Journal of Behavioral
Public Administration
Vol 8, pp. 1-14
DOI: 10.30636/jbpa.81.363

Research Article

# Client Characteristics, Performance Information, and Street-Level Bureaucrats' Willingness to Collaborate

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**Abstract:** Prior research shows that the framing of performance data can influence the interpretation of identical performance results. This study adds to this line of research by testing how performance information and clients' social status and behavior interact to shape street-level bureaucrats' problem identification and willingness to collaborate in public service provision. We hypothesize that in a situation where a client has negative performance results alongside a disadvantaged social status, street-level bureaucrats perceive the client to have a more substantial problem than if the client has an advantageous background. This problem identification is expected to be accompanied by an increase in street-level bureaucrats' willingness to collaborate with colleagues to support the client. Based on a survey experiment among 794 Danish public schoolteachers, we find that although teachers do consider client characteristics when interpreting performance data, information about performance decline or improvement appears more decisive. We discuss the implications of these findings for the literature on performance information use.

**Keywords**: Performance data, street-level bureaucrats, social status and behavior, collaboration; survey experiment

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Many public organizations rely on performance data to inform decision-making among politicians, stakeholders, managers, and street-level bureaucrats. While many studies illustrate that data can be used to initiate effective organizational change (Andersen & Nielsen, 2020; Rockoff et al., 2012; Holm, 2018), another well-documented finding is that ambiguity poses a substantial challenge to this process (Bjørnholt et al., 2022; Holm, 2017; Mikkelsen et al., 2021; Rutherford et al., 2020; Olsen, 2017; Baekgaard et al., 2019; George et al., 2019).

The growing body of literature on the role of ambiguity in performance data use primarily explores factors related to the presentation of data. This line of research has revealed that framing and reference points significantly affect how identical performance results are evaluated by different actors (Olsen, 2017a; Olsen, 2017b; Hvidman, 2020; Holm, 2017). However, the predominant focus on data presentation has left a gap in our understanding of how other factors such as client characteristics influence street-level bureaucrats' interpretation and subsequent response to performance information. To address this call, our study explores the interaction between performance information and another important cue in street-level bureaucrats' decision-making: the client's social status and behavior (Lipsky, 1980; Maynard-Moody & Musheno, 2003).

We argue that street-level bureaucrats integrate the two cues about a client's situation in an additive manner, thereby perceiving a client to have the most profound problem and subsequent need for help when data indicates a decline in performance, and the client has low social status. This hypothesis is tested in relation to street-level bureaucrats' identification of clients' problems and to their willingness to participate in collaborative team efforts aimed at assisting the client. Our emphasis on collegial support is motivated by the fundamental idea in public administration that collaboration among street-level bureaucrats reduces insecurity

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in decision-making by deliberating, bridging, and sharing responsibilities and knowledge, ultimately improving service quality (Foldy & Buckley, 2010; Harrits & Møller, 2014; Møller, 2021).

Our study makes three contributions to the literature on data use among street-level bureaucrats. First, our theoretical framework represents a novel effort to bridge the gap between the literature on performance data use (e.g., Moynihan, 2008; Holm, 2018; Bjørnholt et al., 2022) and seminal work on street-level bureaucrats' decision making behavior (Lipsky, 1980).. Second, our research relates to existing studies on how street-level bureaucrats tend to discriminate against clients with low social status and behavior in performance management systems (e.g., Brodkin, 2011; Soss et al., 2011; Jilke & Tummers, 2018). We explore whether street-level bureaucrats treat clients with the same objective need for assistance (as indicated by their performance results) differently based on their social status. Third, our study connects the utilization of performance data and subsequent problem-solving behavior to the growing research interest in public administration concerning when and how street-level bureaucrats collaborate to address complex public service provision cases in areas such as education, healthcare, and social assistance (e.g., Meads et al., 2008; Schot et al., 2020).

## Theory

The literature on performance data has been increasingly preoccupied with the question of how street-level bureaucrats use performance data (Döring & Jilke 2023; Jacobsen et al., 2018; Kroll, 2015; Mikkelsen et al., 2022; Petersen, 2020). Street-level bureaucrats have at least three roles in relation to performance data. First, their specialized knowledge and insights provide invaluable input to interpret performance results and identify what to do to improve performance (Moynihan et al., 2020). Second, and related, they are implementers of change initiatives in organizations and therefore responsible for creating improvement in instances of problematic performance results (Brodkin, 2011; Harrits & Møller, 2014; Tummers & Bekkers, 2014; Lipsky, 1980). Third, in performance management systems where data is provided for each individual client, they are the primary actors in terms of using the data to – individually and collectively – improve performance. The following sections focus on how street-level bureaucrats react to such data, and how this may influence their problem-solving behavior, i.e., their willingness to collaborate with peers to help the client.

### *Problem-Driven Data Use*

Two generic points from the literature on performance data use underpin our argument about how street-level bureaucrats react to performance data. First, a growing literature illustrates that the use of performance data in the public sector is driven by a problem-solving logic (Andersen & Nielsen, 2020; Petersen, 2020). Concerning street-level bureaucrats, using problem-oriented data would lead to a focus on identifying clients who require additional support. Second, what constitutes "a problem" is context dependent. Numerous studies highlight the influence of contextual information on how identical performance data is assessed (Olsen, 2017a; Olsen, 2017b; Hvidman, 2020; Holm, 2017). Consider the scenario where school principals are tasked with evaluating a school with a GPA of 7.5. When the principals are informed that the school achieved a GPA of 8 the previous year, their perception of performance tends to be more negative than in cases where such information is absent. This shift in evaluation can be attributed to the inherent human inclination to utilize contextual cues as reference points, aiding in the interpretative task by providing a basis for comparison. Reference points thereby serve as benchmarks that give meaning to raw absolute numbers, enabling individuals to gauge whether a number is high or low, better or worse, and whether it meets or defies their expectations. One approach to identifying a problem is to use a historical reference point (Cyert & March, 1963). With the use of this standard, a "problem" occurs when performance declines over time, and "success" occurs when performance increases. However, reference points are only one potential cue for making sense of performance data and for identifying the cognitive biases street level bureaucrats perceptions and use of information (James et al 2020). In the following, we add to this literature by noting the importance of a client's social status.

### *Social Status and Behavior as a Cue*

To understand why street-level bureaucrats might use a client's social status and behavior when evaluating performance data, it is first necessary to describe their work environment. An essential aspect is that these public employees are frequently guided by an intrinsic motivation to aid others and create a positive impact on individuals and society at large (Kjeldsen & Jacobsen, 2013; Perry & Wise, 1990; Wright & Pandey, 2010). However, an unceasing demand for services and limited resources to distribute among clients (Lipsky, 1980) force street-level bureaucrats to employ coping strategies (Tummers et al., 2015). One coping strategy is to categorize some clients as more "deserving" than others based on their past efforts, performance, and/or personal attributes (Jilke & Trummers, 2018). A salient cue about deservingness is a client's social status, i.e., their position in the socioeconomic status hierarchy in a society, which is determined by a combination of social and economic factors such as income, wealth, extent and kind of education, type and prestige of occupation, place of residence, and family background.[1] While former contributions have focused on status cues like gender and race (Jilke & Tummers, 2018), we apply a broader perspective on the social categorization of clients including both their family background and their social behavior (Møller & Harrits, 2013).

The literature on street-level bureaucrats often finds that a disadvantaged social background leads to a higher service level, as a way of compensating for clients' low ability to coproduce in the service delivery. Client with low social status and behavior are perceived to be more at risk because of weak parenting and inappropriate behavior due to low social skills and insufficient codes of good and bad behavior (Møller & Harrits, 2013). This low social status and behavior client attribution legitimizes a need for interventions toward this particular group and they are therefore more likely to receive extra attention and help (Jilke & Tummers, 2018). However, a growing literature on discrimination also finds that street-level bureaucrats unjustifiably treat minority groups differently than majority groups. For example, bureaucrats have in some cases restricted access to elementary and high schools for immigrant children. One explanation for the different findings in relation to the role of clients' social background is that work pressure moderates the relationship. Stressful contexts seem to increase street-level bureaucrats' tendency to react negatively to clients with few resources. Soss et al. (2011) found that performance management systems induced financial pressure on caseworkers and increased sanction rates for minority clients.

However, another coping strategy is to give priority to clients who have a good chance of performing well as a way of 'creaming'. That is, street level bureaucrats prioritize those clients who seem most likely to succeed (Baviskar, 2019, p. 524). One explanation for this behavior is the rational prioritization of scarce resource to clients who has a higher chance of succeeding (Wright, Moynihan & Pandey 2012). Moreover, a high performance score may signalize that a client is motivated for changes and street-level bureaucrats therefore evaluate them as more deserving (Jilke & Tummers, 2018).

### *An Additive Assessment*

We expect street-level bureaucrats to make an additive problem evaluation, meaning that they add/subtract different signals from each other when assessing their clients' need for support. If street-level bureaucrats connect social status to a degree of deservingness, as prior evidence suggests, they should perceive clients with a disadvantaged social status and behavior as having a particularly pronounced problem, as they have few(er) resources to bring to the interaction. This expectation is in line with research showing that street-level bureaucrats use a standard of normality when assessing client risks including assessments of both the family background and the social behavior of clients (Harrits & Møller, 2013). Accordingly, clients who deviate negatively from normality due to their social status and behavior are perceived as being more at risk, which, in turn, influences street level bureaucrats' overall perception of them. Contrary, street level bureaucrats can perceive clients with advantaged social as more likely to succeed since they are more motivated and have more resources to improve due to parental support and attention (Jilke & Tummers, 2018). When connecting this point to a situation where the historical reference point indicates either a problem (by a performance decline) or no problem (by a performance improvement), the following 2×2 table should underpin street-level bureaucrats' problem assessment.

**Table 1: The Interaction of Cues on Clients' Performance and Social Status**

| | Disadvantaged social status | Advantaged social status |
|---|---|---|
| Performance decline | Serious client problem | Average client problem |
| Performance improvement | Average client problem | Minor client problem |

Formally, we test this theoretical idea through the following two hypotheses, which compare the columns (within a row) to each other:

H1: Street-level bureaucrats will perceive their client as having a more pronounced problem when the client experiences performance decline and has a disadvantaged social status and behavior (compared to a client with an advantageous social status).

H2: Street-level bureaucrats will perceive their client as having a less pronounced problem when the client experiences performance progression and has an advantageous social status and behavior (compared to a client with a disadvantaged social status and behavior).

### *Collaboration as Problem Solving*

The second part of using performance data is to identify solutions to the problem. In line with this, a growing number of studies show that public employees tend to use performance data by correcting negative results (Holm, 2018; Andersen & Nielsen, 2020). One possible approach to problem solving is to engage in a formative process with colleagues, often organized in learning forums where collegial input guides the interpretation of data and following decision-making (Moynihan, 2005). Professional collaboration and deliberations are increasingly recognized as important practices of street-level bureaucratic in order improve public performance handle (Møller, 2021; van der Meer, 2023) and data driven collaborative dialogues among street-level bureaucratic are core dimensions of de-privatized practice and reflective dialogue in professional learning communities (Stoll et al, 2006; Vescio et al, 2008). Such professional learning communities are expected not only to support professional development but also to improve organizational performance (Hattie, 2008). Thus, if street-level bureaucrats use performance data with an emphasis on solving problems, we expect the following:

H3: Street-level bureaucrats are most likely to collaborate when their client has the most substantial problem (i.e., negative performance results and a disadvantaged social status).

H4: Street-level bureaucrats are least likely to collaborate when their client has the least substantial problem (i.e., positive performance results and an advantageous social status).

## Methods

### *Experimental Design*

We test our hypotheses with a survey experiment among a sample of Danish schoolteachers which was pre-registered at the Open Science Framework.[2] In line with other studies on the use of performance data among politicians (Nielsen & Bækgaard, 2015), public managers (Holm, 2018; Mikkelsen et al., 2022), and street-level bureaucrats (Mikkelsen et al., 2022), we employ an experimental design to address the challenges of endogeneity. In our case, the main hurdle is that client characteristics and performance are correlated.

We used a factorial 2×2 between-subjects design and showed participating teachers a vignette describing a student's academic performance and social status and behavior indicators (family background and social behavior). The design randomly varies performance level and social status and behavior on the dimensions: decline/improvement and disadvantageous/advantageous. To make the vignettes as realistic as possible, their wording was discussed with five teachers (outside the study sample) and the entire survey was pilot tested at a randomly selected school. Figure 1 below illustrates one example of the treatment conditions with a client who has declining academic performance and a disadvantaged social status:

**Figure 1: Example of a Treatment Condition**

*"Imagine that the students in your class have been tested in three assignments during the past year. Below, the results for one of the students, Peter, are shown. The test scores for the current year are based on comparison with the other students in the class. In addition, Peter's test score from the previous test is shown.*

| | Assignment 1 | Assignment 2 | Assignment 3 |
|---|---|---|---|
| Peter's result in 2020 | *Average* | *Average* | *Average* |
| Peter's result in 2021 | ***Below average*** | ***Substantially below average*** | ***Below average*** |

*Peter's mother is an* ***early retirement pensioner,*** *and his father drives a* ***taxi****. He has an older sister who is* ***preparing for technical college****. Peter often* ***mocks the other children*** *in class, and he has* ***severe concentration problems****."*

The bold text varied in the different conditions. In the Performance progression condition, the student's result in 2021 was "Above average", "Substantially above average", and "Above average". In the condition where the student had an advantageous social status, the text was: "Peter's mother is a doctor, and his father is director in a medium-sized company. He has an older sister who is attending high school. Peter is well liked among the other kids, and he participates in class." In line with former research showing that teachers define students at risk referring to both weak parental background and inappropriate social behavior (Møller & Harrits, 2013), the text includes information about Peter's classroom behavior as well as cues about his socioeconomic family background to mirror stereotypes often associated with social status. After presenting the teachers with the case, we asked for their opinion on several outcomes (operationalized in a section below).

### *Sample and Balance*

Our sample consists of 794 teachers from Danish elementary schools. The sample was randomly drawn, but as the municipalities and schools were asked to volunteer to participate in the survey, the sample might deviate from the Danish population of teachers.

Danish schools constitute a useful case for testing our hypotheses for three reasons. First, Danish public schools have considerable experience with performance data (Bjørnholt et al., 2022; Andersen & Dahler-Larsen, 2017). Second, performance data is often used to inform collaboration in professional learning communities in Danish schools (Qvortrup, 2016). Third, Danish teachers enjoy considerable discretion in using performance data and interpreting which students to help. Thus, there is both external pressure on Danish schools to use performance data and freedom for individual variation. However, no individual sanctions nor incentives or bonuses is tied to student performance and the performance system reflect "soft" control (Bjørnholt and Salomonsen, 2015).

We invited 34 randomly selected municipalities (of 98 municipalities in Denmark), of which seven allowed schools participate in the survey. The response rate of the study was approx. 20%. Table 2 shows that the four experimental groups are balanced on central characteristics of the teachers and their classes.

**Table 2: Balance Between the Experimental Groups**

| | Cond. A | Cond. B | Cond. C | Cond. D |
|---|---|---|---|---|
| Experience (in years) | 9.90 | 9.68 | 10.70 | 9.94 |
| Share of male teachers | 27.83% | 26.11% | 25.70% | 27.44% |
| Age (in years) | 46.48 | 45.32 | 47.46 | 45.51 |
| Number of classes pr. week | 23.18 | 22.47 | 22.17 | 22.43 |
| Share of teachers who act as a supervisor | 48.13% | 52.42% | 50.26% | 46.56% |
| Share of teachers who invested in continued education" | 41.62% | 38.10% | 34.76% | 31.00% |

Note: Cond. A = Performance decline/Disadvantaged SAS; Cond. B = Performance decline/Advantageous SAS, Cond. C = Performance progression/Disadvantaged SAS; Cond. D = Performance progression/Advantageous SAS.

***Outcomes***

After showing the teachers a vignette, we asked them about the client and their willingness to engage in collaboration with colleagues.

*Client evaluation*: We asked teachers about their client evaluation with the following item: "To what extent do you believe that Peter has academic challenges?" Responses on a scale from 0 ("No challenges") to 10 ("Significant challenges").

*Willingness to collaborate*: We distinguish between three steps in the collaborative process between teachers reflecting Professional Learning Communities (PLC) that is one the most widespread forms of collaboration schools (Vangrieken, et al., 2015) reflecting elements like data-informed collaborative dialogues and reflective practice, and ongoing development of professional competencies (DuFour and DuFour 2013). A first step is whether teachers are willing to bring up test results in order to collaboratively identify possible solutions (Gannon-Slater et al., 2017) reflecting a "collective responsibility for the learning". A second step is whether teachers activate fellow colleagues to observe their interaction with students in the classroom in order to provide feedback and identify professional solutions and reaction on e.g. poor student performance (Robinson et al 2008). Observation has proven effective in improving professional development and practice and is an important element of collaboration among school teachers (Friend et al., 2010; Rivkin & Schiman, 2015). In a third step, teachers engage in data-informed collaboration with and feedback from colleagues and school management in order to solve classroom issues and improve service quality (e.g., DeMatthews, 2014; Moynihan et al., 2020; Spanneut, 2010).

We asked the participating teachers about their willingness to collaborate in three situations reflecting the three dimensions above. All outcomes were measured on a scale from 0 ("Not at all") to 10 ("To a very high extent").

- Situation 1: "The first is a situation where you have the possibility to collaborate with other teachers to improve Peter's academic achievement. To what extent would you be willing to participate in such collaboration?"
- Situation 2: "The second situation concerns the possibility of having a colleague observe your teaching in class to improve Peter's academic achievement. To what extent would you be willing to have a colleague observe your teaching?"

- Situation 3: "The third situation concerns a meeting about the academic development for the class in general with a subject supervisor, a representative from school management and you. To what extent would you bring up Peter's test-score at the meeting?"

The three elements of collaboration reflect core theoretical dimensions of de-privatized practice and reflective dialogue within the education literature (Stoll et al, 2006; Vescio et al, 2008), Moreover, they are very well recognized activities in the 'teacher tool-box' in a Danish school context, where many schools have worked extensively with improving their collaboration practices and almost all schools have a team structure around each class and cohort.

### *Estimation Strategy*

We estimated treatment effects in an OLS regression. All outcomes have been standardized with a mean of 0 and standard deviation of 1 so estimates can be generalized. Estimates in the presented analyses are from models without covariates, but including covariates in the models yields substantively similar results (the online appendix: AP1 and AP3). Since the data has a multilevel structure with teachers embedded in schools, the models presented are linear multilevel models that account for the grouping of observations by allowing random intercepts for each school clustering the standard errors at the school-level. Pairwise comparisons between all treatment group means are outlined in Appendix table AP4.

## Results

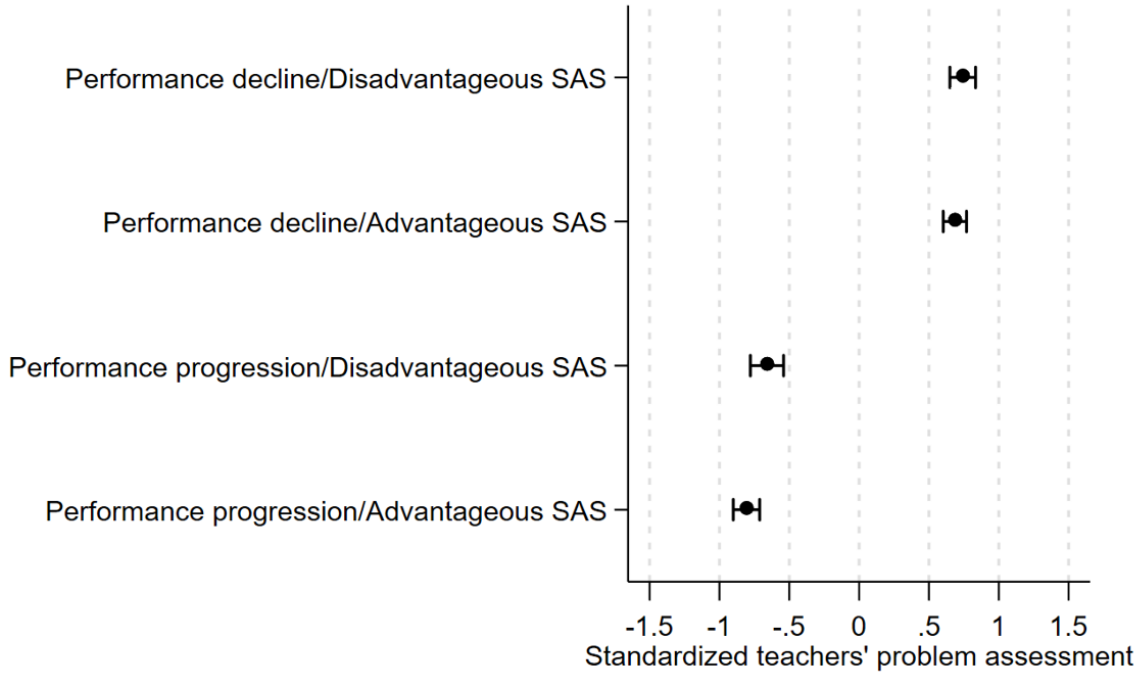
This section presents the results of the experiment. First, we examine how the interplay between performance data and client characteristics influences street-level bureaucrats' client evaluation and then turn to the willingness to engage in collaboration.

### *1st Analysis: Problem Asessment*

Testing hypotheses H1 and H2 regarding the teachers' problem assessment based on students' performance data and social status, Figure 2 shows teachers' problem assessments by the four treatment groups. For the group of teachers who were informed that the student has negative results, there is no significant difference in client evaluation between the groups who were told that the client in addition to declining performance has a disadvantageous, as opposed to an advantageous, family background and classroom behavior. The estimated difference of around -0.056 standard deviations is in the expected direction, however.

For teachers who were informed that the student has positive performance results, there is a significant 0.147difference in problem assessment between the client with an advantageous social status and behavior and the client with a disadvantageous status and behavior ($p = 0.053$). This is in line with the expectation in H2 and suggests that client characteristics can play a role in the interpretation of performance information. However, even though the results support H2, perhaps the most evident result from Figure 2 is that teachers to a large degree base their problem assessment on performance information. The effect of students' results is much larger than their social status.

**Figure 2: The Interplay Between Performance Data and Client SAS in Shaping Teacher's Problem Assessment**

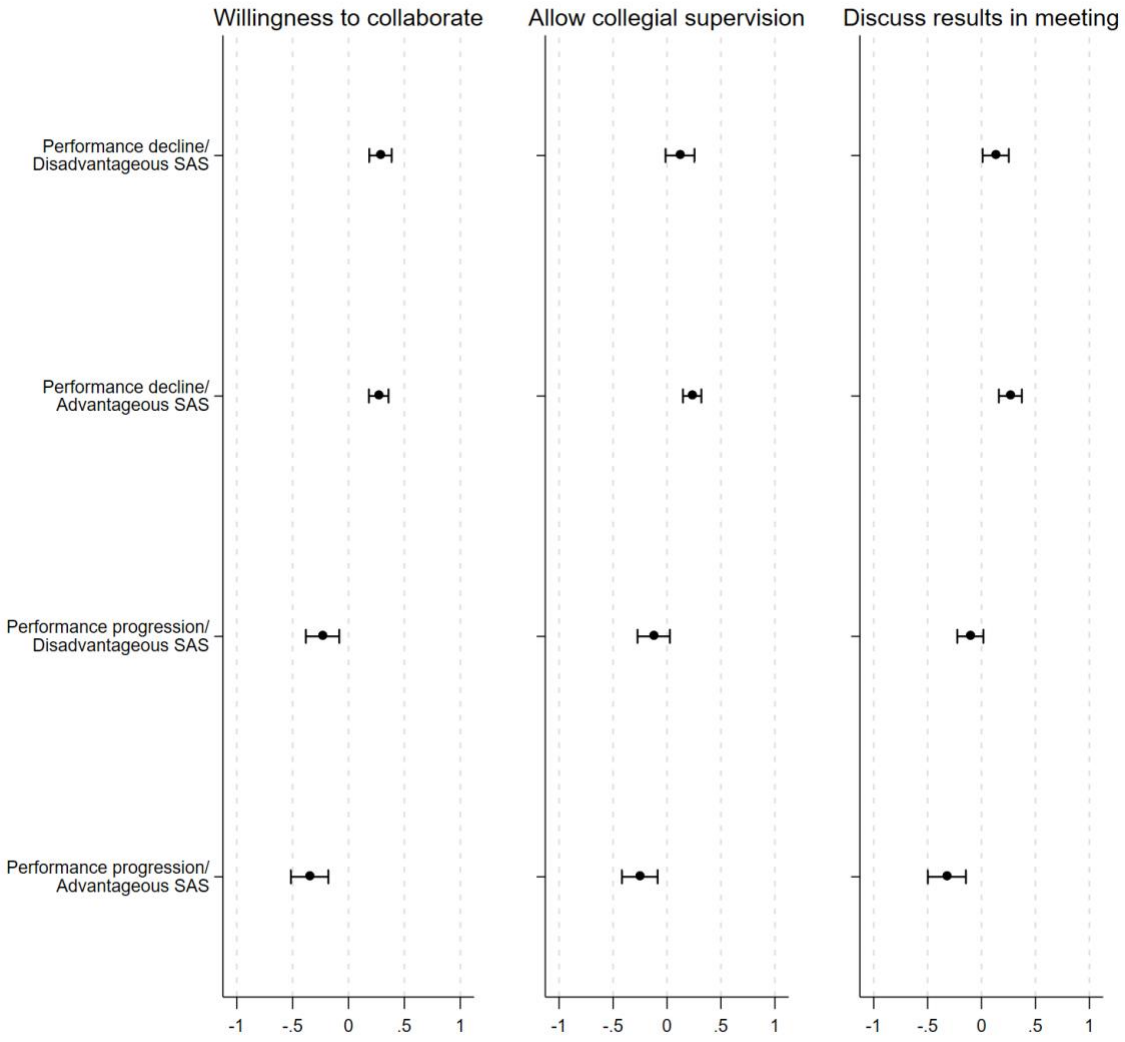



Note: Multilevel Linear Model with clustered standard errors at the school-level. Higher positive values indicate an increasing problem assessment.

***2nd Analysis: Willingness to Collaborate***

Examining hypotheses H3 and H4 regarding teachers' willingness to collaborate with colleagues based on the severity of their problem assessment, Figure 3 shows the teachers' willingness to engage in three forms of collaboration. First, we see that teachers are less willing to engage in collaboration when their client has the least substantial problems (i.e., positive results and advantageous social status). Second, teachers show the most willingness to engage in collaboration and to bring up the results at a meeting when they are informed that the client has a performance decline. In this situation, the role of the client's social status and behavior plays a very limited role (as indicated by the small and inconsistent coefficients). Thus, the clearest result is that teachers in general are more willing to engage in collaboration when their client has declining performance. This finding is evident across all three outcomes (albeit not significantly for the outcome that measures teachers' willingness to allow collegial supervision). Table AP2 in the appendix shows the full models

**Figure 3: The Interplay Between Performance Results and Client SAS in Shaping Teacher's Willingness to Cooperate**




Note: Multilevel Linear Model with clustered standard errors at the school-level. Higher values indicate an increasing willingness.

## Discussion and Conclusion

This study has examined how performance data and client characteristics influence street-level bureaucrats' decision-making. We used a survey experiment involving around 800 schoolteachers and found that these street-level bureaucrats incorporate client characteristics when they process performance data and evaluate identical results differently depending on the clients' social status. For example, clients with an advantaged social status and behavior whose performance improves are perceived as having fewer academic challenges than clients with identical results, who have a disadvantaged social status and behavior. While client characteristics linked with social status and behavior exert some influence, our findings also demonstrate that data and results remain the primary driver of decision-making. Thus, our findings tend to countering the tendency of performance management studies to focus on biases in performance information use (Moynihan 2018). Rather, we find that data steer street-level bureaucrats' judgments suggesting a dedication to objective

evaluation and making data-driven decisions. Importantly, this finding serves as a counterbalance to concerns about discriminatory behavior and cream-skimming: Decisions are not always swayed by biases but can be anchored in objective assessments.

However, it is imperative to acknowledge the study's limitations. The experiment, while meticulously designed, remains rooted in a fictitious context, and translating the findings to real-world situations introduces a level of uncertainty. Consequently, the study's insights offer valuable groundwork for further research that extends the analyses to authentic scenarios, for example through field study observations, for a more comprehensive understanding. This could include an evaluation of the extent to which and when teachers are inclined to take individual action rather than seeking collaboration. Furthermore, this study's vignettes include information on both the students' socioeconomic background and associated social behavior. Future studies are encouraged to disentangle street-level bureaucrats' decision-making reactions based on objective client information and client behavior and the extent to which their effects may offset each other. Moreover, we urge future research to replicate the findings using a conjoint design to allow for disentangling the effects of different social context factors. Additionally, future studies could benefit from more targeted priming—for example, isolating the effects of disabilities, which may increase perceptions of deservingness, from negative social behaviors, which may reduce them

**Acknowledgement**

This paper was presented at *the 2022 EGPA Conference, September 7-10 in Lisbon, Portugal SG II: Performance in the Public Sector. The authors would like to thank the study group participants and the anonymous reviewers at JBPA for constructive comments and feedback.*

**Notes**

1. Other factors that we do not consider in this article include ethnic origin and religious background.
2. https://osf.io/dfmb7/?view_only=ba530a45e5814eacadbfb46db2901705

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## Appendix

**Table AP1: The Interplay Between Performance Data and Student Social Status and Behavior (SAS) in Shaping Teacher's Problem Assessment**

| | | |
|---|---|---|
| Performance decline/Disadvantaged SAS | Ref. | Ref. |
| Performance decline/Advantageous SAS | -0.056 (0.063) | -0.055 (0.064) |
| Performance progression/Disadvantaged SAS | -1.420 (0.082) *** | -1.433 (0.083) *** |
| Performance progression/Advantageous SAS | -1.577 (0.077) *** | -1.587 (0.075) *** |
| Constant | 0.745 (0.047) *** | 0.835 (0.227) *** |
| Observations | 753 | 753 |
| Covariates | | X |

Note: Multilevel Linear Model with Clustered Standard Errors. Higher values indicate an increasing problem assessment. *** $p < 0.001$.

**Table AP2: The Interplay Between Performance Results and Student Social Status and Behavior (SAS) in Shaping Teacher's Willingness to Collaborate**

| Dependent variable | Willingness to collaborate | Allow collegial supervision | Discuss results in meeting |
|---|---|---|---|
| Performance decline/ Disadvantaged SAS | Ref. | Ref. | Ref. |
| Performance decline/ Advantageous SAS | -0.016 (0.067) | 0.113 (0.081) | 0.136 (0.086) |
| Performance progression/ Disadv. SAS | -0.518 (0.091) *** | -0.244 (0.098) * | -0.235 (0.093) * |
| Performance progression/ Adv. SAS | -0.634 (0.102) *** | -0.373 (0.109) *** | -0.453 (0.118) *** |
| Constant | 0.286 (0.051) *** | 0.121 (0.069) | 0.132 (0.062) * |
| Observations | 775 | 775 | 775 |

Note: Multilevel Linear Model with Clustered Standard Errors. * $p < 0.05$, *** $p < 0.001$.

**Table AP3: The Interplay Between Performance Results and Student Social Status and Behavior (SAS) in Shaping Teacher's Willingness to Collaborate**

| Dependent variable | Willingness to collaborate | Allow collegial supervision | Discuss results in meeting |
|---|---|---|---|
| Performance decline/ Disadvantaged SAS | Ref. | Ref. | Ref. |
| Performance decline/ Advantageous SAS | -0.015 (0.068) | 0.150 (0.078) | 0.115 (0.088) |
| Performance progression/ Disadv. SAS | -0.510 (0.093) *** | -0.191 (0.103) | -0.246 (0.094) ** |
| Performance progression/ Adv. SAS | -0.604 (0.100) *** | -0.311 (0.107) ** | -0.463 (0.112) *** |
| Constant | 0.184 (0.277) | -0.104 (0.270) | 0.134 (0.254) |
| Observations | 747 | 747 | 747 |
| Covariates | X | X | X |

Note: Multilevel Linear Model with Clustered Standard Errors. * $p < 0.05$, *** $p < 0.001$

**Table AP4: Pairwise Comparisons Between All Treatment Group Means**

| Dependent variables | Problem assessment | Willingness to collaborate | Allow collegial supervision | Discuss results in meeting |
|---|---|---|---|---|
| Performance decline/ Adv. SAS vs. Performance decline/Disadv. SAS | -0.056 | -0.015 | 0.113 | 0.136 |
| | (0.070) | (0.097) | (0.099) | (0.098) |
| Performance prog. / Disadv. SAS vs. | -1.391 | -0.515 | -0.242 | -0.231 |
| Performance decline/Disadv. SAS | (0.708) *** | (0.098) *** | (0.101) | (0.100) |
| Performance prog. / Adv. SAS vs. | -1.549 | -0.632 | -0.373 | -0.453 |
| Performance decline/Disadv. SAS | (0.071) *** | (0.099) *** | (0.101) * | (0.100) *** |
| Performance prog. / Disadv. SAS vs. | -1.335 | -0.500 | -0.355 | -0.367 |
| Performance decline/ Adv. SAS | (0.069) *** | (0.096) *** | (0.097) * | (0.098) * |
| Performance prog. / Adv. SAS vs. | -1.493 | -0.617 | -0.486 | -0.589 |
| Performance decline/ Adv. SAS | (0.069) *** | (0.097) *** | (0.099) *** | (0.098) *** |
| Performance prog. /Adv. SAS vs. | -0.158 | 0.118 | -0.131 | -0.222 |
| Performance prog. / Disadv. SAS | (0.070) | (0.098) | (0.101) | (0.100) |

Note: * $p < 0.05$, *** $p < 0.001$