Learning from Performance Feedback:
Performance Information, Aspiration Levels and Managerial Priorities

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Abstract

While performance management is increasingly widespread, we still know little about how performance information generates learning and affects organizational responses. Recent work on performance information and learning in private business organizations, however, suggests that perceived negative performance triggers important strategic responses related to problem identification, search, and change. In turn, how performance is perceived depends on whether performance falls short of aspiration levels that are based on an organization's historical performance and the performance of peer organizations. This article adapts this model to a public sector context and tests one implication of the model, namely that public managers will increase their prioritization of goals that are currently performing below aspirations. This is a central question to the study of public organizations pursuing multiple and democratically contested goals. Empirical findings based on administrative performance data and a survey of Danish school principals support this prediction.

Introduction

The supply of performance information has increased vastly in most public sectors and across many different types of public organizations (Moynihan 2008; Bouckaert and Halligan 2008). A central aim behind performance information systems is that systematic and continuous evaluation of organizational performance should be used to improve future performance. By analyzing performance and relating it to existing organizational arrangements, performance information is argued to promote organizational learning and, consequently, improve the quality of organizational decision making (Behn 2003; Moynihan 2008; Moynihan and Landuyt 2009).

For this type of learning to take place, however, decision makers must be informed by the information and use it in decision making. Accordingly, a growing body of work has studied the antecedents of performance information use, and a number of individual, organizational, and environmental factors promoting the use of performance information have been identified (e.g., Van Dooren and Van de Walle 2008; Moynihan and Pandey 2010). Similarly, different individual and organizational characteristics have been linked to whether performance information promotes organizational learning (Askim, Johnsen, and Christophersen 2008; Moynihan 2008; Moynihan and Landuyt 2009). This work constitutes an important endeavour because, as one article states, 'Without knowledge of why such use occurs, it becomes difficult to establish the conditions for performance management success.' (Moynihan and Pandey 2010, p. 850). However, while much work has focused on explaining self-reported levels of performance information use, we still know little about what the specific organizational impacts of performance information are (Moynihan et al. 2011). Thus, measures of performance information use does not tell us *which* particular attitudes and decisions are affected by performance information, nor *how* they are affected by it.

This article takes a novel approach to these questions by introducing an aspiration-based model of performance evaluation inspired by Cyert & March's (1963) *A Behavioral Theory of the Firm*. Following this model, systematic performance evaluation can be understood as a means to ensure organizational adaptation. Accordingly, because high and low performers face different adaptive pressures and learning potentials, we should expect decision makers' responses to performance information to depend on what the information tells them about their performance. Particularly, perceived negative performance signals the existence of a problem requiring attention, which in turn influences different organizational responses in predictable ways (Greve 2003). This article uses this model to examine whether performance information affects how public managers prioritize between organizational goals. Understanding how priorities are formed and change is a pertinent question to the study of public sector organizations, as they are often pursuing multiple and democratically contested goals (Chun and Rainey 2005; Moynihan et al. 2011).

While the model has been applied successfully to explain strategic actions within different private sector industries, it remains almost unexplored in public management research (one notable exception is Salge 2011). With increasing attention to measuring the performance of public organizations, this theoretical framework holds considerable promise in terms of improving our understanding of the impact of public sector performance management systems; and in the process, it can help answer the call of some authors for a stronger theoretical foundation of the academic literature on performance management (Jennings and Haist 2004; Yang and Hsieh 2007; Moynihan et al. 2011).

The following sections describe the model of performance evaluation in greater detail and relate it to how managers prioritize among organizational goals. The article then discusses how the model can be adapted to a public sector context, as public and private sector organizations are known to differ in important respects. Next, the hypotheses derived from the

model are tested using data on Danish public schools. The findings support the predictions and hence suggest increased attention to how performance information affects not only managerial priorities but also other behavioural outcomes.

Theory and Hypotheses

A Behavioural Model of Performance Evaluation

A fundamental assumption within the Carnegie tradition of bounded rationality is that while individuals and organizations are goal-oriented they seldom act as rational optimizers seeking to determine the best possible alternative in the feasible set of alternatives but rather tend to rely on a satisficing heuristic (Simon 1955; March and Simon 1958; Cyert and March 1963). The key notion in this satisficing tradition is that of aspiration-based choice (Simon 1955; Bendor 2010), which is also a familiar concept to other theoretical traditions, including prospect theory (Kahneman and Tversky 1979) and theories of reinforcement learning (Bendor 2010). The logic of these theories is that aspiration levels are fundamental to how choice problems are represented and understood because individuals and organizations anchor their self-evaluations on aspiration levels (Greve 2003). Thus, aspiration levels function as thresholds that partition all possible pay-offs into two (or more) disjoint sets, and they can be defined as 'the smallest outcome that would be deemed satisfactory by the decision maker' (Schneider 1992, p. 1053). While it is debated whether and under what circumstances satisficing leads to optimal or suboptimal outcomes, studies demonstrate that actors in a wide range of different contexts do show signs of satisficing behaviour (Bendor 2010).

Transferring this model of aspiration-based choice to how managers and their organizations interpret performance information, it becomes central how actual performance relates to performance aspirations (Cyert and March 1963). As already March and Simon (1958, p. 4) posited, 'organizations focus on targets and distinguish more sharply between

success (meeting the target) and failure (not meeting the target) than among gradations in either.' When performance feedback shows that performance falls short of aspirations, this provides a signal to the organization that some sort of change is required (Salge 2011). When managers are responsive to performance shortfalls, it is essentially an instance of organizational learning behaviour in which decision makers seek to adapt to environmental signals, internal or external to the organization (Simon 1956; Greve 2003). Such adaptation might arise simply from learning what the organization's real performance potential is or it could reflect political or social norm pressure to meet performance aspirations (Greve 2003).

Reflecting the prediction of organizational satisficing behaviour, a large number of almost exclusively private sector studies have demonstrated that performance feedback affects organizational search and change in a way that depends on aspiration levels, and these findings have been robust across many different private business sectors operating in competitive markets (for a review of this literature, see Greve 2003). The diagnosis that a performance problem exists has been found to increase resources spent on problemistic search for potential solutions to the problem. Conversely, performing above the aspiration level reduces the need for search. Similarly, performance relative to aspirations is argued to affect actors' risk tolerance and, consequently, their willingness to pursue risky organizational change (Greve 1998).

Prioritizing among Competing Goals

The focus of this article is whether performance appraisal affects how managers prioritize between competing organizational goals. Public organizations typically pursue multiple objectives (Wenger, O'Toole, and Meier 2008), some of which relate to measured organizational outcomes while others do not. The concept of a goal variable makes it explicit

that organizational performance as well as aspirations for a specific goal can vary over time and across organizations.

Somewhat surprisingly, the question of goal prioritization has received little attention in empirical studies (Greve 2008). Indeed, the above quote from March and Simon (1958, p. 4) continues, 'organizations devote more attention to activities that are currently operating below their own targets than they do to activities that are achieving their targets.' This resonates well with work on a more general 'negativity bias', whereby negative information is given greater weight than equally strong positive information in a range of different information-processing tasks and decision outcomes (Lau 1982; Hood 2011). Cyert & March (1963) further describe how decision makers deal with goals sequentially in such a way that only one goal at a time is given attention and that moving on to the next goal requires that performance on the first goal satisfies aspirations. The allocation of attention then constitutes an implicit prioritization of goals (Cyert and March 1963). Paying selective attention to goals can therefore also serve as a form of quasi-resolution of goal conflict among decision makers as trade-offs between goals need not be weighed directly against each other. Accordingly, in a study of insurance firms, Greve (2008) finds evidence supporting the expectation that managers pay sequential attention to goals of performance and firm size depending on performance relative to aspirations.

This effect is interesting as it can help us understand not only the types of effects that might arise from performance feedback–such as search, change, or different forms of performance information use–but also their more detailed direction in terms of organizational prioritization among specific goals. Consequences to goal setting and prioritization are particularly central to the study of public organizations as these are often pursuing multiple and democratically contested goals (Moynihan et al. 2011). Thus, while studies of private sector firms tend to focus on economic goal variables such as profits, costs, or growth (Greve

2003), it is generally more difficult to clearly state the goals of public service organizations (Chun and Rainey 2005; Pandey and Wright 2006). Many different kinds of goals might be chosen, including efficiency, service quality, responsiveness, equity, and wider democratic outcomes (Boyne 2002a). Furthermore, most public organizations are deliberately created to pursue multiple goals, some of which might even be partly at odds with one another (Kelman and Friedman 2009). Under such circumstances, performance evaluation can be viewed as a strategy for choosing which among the competing goals to endorse or how to prioritize between them (Wenger, O'Toole, and Meier 2008). With the considerable discretionary powers that most public organizations possess (Brehm and Gates 1997), if performance information affects how goals are prioritized, this could have important democratic and broader distributional consequences.

This, of course, does not mean that organizations can only pursue one goal at any given time. As a routine matter, most organizations simultaneously pursue a variety of different goals (Chun and Rainey 2005; Wenger, O'Toole, and Meier 2008). By letting different subunits function in parallel, the organization as a whole is able to engage in parallel processing of information and goals (Simon 1947). However, when our analytical lens moves upward in the organizational hierarchy, individual managers overseeing the implementation of multiple goals, perhaps through multiple subunits, will be subject to the limits in information processing resulting in sequential allocation of attention, which, at least implicitly, makes the prioritization of goals necessary.

Managerial priorities are rarely identical to how goals are prioritized throughout an organization, as shown in work on implementation problems and the discretion street-level bureaucrats in human service organizations (Brehm and Gates 1997). Nonetheless, managers are often highly important to organizational goal setting, processes, and change (Wenger, O'Toole, and Meier 2008; Meier and O'Toole 2009), and they might affect these through a

variety of different means, including formal orders, incentives, nurturing organizational cultures, allocating resources, and recruiting new personnel (Moynihan, Pandey, and Wright 2012). Therefore, it can have substantial impacts on organizational operations if, indeed, performance feedback affects how managers perceive and prioritize organizational problems and goals.

Public Sector Performance Pressures

In much of the original behavioural work on organizational decision making, the satisficing mechanism was understood as being generic to organizational behaviour (March and Simon 1958). Cyert and March (1963, 197) stated that 'If we view the concepts [of the theory] alone, it is clear that they are not intrinsically unique to the firm. The processes they stipulate are general decision processes.' Nevertheless, a key question to the transferability of the private sector findings is whether goal achievement is less important for public managers compared to private managers and if they therefore choose to ignore performance information. Indeed, public and private organizations are often held to differ on a number of important characteristics related to ownership, funding, and control (Boyne 2002b; Meier and O'Toole 2011). Being embedded in a political system, public organizations often face lower levels of goal clarity and additional operating constraints that might direct attention away from goal achievement and towards coping with conflicting demands and avoiding blame (Moynihan 2008; Hood 2011; Nielsen forthcoming). Focus on goal achievement in public organizations might also be reduced by a relative absence of performance-related incentives. To the extent that such differences exist, this could render the theoretical mechanism less important or even irrelevant for public organizations.

There are, however, compelling reasons to believe that these differences are exaggerated. The efforts to increase the use of performance incentives and quasi-market

mechanisms in public sectors suggest that the approach is also important to understanding organizational behaviour in public organizations. In line with this, Salge (2011), in his study of innovative search behaviour in the British National Health Service, finds evidence of the same theoretical mechanism at work in performance evaluation. For most public organizations, though, competitive pressures and performance-related financial incentives play only a marginal or no role. Also, the bottom-line economic performance indicators available to private business firms will rarely have an obvious public sector equivalent. Nevertheless, the rapid spread of performance information systems marks an increasing attention to how well public organizations perform (Moynihan 2008). Although the presence of performance information cannot be equated with economic market pressures, recent work indicates that performance information increasingly plays a part in the political processes of budgeting and administrative regulation, if perhaps sometimes mainly for advocacy purposes (Melkers and Willoughby 2005; Moynihan 2008; Moynihan and Hawes 2012). Thus, increasing political pressure forces public organizations and their managers to focus on performance. This is also consistent with recent work on the importance of organizational reputation and support (Carpenter and Krause 2012). A very different source of interest in goal achievement might derive from pro-social motivation which appears to be present at greater levels in public than private organizations (Perry and Hondeghem 2008). In line with this, Moynihan and Pandey (2010) also find that public service motivation is positively associated with managers' use of performance information.

The aspiration-based mechanism involved in performance evaluation thus might well be relevant to public organizations more broadly, although this is ultimately an empirical question. But transferring the model still requires some adaptation due to differences in goal setting and how performance aspirations are formed in public organizations compared to private sector businesses.

Performance Information and Aspiration Levels

Because managers have to cope with uncertainty about what their organization's performance could or should be (March 1994; Greve 2008), they are left to form their expectations based on information cues that are available in the environment. Empirical studies show that how private organizations set their aspiration levels depends on an organization's or management's past experiences and other available information on what can reasonably be expected or required of its performance (Greve 2003). This information will often depend on organizational characteristics and context, and therefore aspiration levels are likely to differ across similar types of organizations.

Particularly, studies point to historical information on an organization's own past performance and to social comparison with the performance of relevant other organizations as determinants of performance aspirations (Baum and Lant 2003; Greve 2003). These are referred to as, respectively, *historical aspirations* and *social aspirations*. Thus, with differing aspiration levels two organizations receiving fairly similar information on their own performance might interpret this information in very different ways. If one organization has increased its performance from P_1 to P_2, whereas another organization has dropped from P_3 to P_2, the first organization is likely to interpret this as a success, whereas the second organization will likely perceive the same score as a sign of failure and start searching for ways to improve future performance. Similarly, with two organizations performing at P_2, they might interpret this performance differently depending on whether the organizations they usually compare themselves to perform above or below this point. A third source of aspiration levels can arise from the existence of pre-set performance targets (Boyne and Chen 2007), and these have therefore been termed *coercive aspirations* (Salge 2011). I will return to these in the final discussion.

How reference groups for social comparison are formed in practice is less clear. Private sector studies have pointed to elements of geographic and strategic proximity (Baum and Lant 2003). Geographic proximity is a kind of neighbourhood effect, whereas strategic proximity rests on a more refined selection of comparable organizations based on, for instance, size, industry, market, production methods, or performance (Greve 1998).

In a public sector setting, the relevant information sources that managers can use in setting performance aspirations are likely to differ depending on the type of organization. Some government agencies might be the only one of their kind, or they might have to look to agencies operating in other policy areas or in other countries to find comparable organizations. Public service organizations, in contrast, often have many organizations they can compare themselves to. This is typically the case for organizations such as hospitals, police departments or schools where administrative divisions are often based on geographic criteria (Gulick 1937). For these types of organizations, not only geographic but also strategic proximity will to some extent coincide with such geographically based administrative divisions, which might well make organizations compare themselves to other organizations within the same administrative unit, for instance, within the local or regional government, rather than to some national average. There are more reasons for this. First, this is where information on performance and other characteristics of other organizations is often most readily available to managers and their superiors, perhaps even as elaborate bench-marking schemes or government reports. For the same reason, managers are likely to suspect that their superiors will compare them directly to their other agents performing similar tasks. In some cases, competition for clients between organizations within the administrative unit might be a third factor.

Social aspirations can also be influenced by other factors, and they probably are. For instance, schools might place greater weight on the performance of the schools that resemble

them the most in terms of, for instance, task difficulty, size, or type of location (Greve 1998). Furthermore, this more refined selection of reference groups might take place both within and outside the geographic boundaries of the administrative unit. This underlines that when studying the influence of aspiration levels, substantial knowledge of the empirical case is necessary. Formulated at a more general level, however, because managers pay sequential attention to organizational goals, how they prioritize among different goals is expected to differ systematically depending on organizational performance relative to aspiration levels (Cyert and March 1963; Greve 2008). When distinguishing between historical and social aspirations, this results in the following two hypotheses:

H1. When performance relative to historical aspirations declines on a goal variable, managers' prioritization of that goal will increase.

H2. When performance relative to social aspirations declines on a goal variable, managers' prioritization of that goal will increase.

Before turning to the empirical test, it is worth noting what alternative expectations might look like. First, as noted above goal achievement might not be a sufficiently pressing concern to public managers for performance information to have a detectable impact on managerial priorities, especially when no financial incentives are tied to performance achievements. Second, from a rational perspective, which also assumes information and search costs as well as uncertainty and risk, we should not expect aspiration levels to matter (Simon 1955; Cyert and March 1963). Rather, decision makers should act as optimizers and so, while their performance level might still be an important feedback mechanism, their responses should not be independently influenced by how performance relates to contextually contingent

aspirations (March 1994; Greve 2003). This is particularly evident concerning the somewhat arbitrary nature of historical aspirations that reflect a continuously changing status quo (Kahneman and Tversky 1979). Finally, there might even be an opposite logic at work, according to which managers will focus on those goal variables that show improved and comparatively high performance in order to reinforce positive trends and nurture comparative advantages (Hunt and Morgan 1995). The presented hypotheses are thus far from trivial.

Design and Methods

The hypotheses are tested against data on Danish public schools. Danish schools and their principals are exposed to performance information in the form student exam grades on nationally standardized tests. It is also an area with a large number of 'like units' that lend themselves to comparison as they operate within the same legislative and regulatory framework. The Danish school system is relatively decentralized with multi-purpose municipality governments being in charge of funding and regulating schools locally, but also with considerable discretion remaining at the school level (Andersen and Mortensen 2010), which allows for variation in school organization and priorities. Although academic learning stands out as the most important goal, schools still have to prioritize among multiple goals competing for attention (Andersen 2008). Some of these are legislative requirements, including ensuring that students receive academic abilities, a democratic understanding and spirit, and support of the all-round development of the individual student (Public School Act 1993, §1). More goals, such as developing students' social skills, physical fitness, or creative abilities, might enter the process through different stakeholders trying to exert their influence at the local level.

Data and Measures

The data consist of a survey of Danish school principals from 2004 combined with administrative panel data on Danish public school performance as well as a number of municipal, school, and student controls, including highly detailed information on student socio-economic background. From a total of 1,055 relevant public schools, the sample was narrowed to include only schools from which at least 10 students had taken the final ninth grade exams in both Math and Danish in 2002 and 2003. The general survey response rate was 71% but with some additional missing answers, resulting in a final dataset of 490 schools with performance measured in 2002 and 2003, potentially affecting school principals' survey answers in 2004.

Performance relative to performance aspirations

Performance is measured as the school grade point average on two nationally standardized written tests in Mathematics and Danish at the exit level, when students are usually 15–16 years old. More than 98 percent of the students took these tests (Andersen 2008), which underlines their quality as comparable performance indicators. These grade point averages were not publicized or reported by news media and were primarily used internally by the local municipality governments and school principals to track school performance. On a formal grade scale from 0 to 13 (though effectively rather from 3 to 11), Table 1 shows that the average student performance of different schools varied substantially.

Historical aspiration levels are based on the past performance of an organization. Because performance data are unavailable from before 2002, I follow existing studies in making the simplifying assumption that historical aspirations are based only on performance in the previous year (Greve 2003). Should this result in measurement error it would mainly serve to attenuate any significant findings. Performance relative to historical aspirations is

therefore measured as present performance minus last year's performance. Taking into account that the size of changes might be perceived differently depending on a school's starting level the final variable was constructed as $(P_{s,t} - P_{s,t-1}) / P_{s,t-1}$, where $P_{s,t}$ is the performance of school *s* at time *t*. This variable therefore measures the relative or percentage change in school performance from year to year.

[TABLE 1 AROUND HERE]

Constructing a measure of the social aspiration level is less straightforward, as social comparison can be based on many different criteria. When conducting empirical studies knowledge of the empirical case as well as simplification are therefore necessary tools. As discussed above, the primary criteria for selection of reference organizations concern geographic and strategic proximity. Schools are one type of organization where these two criteria are likely to overlap with geographically based administrative divisions. In the Danish case, schools are the agents of multi-purpose municipalities. Municipality governments provide goals and funding for their schools. They also have formal influence over different aspects of how the schools are organized and allocate funds internally, and they oversee the implementation of national legislation. Given the importance of municipality governments to Danish schools, school principals and their superiors will more likely compare themselves primarily with other schools within the same municipality, rather than relying on a simple national average or undertaking the elaborate task of locating which among the more than 1,000 public schools in Denmark that are most comparable. Given the geographic proximity, this is typically also where information on the performance, task difficulty and other characteristics of schools are more accessible to school principals and their superiors. To a

limited extent, Danish schools also compete for students, which is likely to make school principals place greater emphasis on the performance of their direct competitors.

The social aspiration level is therefore measured as the grade point average on the two standardized tests among all public schools located in the same municipality. The variable measuring performance relative to aspirations is constructed by subtracting the municipal average from the school average and then measuring the relative or percentage difference calculated by $(P_{s,t} - P_{m,t}) / P_{s,t}$, where $P_{m,t}$ is the average performance in municipality *m* at time *t*. This requires that there are other schools in the same municipality. If no performance data exist for other schools in the same municipality, the schools are left out of the analyses. As the descriptive statistics in Table 1 show, the variables measuring performance relative to the historical and social aspiration levels have means close to zero, which is to be expected given how they are constructed, but also that schools vary significantly around the mean value. As previously mentioned, social aspirations can also be influenced by other factors (Greve 1998). While the existence of additional factors might conceal the true effects of social aspirations in this study, it primarily suggests that the statistical test might produce downward biased estimates.

It is worth noticing that neither type of performance aspiration is measured directly. Instead, both measures assume that principals are aware of their historical performance and the performance of other schools and use this information to form aspirations. If they do not, neither measure should have any explanatory power.

Managerial priorities

The dependent variable measures how school principals prioritize the goal of academic achievement. While formally it is primarily the prerogative of municipality governments to prioritize between goal variables, part of this authority is delegated to school principals by

law or choice, and considerable discretion allows school principals' priorities to further influence school operations. The data contain two items related to fundamental pedagogical choices or educational philosophies that can be linked to this goal. The additive index of managerial priorities was created from the following two Likert-scaled items: 'The use of subject-specialized teachers is more important than classes having as few teachers as possible' and 'Focus on the subject is more important than focus on the student.' Principals' attitudes toward these statements are here interpreted as key implementation choices that reflect how much emphasis principals place on academic achievement compared to other non-academic aspects.

For both items, the first part of the statements ('subject-specialized teachers' and 'focus on the subject') implies a relatively clear focus on academic learning. How to interpret the last part ('few teachers' and 'focus on the student') is less straight-forward, however, as either of these strategies could be chosen based on different priorities, including academic learning. Nonetheless, neither expression refers explicitly to academic learning, and respondents are therefore likely to interpret it more broadly, that is, as including aspects related to, for instance, student welfare and all-round development, which have traditionally been other highly salient goals for Danish public schools. Second, the item formulations force respondents to choose between the two poles, so because 'student focus' is the vaguer term, when respondents lean toward 'focus on the subject' this indicates a prioritization of academic learning. In addition to this, a recent report from the Danish National Centre for Social Research finds that teacher strategies focused on official goals of the subject as opposed to a student-centered teaching style are positively correlated with students' academic performance, thus indicating that the items do reflect the prioritization of academic learning (Andersen 2013).

Despite these considerations, some caution is warranted when interpreting the results, especially in the case of null findings, as these can be caused by measurement error. Conversely, if the hypotheses are confirmed this would corroborate the validity of the measure or, at least, show an impact on the educational philosophies of the school principals. The two items are highly significantly correlated whether they are analyzed as interval scaled ($r=0.25$) or ordinal scaled ($\gamma=0.30$), which is another indication of the systematic variation in the items. Both items have an acceptable distribution of answers. Although less than 6 percent of the principals answer "agree" or "partially agree" to the second item, the answers are well distributed on the three remaining categories. The index should primarily be interpreted as ranging from high to low priority of academic learning. Thus, the index does not directly measure the relative prioritization of academic learning compared to other goal variables. Nevertheless, because the two index items explicitly involve trade-offs between different aspects they give an indication of the relative weight given to academic learning compared to non-academic aspects. Also, to the extent that real-world priorities have to be traded off against each other (Cyert and March 1963; Wenger, O'Toole, and Meier 2008), the prioritization of academic learning might crowd out other aspects.

Controls

The analyses include a number of control variables, shown in Table 1, in order to reduce error variance and control for any confounders that might affect both managerial priorities and performance relative to aspirations. Three variables are of particular importance. The number of other public schools in the municipality might affect the reliability of social comparison within the municipality, and it might also impact managerial priorities in different ways, particularly through the level of competition for students and funding. Another potentially important characteristic to control for is the level of performance focus. This concerns

whether schools, besides receiving measures of performance, also use systematic tools to gather, analyse, and evaluate performance information, which could systematically affect both managerial priorities and the development of school performance over time and relative to other schools. This variable is measured by an additive index of four survey items probing whether and for how long schools have used 'written goals', 'written evaluation or feedback on achieved results', 'quality development', and 'management by objectives'. Based on the number of years these have been employed, each item was coded 0–4. A third important control is the municipalities' school expenditure per student as this helps account for any heterogeneity in the priorities of municipality governments. The controls also cover a number of other municipality and school level variables as well as several aggregated variables of student socio-economic back-ground characteristics to control for task difficulty. The student variables are based on anonymized and confidential administrative data accessed via the independent government institution Statistics Denmark, thus rendering them highly reliable.

Estimation Strategy

In the statistical models presented below, the measure of managerial priorities is regressed on performance relative to aspirations. Taking into account the presence of explanatory variables at both the school and municipality level, the correlations are estimated using random-intercept multilevel models. As it turns out, similar OLS models produce almost identical estimates and p-values. Apart from the survey-based measures of managerial priorities and performance focus, all variables were measured in early summer 2003, at the time of the last round of student exams before the survey was administered around April 2004. Therefore, impacts on managerial priorities must persist for almost a year to show up in the statistical tests, which will underline the importance of any positive findings. Another strength of the data is that while the dependent variable is measured in the school principal survey, the two

main explanatory variables are based on administrative data, thus avoiding issues of common source bias, which are often present in survey-based studies of organizational behaviour and attitudes (Meier and O'Toole 2013).

All models control for the level of school performance. This is essential to ensure that the measures of performance relative to aspirations do not become proxies for the level of absolute school performance that was used to construct them. By controlling for school performance, both measures of relative performance measure only the deviation in performance from the aspiration level. The estimates for school performance are of little interest to this study, as past levels of academic achievement focus might affect both present academic achievement focus and school performance.

Despite the use of control variables to adjust for any selection effects that might create biased results, there might still be issues concerning the direction of causality. However, it appears somewhat counter-intuitive that previously having given high priority to academic achievement should result in future low relative performance. One might suspect that prior prioritizing of academic achievement will rather be positively correlated with performance relative to aspirations, which is the opposite of the hypothesized relationship. Thus, while the risks associated with systematic selection effects cannot be ruled out, it does not appear to be major problem.

Findings

The left-hand side of Table 2 presents the random-intercept estimates. The two variables measuring performance relative to, respectively, historical aspirations and social aspirations show similar patterns. In the first model controlling only for school performance, both variables are statistically significant only in a one-tailed test, whereas they become statistically significant at the 0.05 level when the remaining controls are included. These

results thus support both Hypotheses 1 and 2, as increasing performance relative to aspirations appears to result in lower prioritization of academic achievement. Or conversely, that decreasing performance relative to social aspirations appears to result in higher prioritization of academic achievement.

Comparing the sizes of the two coefficients, the social aspirations coefficient is around twice the size of the coefficient for historical aspirations. Some caution is warranted in this comparison, however, as the variables differ in their distributions around the aspiration level (i.e. when they take on the value '0'), as shown in Table 1. Standardized beta-coefficients show that the estimated effect of performance relative to social aspirations is around 1.6 times larger than the estimated effect of performance relative to historical aspirations.

[TABLE 2 AROUND HERE]

When assessing the more general relevance of aspiration levels to our understanding of performance information effects, it is important to document more than just trivial effects that might be dominated by other factors. Additional analyses show that neither of the two aspiration levels change much in coefficient size when the other is introduced as a control. This indicates that they have separate impacts on managerial priorities and therefore both should be included when gauging the effect of performance relative to aspirations. By adding the two estimates from the controlled model, the estimate obtained of their combined effect is just under 0.1. When comparing this to the distributions of the explanatory and dependent variables presented in Table 1, this amounts to a substantial effect. The index of managerial priorities has a range of 0–8, but a standard deviation of only 1.54, so with ranges in the two independent variables of around 40, the potential effects are far from trivial. Using standardized beta-coefficients (not reported in the table), one standard deviation change in

performance relative to aspirations corresponds to a change in managerial priorities of 0.28 standard deviation.

It should also be borne in mind that the measures of the aspiration levels used in this study were likely based on only a subset of the factors that jointly determine managers' performance aspirations. For instance, historical aspirations might in practice be based on a more complex weighting of the performance of multiple years, and social aspirations will likely be particularly influenced by comparison with organizations that share specific characteristics beyond being located within the same municipality. Hence, the actual effect of performance relative to aspirations on managerial priorities might be greater than that estimated here.

To test for any municipality-level heterogeneity that might affect these results, random and fixed effects estimates were compared using the Hausman test. However, because 81 of the 197 municipalities had only one school represented in the full sample, these are automatically excluded from this comparison, as the fixed effects models absorb all between-municipality variation. The right-hand side of Table 2 therefore report the results from this reduced sample. As shown at the bottom of the table, Hausman tests of both the controlled and uncontrolled models reveal no significant differences between the random and fixed effects estimates, suggesting that municipality-level heterogeneity is not a problem. The size and direction of the reduced sample random effects coefficients are fairly similar to those for the full sample, though slightly smaller. The consistent fixed effects estimates, on the other hand, are considerably larger, especially for social aspirations, indicating that the random effects models might produce slightly downward biased estimates. Unsurprisingly, the reduced sample consistently produces larger standard errors. Thus, the estimates for historical aspirations move around the 0.05 significance threshold, while the social aspirations coefficients become insignificant. While this reduced sample comparison does not provide a

complete test of municipality-level heterogeneity in the full sample, it does suggest its absence. This is also indicated by Likelihood-ratio tests showing that there is no significant municipality-level heterogeneity in managerial priorities, which also the random effects variance estimates for both samples show. Finally, any remaining heterogeneity might be picked up by the rather detailed school and municipality-level controls.

Discussion

The findings of this study show that the school principals studied here are responsive to their organization's level of performance. The results furthermore demonstrate that principals' responses to performance information appear to depend on how their performance relates to aspiration levels that are based on historical and social comparison. Bearing in mind that some issues of selection effects might persist, this indicates that performance-based organizational adaptation follows an aspiration-based logic of satisficing (Kahneman and Tversky 1979; Greve 2003). This shows the importance of the assumptions we make about how actors process and understand information.

The findings are also important to previous work showing that managers only make limited use of performance information in decision making. These findings have prompted a growing literature studying the antecedents of performance information use. This article adds two new perspectives to this issue. First, by demonstrating the impact on how managers prioritize organizational goals, performance information can have an important indirect effect on a host of different managerial decisions relating to, for instance, organizational goal setting, goal clarity, incentive systems, resource allocation, or recruitment patterns (Meier and O'Toole 2009; Moynihan, Pandey, and Wright 2012). Such indirect effects might not be captured when managers are asked directly about their purposeful use of performance information in decision making (Moynihan and Pandey 2010). Second, according to

traditional theories of learning, we cannot expect performance information to influence organizational decision making independently of how well an organization performs (Greve 2003). If aspiration levels are crucial to how managers perceive and react to feedback on organizational performance, organizations performing above their aspiration level are likely to prefer the status quo. This kind of non-decision can also be an effect of performance information, but one that might not show up in survey-based studies of performance information use.

The findings also prompt more general questions about how the introduction of performance management reforms affects the behaviour of public managers. Based on the findings in this article, the increased focus on performance and performance feedback inherent in these management systems suggests that reformed organizations will be more adaptive to environmental performance pressures than more distinctly process-driven organizations. But the patterns of aspiration-based responses also indicate that adaptive behaviour is not linear. While satisficing is an important heuristic in promoting organizational adaptation (Bendor 2010), it can have unfortunate consequences as well. If an organization performs below its aspiration level, risky organizational changes might be introduced even if increased risk-taking is unfounded according to its expected pay-off. Conversely, organizations performing above their aspiration level might neglect to conduct the innovative search or introduce the organizational changes necessary to sustain long-term performance, a phenomenon also known as the ‘competence trap’ (March 1994).

These potentially asymmetric reactions to performance feedback also show the necessity of designing and managing performance information properly. It confirms the importance of creating high quality performance information, both in terms of what to measure and the precision of measurement (Moynihan et al. 2011). Concerning the precision of measurement, inaccuracies due to measurement error or failing to take into account the

level of task difficulty could be what moves an organization above or below its aspiration level with the different implications this can have for future organizational behaviour. As this study illustrates, also the choice of goal variables on which to measure (and not measure) performance can influence how managers prioritize between goals. This is not a new proposition (Kelman and Friedman 2009). But if the kind of sequential attention pattern predicted by Cyert & March (1963) is present, the satisficing mechanism would suggest that managers might fail to attend to other important goals until they succeed in satisficing on the primary goal variable.

The satisficing perspective highlights another potentially important issue, namely the managing of aspiration levels. This is a tricky question, particularly for historical aspirations as they change from one time period to the next depending on experience. As March (1994, 22) puts it, 'if aspirations adapt to experience, then success contains the seeds of failure, and failure contains the seeds of success.' Hence, it is not obvious that organizations will benefit from the adaptive pressures associated with performance relative to historical aspirations.

Concerning socially based aspirations, controlled benchmarking systems or league tables based on organizational characteristics might improve on managers' perceptions of what should be expected of their organization's performance (Dixon, Hood, and Jones 2008). It is interesting to note that in this study managers were sensitive to a measure of average municipal performance, whereas often policy makers emphasize the spread of best-practice. Managing of aspirations is therefore also an important element in organizational learning. A particular tool primarily available in the public sector is the use of pre-set performance targets (Boyne and Chen 2007), sometimes referred to as coercive aspirations (Salge 2011). Existing debates have, among other aspects, focused on the credibility of performance targets and risks of gaming behaviour (Kelman and Friedman 2009). Particularly relevant to performance aspirations, 'threshold effects' describe incentives for both those performing below and above

the target to move towards the standard, whereas 'ratched effects' refer to gaming by not exceeding targets too much, as future performance targets will often be based on past performance (Bevan and Hood 2006), much along the lines of that described above for historical aspirations. Future debates on performance targets might also benefit from taking into account the more general dynamics associated with aspiration-based adaptation that are described in this article.

Conclusion

The study of organizational learning from performance information in the public sector can fruitfully benefit from making explicit use of behavioural models of information processing. Such models focus on the reported level of performance and the knowledge this conveys to decision makers about their organization. Importantly, they also model the impact of contextually determined aspiration levels used to evaluate whether performance is perceived as high or low, satisfactory or requiring an organizational response. This study contributes by showing how such models can be adapted to the study of public organizations, and it demonstrates that performance relative to aspiration levels appear to have an impact on how Danish school principals prioritize among goals.

Nonetheless, the prospects for whether performance management can fulfil its promise as a source of organizational learning supporting subsequent performance improvements are not entirely clear-cut. Because the satisficing perspective marks a departure from optimizing, one might be pessimistic about this. But optimism is also warranted given that performance information does in fact seem to further the adaptive behaviour of at least some public organizations. What remains clear is that how performance management systems are managed is still important.

Our understanding of how performance feedback is interpreted and acted on in a public sector setting is still only in its beginning stages. Future research should explore whether the behavioural approach is applicable to how other types of public organizations react to performance information. School organizations are important in their own right as central parts of modern welfare states, but they are also characterized by having relatively easily quantifiable performance indicators compared to many other public service organizations. While they are pursuing multiple goals, schools in addition have a fairly unambiguous goal hierarchy with academic learning serving as the most important goal. It is therefore unclear whether performance feedback on less salient goal variables will have similar effects on goal priorities. These characteristics thus limit the generalizability of the findings. Conversely, the absence of direct financial incentives and weak regulatory consequences associated with performance levels in Danish public schools would suggest that the aspiration-based model of performance evaluation might be more important in high-stakes performance management settings, in which performance cannot be ignored, as also the existing private sector findings indicate.

Future studies should also consider other more specific organizational responses to performance information, as the impact of managerial priorities and subsequent management decisions on organizational operations can be limited by implementation challenges (Brehm and Gates 1997). Other organizational responses include search patterns and organizational change but also how these manifest themselves more specifically in organizational design, practices, and decision making. A behavioural approach to studying performance management and performance information therefore holds considerable promise as a new and fruitful direction of research into public administration.

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TABLE 1 *Descriptive statistics*

	N	Mean	Std. Dev.	Minimum	Maximum
Managerial Priorities	490	3.182	1.574	0	8
Performance - Hist. Aspirations (%)	490	0.737	5.724	-13.45	28.95
Performance - Social Aspirations (%)	490	-0.318	4.535	-26.46	13.10
Performance (School Average)	490	7.922	0.410	6.273	9.140
Controls					
No. Public Schools in Municipality	490	15.00	21.52	2	91
Performance Focus	490	6.778	3.359	0	15
School Size (No. Students)	490	466.9	147.9	137	914
Parents' Average SES	490	2.403	0.385	1.059	3.405
Proportion Girls	490	0.490	0.103	0.182	0.857
Proportion Immigrants	490	0.079	0.140	0	1
Prop. Parents with Upper Secondary	490	0.487	0.137	0.056	0.889
Prop. Parents with Short Higher Education	490	0.060	0.046	0	0.25
Prop. 1 Parent with Medium or Long Higher Education	490	0.205	0.090	0	0.586
Prop. both Parents with Medium or Long Higher Education	490	0.121	0.113	0	.7
Proportion Living with both Parents	490	0.726	0.104	0.28	1
Parents' Average Gross Income (1,000,000 Dkr)	490	0.584	0.113	0.298	1.264
Parents' Average Capital (1,000,000 Dkr)	490	0.350	0.492	-1.890	6.876
Inhabitants (10,000)	490	7.083	11.57	0.419	50.05
Taxation Base (10,000)	490	129.2	8.383	119.6	168.1
Capital	490	0.069	0.254	0	1
Capital Suburb	490	0.153	0.360	0	1
City>100,000 Inhabitants	490	0.114	0.318	0	1
City>10,000 Inhabitants	490	0.276	0.447	0	1
Public School Expenditure per Student	490	46190	4596	36873	62432
Proportion of Students in Private Schools	490	11.99	6.194	0.1	33.6

TABLE 2 *Random Effects (RE) and Fixed Effects (FE) Regression Estimates for Managerial Priorities*

	Full Sample		*Reduced Sample*				
	[RE]	[RE]	[RE]	[RE]	[RE]	[FE]	[FE]
Performance - Hist. Aspirations (%)	-0.0235*	-0.0304**	-0.0229*	-0.0303**	-0.0284*	-0.0404**	-0.0335*
	(0.0134)	(0.0141)	(0.0138)	(0.0146)	(0.0145)	(0.0174)	(0.0187)
Performance - Social Aspirations (%)	-0.0483*	-0.0601**	-0.0333	-0.0395	-0.0411	-0.414**	-0.289
	(0.0271)	(0.0293)	(0.0302)	(0.0303)	(0.0334)	(0.209)	(0.238)
School and (aggregated) Student Controls:							
Performance (School Average)	1.253***	1.708***	1.181***	1.624***	1.558***	6.247**	4.586
	(0.307)	(0.387)	(0.336)	(0.404)	(0.432)	(2.757)	(3.134)
Performance Focus		-0.0223		-0.0222	-0.0185		-0.0292
		(0.0289)		(0.0225)	(0.0236)		(0.0281)
School Size (No. Students) (100)		0.0496		0.0516	0.0574		0.0213
		(0.0559)		(0.0567)	(0.0622)		(0.0753)
Parents' Average SES		0.680		1.064	1.121		1.557
		(0.778)		(0.792)	(0.853)		(1.052)
Proportion Girls		0.463		0.118	0.162		1.053
		(0.681)		(0.741)	(0.760)		(0.884)
Proportion Immigrants		0.854		1.183	1.789		1.277
		(1.173)		(1.045)	(1.288)		(1.562)
Prop. Parents with Upper Secondary		-0.973		-1.289	-1.092		-0.602
		(1.080)		(1.175)	(1.219)		(1.494)
Prop. Parents with Short Higher Education		-1.119		-1.902	-1.541		-2.439
		(2.022)		(2.147)	(2.308)		(2.715)
Prop. 1 Parent with Medium or Long Higher Education		-3.103**		-3.480**	-3.472**		-4.476**
		(1.448)		(1.493)	(1.586)		(1.911)
Prop. both Parents with Medium or Long Higher Education		-1.657		-2.590	-2.008		-1.238
		(1.655)		(1.688)	(1.849)		(2.344)
Proportion Living with both Parents		0.222		-0.0886	-0.459		-1.298
		(1.047)		(1.010)	(1.155)		(1.441)
Parents' Average Gross Income (1,000,000 Dkr)		-1.397		-2.848**	-1.726		-2.589
		(1.460)		(1.329)	(1.559)		(1.884)
Parents' Average Capital (1,000,000 Dkr)		0.349**		0.420***	0.464***		0.507***
		(0.161)		(0.161)	(0.168)		(0.189)
Municipality Controls							
No. Public Schools in Municipality		-0.0235			-0.0149		
		(0.0537)			(0.0568)		
No. of Inhabitants (10,000)		0.0415			0.0256		
		(0.100)			(0.106)		
Taxation Base (10,000 Dkr)		-0.0396**			-0.0393**		
		(0.0166)			(0.0189)		
Capital		0.186			0.182		
		(0.630)			(0.671)		
Capital Suburb		0.475			0.437		
		(0.334)			(0.373)		
City>100,000 Inhabitants		-0.340			-0.332		
		(0.437)			(0.459)		
City>10,000 Inhabitants		0.0680			0.154		
		(0.205)			(0.232)		
Public School Expenditure per Student (10,000 Dkr)		0.115			0.0860		
		(0.210)			(0.239)		
Proportion of Students in Private Schools		0.0105			0.00352		
		(0.0156)			(0.0193)		
Constant	-6.734***	-5.993	-6.230**	-9.184***	-4.911	-46.50**	-33.77
	(2.435)	(3.570)	(2.671)	(3.058)	(4.030)	(21.92)	(24.68)
Residual Variance (RE)							
Municipality Level	0.029	0.000	0.0077	0.000	0.000		
	(0.087)	(0.000)	(0.084)	(0.000)	(0.000)		
School Level	2.332***	2.220***	2.285***	2.184***	2.139***		
	(0.170)	(0.142)	(0.180)	(0.153)	(0.150)		
Log-restricted likelihood	-914.32	-926.81	-750.01	-740.07	-735.87		
Hausman Test (FE vs. RE; χ^2[p-value])			4.49 [0.21]	19.0 [0.21]	17.0 [0.26]		
N (Municipalities)	197	197	116	116	116	116	116
N (Schools)	490	490	409	409	409	409	409

Note: Standard errors in parentheses. Two-tailed tests of significance. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.