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**WHO CREAMS? EXPLAINING THE CLASSROOM CREAM-SKIMMING  
BEHAVIOR OF SCHOOL TEACHERS FROM A STREET-LEVEL  
BUREAUCRACY PERSPECTIVE**

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***ABSTRACT:** Ideas as to how and why individuals resort to creaming are generated primarily by a few qualitative studies and have to our knowledge so far not been tested quantitatively. This paper aims to fill this gap and explains the classroom cream-skimming behavior of school teachers in Denmark, defined as prioritizing the teaching of academically promising students. Drawing on the street-level bureaucracy literature, it tests the following propositions: 1) creaming is directly related to an inadequacy of resources and this relationship is moderated by the breadth of parental involvement in their children's education, 2) creaming is weakly related to the presence of bureaucratic success criteria and 3) creaming is directly related to the level of parental involvement in and satisfaction with their children's education. These are tested using data from a 2011 survey of Danish and Mathematics teachers in public and private schools across Denmark, and a class-fixed-effects design. Overall, the findings provide varying support for these propositions.*

## INTRODUCTION

Why do school teachers resort to cream-skimming among their students?

Cream-skimming, or simply “creaming,” can be defined simply as “selection of those clients who seem most likely to succeed in terms of bureaucratic success criteria” and is thus a behavior that differentiates among the recipients of services on the basis of expected outcomes. The phenomenon is important both from a normative perspective (are resources being allocated equitably?) and from the perspective of economic efficiency (are resources being allocated efficiently?). Research on creaming so far has primarily been from these perspectives and focused almost exclusively on the *effects* of creaming, primarily by organizations, or on whether creaming behavior follows as predicted by the existence of external incentives to do so. Research on creaming in the field of education is no exception, with a number of studies, for example, on the effects of different forms of school choice on creaming among schools (e.g., Altonji et al. 2010; Rouse and Barrow 2008). In contrast, little research has been conducted on *why* creaming occurs, especially in a classroom setting. Anecdotal accounts suggest that teachers giving preferential treatment to some students in class is a commonplace phenomenon, and research on the subject, wholly qualitative, supports this view (Hughes, Gleason and Zhang 2005; Lipsky 1980; Rist 1973). The research question thus becomes, if the existence of creaming by teachers in the classroom can be documented, what factors can explain this phenomenon?

There is a rich vein of quantitative research on creaming that analyzes the effect of external (i.e. exogenously determined) incentives on creaming behavior of organizations across a wide range of fields (e.g., in the health care sector: Berta et al. 2009; Mukamel et al. 2009; in social welfare services: Heckman et al. 1997, 2002;

Heinrich 1999; Koning and Heinrich 2010; Skedinger and Widerstedt 2007 and in education: Andersen and Serritzlew 2008; Altonji et al. 2010; Rouse and Barrow 2008). In contrast, creaming by individuals has been studied only by a few, but richly detailed, qualitative studies crystallized around the concept of street-level bureaucracy (SLB; see Anagnostopoulos 2003; Goldstein 2008; Lipsky 1980; Rist 1973; Weatherley and Lipsky 1977; Weatherley 1979), which have generated additional ideas about why these officials resort to creaming and “coping”. Some of these propositions are particularly useful for explaining creaming behavior in contexts such as the Danish school system (described further below in the section on Context) in which the link between performance standards and related incentives, on one hand, and creaming behavior at the individual level, on the other, are hard to pinpoint. This study is to our knowledge the first to test some of these propositions quantitatively. Public administration literature has traditionally been dominated by qualitative methods (Groeneveld et al. 2015), and though use of quantitative methods is on the rise, their use in studies on coping, and especially creaming, at the individual level is still uncommon.

This study of teachers as “street-level bureaucrats“ (SLBs) extends research on SLBs and human service organizations more generally because there are some aspects of street-level bureaucracy in the context of education that distinguish it from SLB in other human services contexts, such as those in which child protection workers, caseworkers at job centers, nurses, policemen and environmental inspectors operate. These distinguishing characteristics have implications for the study of creaming in classrooms. Students are similar to some other types of clients of human services agencies in that they are a universally “captive” or non-voluntary clientele in the

sense that education is compulsory for all children and that the vast majority of parents send their children to school rather than home-school. Second, students are different from many other types of clients because they are typically grouped together in classes and receive teaching services collectively instead of individually, and over a relatively long period of time. This collective setting, which fosters interaction between clients (the consequences of which are examined in the literature on class peer effects, e.g., Sacerdote 2011), is a necessary precondition for creaming by school teachers. Finally, teachers as service providers have far more frequent and regular contact with their clients than do most other types of SLBs. Creaming in the classroom in such a context tends to take a form that is more continuous than discrete (as for example, in the case of selection of a client to a specific program or intervention), does not leave a paper trail and is therefore harder to document. It is manifested, for example, as less attention paid to weaker students rather than complete exclusion of students from selected activities. Therefore, creaming from teachers' perspective presents some significant barriers to quantitative study.<sup>1</sup> The same however does not apply to students' perspectives on teachers' differential behavior, which are well documented by studies in the psychology of education. These studies have found, for example, that in comparison to "low achievers", students felt that teachers interacted more positively with high achieving students, that they had higher expectations of them, and that they offered them more leadership opportunities and more choice in their learning experiences. Further, teachers' relationship to their students are influenced by teachers' relationship to the students' parents. More generally, research shows that teachers' expectations of students are influenced not only by students' actual ability but also by a range of other factors (see

e.g., Hughes and Kwok 2007; Hughes, Gleason and Zhang 2005; Rosenthal 1991; Rosenthal and Jacobsen 1968; Rubie-Davies 2006, 2010).

School students are, similar to other minor-age clients, different from adult clients because their parents are also clients that can and do influence service providers (teachers and principals) on behalf of their offspring. At the same time, parents are subject to increasing demands on the school front through the spread of initiatives such as the “school-home partnership” (Knudsen 2010; Knudsen and Andersen 2013 for a good description of this development in Denmark). As in other service provider settings, inequities in service provision in a classroom context can also be explained by differences in client (here, parental and student) engagement and influence (Blase 1987, 1988; Hughes and Kwok 2007; Hughes, Gleason and Zhang 2005). These differences have, in turn, been linked to differences in social class, ethnicity and teachers’ perceptions of parents (e.g., Knudsen 2010; Lasky 2000; Vincent 1996).

In the next section, we discuss how the findings in the literature on street-level bureaucracy can be used to provide insight into creaming in classrooms. Then we describe the context in which creaming is studied, the Danish school system. This is followed by a description of the data and the statistical method, linear regression with class level fixed effects. Following this, we present the findings of the quantitative analysis. We end with a discussion of broader implications of the findings for street-level bureaucracy and future research.

## **THEORETICAL DISCUSSION: CREAMING FROM A STREET-LEVEL BUREAURACY PERSPECTIVE**

Lipsky's perspective on "street-level" bureaucracy focuses on those public officials who interact directly with citizens in implementing public policies and exercise discretion in doing so. These frontline workers are confronted by highly complex and technically uncertain tasks for which they are trained to varying degrees. The uncertain nature of these tasks, that is, the unclear relationship between means and ends, both entails and requires that these workers employ high degrees of discretion in their work (Lipsky 1980; Hupe, Hill, and Buffat 2015; Handler and Hollingsworth 1971). Lipsky referred to these frontline workers as SLBs and argued that they determine organizational policy and, more broadly, governmental policy, through the routines and categories they develop to reduce the endemic uncertainties of their tasks.<sup>2</sup>

The work of Lipsky and of the scholars he cites in his arguments is not the only description of frontline workers. For example, more recently Maynard-Moody and Musheno (2000, 2003, 2012) contrast what they term the established "state agent (S-A) narrative," exemplified in their view by Lipsky's work among others, to the "citizen-agent (C-A) narrative" and highlight a number of differences between the two. While the S-A narrative focuses on SLBs as policy makers and how faithfully they implement rules and regulations, the C-A narrative focuses on how frontline workers act in response to individuals and circumstances. Most relevant to our study is the distinction they draw between the two concepts with regard to *why* frontline workers act in response to individual clients and circumstances. In the S-A narrative, SLBs use their perceptions of client characteristics and circumstances primarily in

order to ration services, which is a way of coping with the chronic shortage of resources they face (Lipsky 2010, 107-111). In contrast, in the C-A narrative, frontline workers act not out of self-interest with a view to easing their work burden but selflessly. They will often make their work harder, more unpleasant, dangerous and less officially successful in order to respond to the needs of individuals. Thus, while workers in both narratives act on their assessments of clients' personal situation and moral character, in the S-A narrative, their motives are selfish – a desire to manage workload – while in the C-A narrative, they are selfless.

As mentioned above, although street-level bureaucrats aim to fulfill organizational goals and address the needs of all their clients, chronic resource inadequacies, ambiguous goals, and non-voluntary clients compound the difficulties of their work. The two most important manifestations of resource inadequacies, according to Lipsky, are a high worker-to-client ratio and lack of time. This means, for example, that SLBs such as teachers are faced with overcrowded classrooms with few supplies and therefore cannot give their students the optimal amount of personal attention, using valuable teaching time for maintaining order in class (Lipsky 1980, 27-30). These working conditions are compounded by intra-class diversity in terms of student ability and social background.

SLBs employ a number of strategies to deal or cope with the workload and resulting pressure caused in part by these resource shortages, and the concept of “coping” has been defined and measured in many different ways (Tummers, Bekkers, Vink and Musheno 2015). Tummers et al. (2015) adapt Folkmans and Lazarus' (1980 cited in Loyens 2015) definition to the context of public service delivery, and define coping as “behavioral efforts frontline workers employ when interacting with clients,



in order to master, tolerate, or reduce external and internal demands and conflicts they face on an everyday basis” (Tummers et al. 2015, 1100).

Lipsky identified various coping strategies used by SLBs. One is to reclassify clients and ration scarce resources. One way of rationing is to show preference to those clients considered “deserving” and away from those clients considered “undeserving” (Lipsky 1980; see also Hasenfeld 2010a; Maynard Moody and Musheno 2010; Meyers and Nielsen 2012; Prottas 1979).

Another example – the subject of this study --is “creaming” or “cream-skimming,” a concept implying that “street-level bureaucrats often choose (or skim off the top) those clients who seem most likely to succeed in terms of bureaucratic success criteria” despite formal requirements to provide clients with equal chances for service (Lipsky 1980, 107).<sup>3</sup>

We draw the following proposition from the above discussion.

H1: *Creaming is directly related to a shortage of personal and organizational resources* (Lipsky 1980). In other words, the greater the shortage of such resources, the greater the creaming. Inadequacy of resources can be measured in a number of ways. The measure of chronic resource inadequacy most relevant to creaming in the classroom is in terms of time devoted to the teacher’s core activity: teaching. Given fixed teaching goals indicated by the education ministry, the lower the proportion of class time a teacher can devote to teaching (for example, because of problems with audiovisual equipment or with class management) the greater the burden on the teacher and the greater the creaming she would resort to. Other personal resources include factors such as training and education, specialization and experience.

Organizational resources in a school can be for example the physical infrastructure such as classrooms, audio-visual aids, and specialized teaching consultants, as well as arrangements that make teaching and learning more effective (e.g., the use of different types of cooperative platforms among teachers).

Lipsky argues that creaming occurs because of the perverse incentives agencies give to their employees. Success with clients is rewarded, but no rewards are given for risks taken. For example, in a school context this means that because teachers are not evaluated by the rate of progress their students made compared to a predicted rate (i.e., a focus on outcomes instead of on impact or value-added), students showing a potential for high achievement, however determined, are likely to be the most valued (Lipsky 1980, 107-108). More generally, Lipsky argues that “since not all potential clients can be served, the reward structure of the agency is adopted as its implicit agenda in the absence of powerful incentives to the contrary. If all clients are equally worthy but all cannot be served, increasing the rate of personal or agency success becomes primary” (Lipsky 1980, 107). Thus, creaming, similar to other coping behaviors, is also partly a response to a resource shortage whereby not all clients can be served and resources are rationed on the basis of students’ potential for success (Lipsky 1980, 110-111).

Quantitative studies of creaming, which draw on economic theory, also define creaming in terms of a focus on outcomes over impact in response to performance incentives (Heckman et al. 2002; Heinrich 1999).<sup>4</sup> But, in contrast to the SLB perspective, which conceptualizes creaming primarily as a response to a sustained resource inadequacy, these studies typically focus on the exogenous factors influencing such behavior, such as visible external incentives linked to institutional

performance standards (see, e.g., Anderson et al. 1993; Heckman et al. 2002).

However, creaming takes place even in the absence of such incentives, as described below, and it is especially in such conditions that Lipsky's theorizing makes an important contribution to explaining why creaming occurs.

In addition, SLBs may not resort to creaming even in the presence of such incentives. Motivated by a strong desire to aid the least well-off, they may enforce the principle of equality of treatment or even select those least likely to succeed on pre-specified performance outcomes (e.g., Heckman et al. 1996; Lipsky 1980; Maynard-Moody and Musheno 2003). In other words, SLBs' preferences may be dominated more by internal motivations, captured by such constructs as public service motivation (described variously in terms such as civic duty and compassion, (e.g., Perry and Wise 1990, Perry 1996) or going beyond self-interest (Vandenabeele 2007)), altruism (e.g., Rainey and Steinbauer 1999), described also in terms of self-sacrifice (e.g., Perry and Wise 1990, Perry 1996), and prosocial motivation (Grant 2008) than by external motivations, e.g., the desire for greater enrichment. As Perry, Hondeghem and Wise (2010) note, the common core of these internal motivation constructs is a selfless desire to help others. Teachers motivated by such considerations may not respond to the external incentives linked to performance standards.

The foregoing discussion points to a number of factors that could explain why creaming in the classroom varies across school teachers: a shortage of resources, bureaucratic success criteria combined with external incentives to creaming, and professional norms and moral values (compassion and a commitment to public service) that counter the motivation to discriminate among clients. As we document

below, however, there is widespread resort to classroom creaming by Danish school teachers even though the external incentives to cream are at best unclear.

### **CONTEXT: SCHOOLING IN DENMARK**

The main characteristics of the Danish school system suggest first that, though schools have, to a varying degree, reasons to compete, the link between inter-school competition and creaming in the classroom is elusive. Second, Danish school teachers' own perceptions suggest that their working conditions are characterized by basic resource inadequacies broadly defined, which should motivate creaming. These include resources such as extra teachers in the classroom and training in methods such as differentiated teaching to address the needs of a heterogeneous student group. Third, there are increasing demands from the school system for parents' involvement in their children's schooling through initiatives such as the "school-home partnership". Teachers and parents, in particular those from weaker socio-economic backgrounds, are ill-equipped to respond to these demands (Knudsen 2010; Richter 2008). These conditions provide motivation for giving preferential treatment to some types of students. Fourth, owing to greater self-selection by parents and students into private schools, such schools are overall characterized by a more homogeneous clientele, e.g., in terms of socio-economic background or a common reason for selecting a school such as academic profile (sports, humanities), and educational philosophy.

Schooling is compulsory in Denmark for everyone between the ages of 6-7 and 16, and is both publicly and privately provided (Danish Ministry of Education

2012). It consists of one year of pre-school class, nine years of primary and lower secondary education, which ends in ninth grade with a school-leaving examination, and an optional one-year 10th grade. There were 510 private schools, and approximately 1,600 public schools in 2011; about 14% of all children at basic school level (including the voluntary preschool class and 10th grade) attend private schools, while almost all the rest attend public schools (Danish Ministry of Education 2012; Organization for Economic Cooperation and Development [OECD] 2004). Danish schools are relatively small, with a maximum of 1,000 students. In 2002, the average public school had 343 students, and the average private school had 173 (Ministry of Education 2003). Students in a class typically stay together from preschool and at least through the first seven grades. The same teachers usually follow the class from the first grade. The student turnover rate is low, with only 16% of students leaving for another school from the pre-school year through the ninth grade (Andersen and Serritzlew 2007).

There are different types of private schools, which, in contrast to public schools, are self-governing nonprofit organizations and are more exposed to competition than public schools. They are typically distinguished on the basis of their profile. Their main source of funding is a state subsidy, which makes up 80% of their total income<sup>5</sup> and is about 72% of the average subsidy per student for public schools. Private funding, primarily student fees, makes up the remainder. Even though the private schools cannot generate profit, they are inherently governed by market competition and reliance on student enrollment, and they risk closing if they cannot attract enough students (Andersen and Serritzlew 2007; Hvidman and Andersen 2013). Further, although parents can apply for enrollment in a public school from a

school district other than the one their child was assigned to or in a public school outside their local school district, acceptance is conditional on approval from both the school and the municipality. This also means that public schools' scope for creaming at the entry level is limited to the admission seekers from outside the school district. Thus, while both types of schools have an incentive to maximize student intake subject to structural constraints (including regulations regarding class size), the need to attract students is greater among private schools since a larger part of their funding comes from student fees and because they are less assured of a supply of students in the form of those assigned to the school from the local school district.

Whether students do indeed seek admission to a particular school depends largely on their parents' choice, which in turn depends on a range of factors, including the school's profile and values, the socio-economic composition of its student body and the school's performance (Andersen 2008). Client selection of service providers has been facilitated, first, by the introduction in 2005 of the right to free school choice (subject to capacity), which a number of parents have exercised (Rambøll Management 2007, 2011) and, second, by the public dissemination of school results in the 9<sup>th</sup> grade school-leaving examination, begun several years ago. The class student composition in private schools is thus likely to be more homogeneous than that in public schools (e.g., with respect to student motivation or socio-economic background) if students and parents select to a greater extent into private schools for those reasons, as some studies suggest.

A review of the U.S. literature (Andersen 2008) suggests that the student clientele of private schools differs significantly from that of public schools in terms of race and SES, and offers varying evidence that private schools cream more. Private

schools are free to select students from among applicants, and have considerable leeway when it comes to approaches to learning and curricula. They are authorized and receive government funding regardless of the ideological, religious, political or ethnic motivations behind their establishment, so barriers to entry are relatively low in the private school market (Christensen 1998, 183–8; for further background information on the Danish school system, see OECD 2004). (Andersen 2008).

In sum, this suggests that, seen from the supply side, Danish schools as service providers, particularly private schools, have the ability and incentive to cream to the extent that they can attract more and potentially better students. Such creaming is supported from the demand side by parents' ability to undertake systematic comparisons of schools' performance and choose among them.

However, though both public and private schools can cream and have an incentive to do so to the extent that creaming reinforces the school's competitiveness, it is difficult to identify an observable link between an individual teacher's contribution to her school's overall academic result -- one of the bases of school competitiveness -- and her classroom cream-skimming behavior. This is because while creaming by definition involves favoring groups of students, schools can be compared not on the basis of the performance of individual students but only on their overall performance. There are, for example, no public cross-school rankings of the performance of individual students by subject. The above discussion leads to the following proposition, which we will test:

*H2. Creaming is weakly related to the expectations regarding academic performance (the bureaucratic success criterion) emphasized by school management and the direction of the relationship is unclear.* For the reasons discussed previously,

even though school management may expect teachers to raise academic standards, the link between such expectations and creaming in the class is unclear and weak. This is because performance can be assessed collectively for the school as a whole, while creaming is individual. In addition, the incentives to achieve such performance standards also tend to be unclear.

Further, under such conditions, a goal of raising overall school academic competitiveness can be a motor for creaming at the class level only if such creaming helps to improve school performance. This, in turn, is possible only if it leads to an improvement in performance among those students being creamed that exceeds in magnitude any deterioration in performance among those not being creamed. This is an assumption teachers may consciously or unconsciously act on, especially if it is facilitated by parents' differential engagement in and influence on the teacher's behavior.<sup>6</sup> It is typically parents from more advantaged backgrounds who are more actively involved in school activities; it is also such parents that are the most demanding clients on behalf of their children, and it is likely the opinions of such parents regarding the school and its reputation that teachers use as reference point or bench mark. Thus, on one hand, we expect teachers to be encouraged to be as inclusive in their teaching with a view to improving their class', and thereby their school's overall results. On the other hand, such inclusiveness would be undermined by parents' differential engagement in and influence on teaching, which would generate an incentive to cream.<sup>7</sup>

An incentive to cream is reinforced by the interactive nature of the teaching process combined with varying ability and dispositions among the students to collaborate in it (see also Hazenfeld 2010). For example, studies have shown that



teachers' differential treatment of students can be a mechanism for transmitting their differential expectations of students and can have tangible effects on students' perceptions of their ability and on their performance (Rubie-Davies 2006). More than most other front-line occupations, teaching is perhaps more of a continuous and multi-lateral interactive process. Its success depends not only on the interaction among the students, both individually and in groups, and teacher but also among the students.

This interaction is not only unavoidable (and in some respects desirable) but also requires that students actively support and collaborate in the provision of teaching services not only to themselves but to others in the classroom. This implies that a greater focus on academic standards, and in particular such standards as a yardstick of competitiveness, will foster greater creaming given the socially biased nature of parent-teacher interaction and the related differential engagement by students in the learning process. Drawing on the above discussion, we propose testing the following propositions: H3a. *Creaming is directly related to teachers' perception of the extent of parental involvement in and satisfaction with teaching.* As noted in the description of the Danish school system and the increasing demands it places on parents, parental involvement and influence varies and is socially biased, and thereby provides fuel to the motor for creaming.

H3b. *The relationship between parental involvement and creaming is different for public and private schools.* Private (public) schools have a more homogeneous (heterogeneous) client group, and will be characterized by a negative (positive) relationship between parental involvement and creaming. This is because, as pointed out earlier, the scope for creaming hinges primarily on perceived differences among

clients with respect to ability. If all clients were the same, creaming would be impossible.

Incentives by school management, whether individual or collective, pecuniary (e.g., salary bonus) or non-pecuniary (e.g., in the form of praise, greater and more prestigious responsibilities) do not make the direction of the link between inter-school competition and classroom creaming clearer. Pecuniary individualized incentives among public school teachers in Denmark are virtually non-existent. The use of results-based pay supplements has been very limited, with the average result-based bonus for public school teachers negligible in 2008 (Nielsen and Mikkelsen 2009: 15-18). Similar documentation for private schools is unavailable. However, regardless of the incentives, these would be used with a view to improving a class' *overall* performance, the link of which to creaming in class remains unclear, as discussed previously.

## **DATA AND MEASURES**

### **Data**

The data for this study come from a 2011 web-based survey of 9<sup>th</sup> grade Danish and Mathematics teachers in public and private schools across Denmark. Questions in the survey covered both teachers' perceptions of school management and their well-being at school, among other topics. A questionnaire was sent to 1,998 teachers, and 1,130 (57 %) responded. The data are representative of the population to an acceptable degree in spite of non-responses (Pedersen and Hvidman 2011). Listwise deletion of missing values on variables included in the regression analysis reduced the number of

observations to 839. An important characteristic of the data, which we exploit using class-fixed-effects estimation, is that they are nested: students and teachers are nested in classes, which in turn are nested in schools. The number of observations was further reduced by the constraints imposed by the class-fixed-effects strategy employed, which limited the sample to those classes with responses from two teachers (teaching Danish and Math, respectively). (The Method and Results section below provides a discussion of the class-fixed-effects method of estimation.) The multivariate analysis presented below is thus based on 160 classes, each with two teachers (one teaching Danish and other Math., giving a total of 320 teachers), spread across 149 schools. Of these classes, 128 classes are situated in public schools and 32 in private schools.<sup>8</sup>

### **Measures: Dependent Variable**

#### *Creaming Behavior*

Creaming behavior is measured by the following question: *To what extent do you agree or disagree with the following statements? I give greater priority to teaching students who have a good chance of doing well academically.* Response choices ranged from Strongly disagree (= 1) to Strongly agree (= 5). As one would expect, the variable is negatively correlated to the belief that adaptation of instruction to each student's needs and academic abilities promotes learning. In other words, teachers who give greater importance to teaching students they perceive as "high achievers" are less likely to adapt their teaching methods to meet the needs and requirements of all students – including those who are scholastically weaker and therefore require greater attention.

## Measures: Explanatory Variables

### *Teacher's Shortage of Resources*

*Shortage of time for teaching.* A shortage of teaching time is measured by the percentage of lesson time spent on keeping order in class or dealing with individual students' issues (A) relative to the percentage spent on actual teaching (B). Thus the measure is the ratio A/B. The higher the ratio, i.e., the greater A relative to B, the greater the teacher suffers from inadequacy of a crucial resource, time for teaching. There are two advantages of using such a measure: it captures the trade-off between teaching and other activities that interfere with that core activity and, at the same time, it takes into account the factors (e.g., problems with class discipline and a healthy class atmosphere that partly reflect the teacher's class management skills) that would be most conducive to creaming. The variable was standardized. The measure was derived from the following question: *What percentage of your lessons is spent on average on the following activities: 1. Administrative/practical tasks; 2. Maintaining order in class and dealing with individual students' well-being; 3. Actual teaching; 4. Other things.* The item has been used in earlier editions of the OECD's Teaching and Learning International Survey (TALIS), which indicates that teachers across different national contexts face the same problem of class management, but to varying degrees.

*A shortage of infrastructural and support resources.* This was measured by an index constructed by calculating the mean of responses to the following four items, which was then standardized: *To what extent do you feel that your ability to provide optimal teaching is hindered by the following circumstances?*<sup>9</sup>

1: *Too few opportunities for further training/courses*

2: *Too few or insufficient teaching materials (e.g., textbooks)*

3: *Too little or insufficient educational equipment (e.g., computers, audio-visual equipment.)*

4: *Poor condition of the school's facilities (e.g., classrooms, playgrounds)*

Responses choices ranged from Not at all (= 1) to To a very large extent (= 5).

*Bureaucratic success criteria.* Raising academic standards is measured with two items regarding teachers' perceptions of the goals school management would like them to achieve and constitute general guidelines for orienting their teaching in the classroom.

1. Respondents were presented with the following two statements, A and B:

A. *School management has no expectations about how the school's graduating students do in terms of grades compared to students from other schools.*

B. *School management expects that students graduating from the school get better grades than students from other schools.*

Responses ranged from Strongly agree with A (= 1) to Strongly agree with B (= 5).<sup>10</sup>

2. *School management has high expectations for the students' academic standards.*

Response choices ranged from Strongly disagree (= 1) to Strongly agree (= 5). Both variables focus on management's expectations regarding academic standards, as reflected in the performance of graduating students relative to other schools and in academic performance more generally and are as expected also highly correlated ( $r = .61$ ). Therefore they were combined to form a summative index of management's expectations regarding performance.

*Parent involvement in teaching.* This is measured by two variables to capture different aspects of teacher- parent interaction from the teacher's perspective. These are a) the percentage of parents in the class engaged in their children's schooling (standardized for easier interpretation in an interaction term), and b) the overall level of satisfaction among class parents; response categories ranged from Much below average (= 1) to Well above average (= 5).

### *Control Variables*

As mentioned below in the Methods and Results section, class and school characteristics are controlled for by design. In addition, we correct for the following observable differences between teachers.

*Public service motivation.* To control for a competing explanation, that creaming was inversely related to the degree of commitment to public service (Heckman et al. 1996), we constructed an index of eight items measuring public service motivation (PSM; e.g., Perry 1996; Perry, Hondgehem and Wise 2010; Perry and Wise 1990; Andersen et al. 2014). These items included statements such as *it is very important for me that public services are satisfactory; it is my duty as a citizen to do something that best serves society; consideration for the welfare of others is for me one of the most important values; I feel that I am contributing to society.*<sup>11</sup> The resulting index ranged from low PSM (= 1) to high PSM (= 5) after the coding was reversed.<sup>12</sup>

We also controlled for the following variables: teacher's gender, education and additional training, whether the teacher taught Danish or Math, whether teachers were employed full-time, degree of familiarity between teacher and students measured by

the number of years the teacher has taught the same group of students (over a number of classes). It is important to control for these variables because they can all affect a teacher's ability to use the given resources (time, infrastructure) more effectively. For example, a teacher specializing in the subject she teaches, or one with longer experience or greater familiarity with a specific group of students, is likely to be better at class management partly because of her better grasp of the theory and practice of teaching and of the students to be taught. Therefore, all else equal, such a teacher will cream less.

## **METHOD AND RESULTS**

### **Method**

As mentioned in the Data section, we used class fixed effects method to model creaming, exploiting the fact that there are two teachers for each class of students, whose subjects are Math and Danish, respectively. This is in essence a statistical comparison of the behavior of two teachers providing instruction in different subjects to the same class (group) of students. The advantage of this method is that it allows us to control for all of the *unobserved* factors that could be associated with our main explanatory variables and whose exclusion from the model would therefore result in biased estimates. The class fixed effects control for all of the unobserved individual and collective student characteristics (e.g., overall ability and motivation and socio-economic and ethnic composition of the student group) that are constant across teachers as well as the unobserved objective factors such as the physical infrastructure they have in common, the management of the school where they teach and the

competition from other schools to which the school is exposed. We cannot otherwise control for these factors because we lack measurements for them.

This method cannot control for unobserved teacher characteristics such as basic teaching ability, which includes class management skills, and underscores the fact that teachers evaluate their work environment differently. This is a problem if these characteristics are both correlated with the main explanatory variables and creaming. For example, a teacher poor in class room management may herself provoke a reaction from some students such that she is left with less time to teach and therefore focuses on the more positively engaged students. The single most common request for assistance from teachers is related to student behavior and classroom management (Rose and Gallup 2005). Classrooms with frequent disruptive behaviors have less academic engaged time, and the students in disruptive classrooms tend to have lower grades and do poorer on standardized tests (Shinn et al. 1987).

The indicator of resource shortage used here, shortage of teaching time, partly deals with this shortcoming because one of its components is the time spent on class discipline and student's personal issues, which is an indirect measure of class management skills. In addition, we include measures of teacher gender, education, experience and motivation and the subject taught to control for teaching ability. These are standard control variables in studies of effects of teacher characteristics (Andersen et al. 2014). This limits the omitted variable bias to any remaining unobserved teacher and student characteristics that are related to creaming and the explanatory variables of interest.



It should be noted that creaming is measured on a five-point Likert-type scale. The use of linear regression for an ordinal measured dependent variable, in particular one using fixed effects, requires less stringent assumptions regarding the data structure.<sup>13</sup> It is appropriate if one is interested in estimating average effects rather than out of sample predictions. In addition, it allows for much easier interpretation of interaction terms than an ordinal logit model with fixed effects.

Next we regressed the creaming variable on the explanatory variables described above. To account for the fact that there was more than one class in a number of schools in the sample, standard errors were estimated using the Stata robust cluster estimator (with school identifier as the cluster variable), which adjusts for both intra-cluster correlation and heteroskedasticity. The results for the three samples (all schools, private and public schools) are presented in table 1. For each sample, the first model includes only the main variables of interest: the two variables measuring a shortage of resources, management focus on academic standards and the two variables tapping teacher's interaction with class parents. The second model tests the robustness of the main explanatory variables to the inclusion of several controls for teacher characteristics. The third model includes the interaction term (Shortage of teaching time x Percentage of parents engaged in schooling) to test proposition 3b: the relationship between teacher's time shortage and creaming is moderated by the percentage of parents involved in class activities.<sup>14</sup> In this model, the constitutive elements of the interaction term cannot be interpreted as unconditional marginal effects (Brambor, Clark and Golder 2005). For estimates of the unconditional effects of these variables we have to look at the results of model 2.

## RESULTS

If one uses the responses “Agree” or “Strongly agree” to the question on creaming as indicators of creaming, then 30 percent of the teachers in the entire sample resort to creaming. This percentage is strikingly high given Danish social norms in favor of social equality and non-discrimination, teachers’ professional norms in particular favoring equality of treatment. Further, the summary statistics shown in Table A1 (appendix) indicate that the difference in means on the creaming variable between public and private schools is not significant.

Table A1 also shows that there is no statistically significant difference between public and private schools with respect to shortage of teaching time and management’s performance expectations. However, teachers in public schools suffer from a greater shortage of infrastructural resources, and they report overall lower levels of satisfaction among class parents and lower levels of parental involvement in their children’s schooling.<sup>15</sup>

### *Summary of Regression Results*

Overall, the results indicate, first, that teachers’ cream-skimming is directly related to a shortage of resources conceptualized as shortage of teaching time in the sample of all schools, and also the subsamples of public and private schools (see table 1). In addition creaming is directly related both to teachers’ assessment of parental satisfaction (in private schools) and to the percentage of parents engaged in their children’s schooling (in the whole sample and the public school sample). The findings provide little support, however, to the hypothesized link between a shortage of infrastructural and support resources and creaming. Further, there is no evidence of a

relationship between a managerial focus on academic standards and creaming. Finally, the relationship between teachers' teaching-time shortage and their creaming is moderated by the percentage of parents involved in private schools; in public schools the interaction term is significant only at the 10 % level. It is also worth noting that teachers' motivation for public service is not related to their creaming behavior. It is a very weak and insignificant predictor in the public school sample; in the private school sample the coefficient, though an imprecise estimate, has the correct sign and substantial magnitude.

Insert Table 1 about here

#### *Results for the Whole Sample (Models 1-3)*

The results for model 1 indicate that a shortage of teaching time is directly related to creaming ( $b = 0.141$ ,  $s.e. = 0.042$ ). Holding all other variables constant, a one standard deviation increase in this variable is associated with a 0.141 unit increase in creaming. The teacher's assessment of the percentage of class parents engaged in their children's schooling is also directly related to their creaming ( $b = 0.195$ ,  $s.e. = 0.095$ ). The inclusion of control variables in model 2 does not alter the substance of these results. But in addition, teachers' assessment of overall satisfaction among class parents, which was statistically insignificant in model 1, is now directly related to creaming but only at the 10 % level ( $b = 0.235$ ,  $s.e. = 0.140$ ), suggesting that the greater the perceived satisfaction among parents, the greater the priority given to teaching academically promising students.

Model 3 includes a multiplicative term to test the proposition that the direct relationship between teaching-time shortage and creaming is moderated by the

breadth of parental engagement in the school. The results indicate that no support for this proposition. In addition, the second indicator of shortage, related to infrastructural resources is now directly related to creaming but again only at the 10 % level.

We compare the impact of the main significant variables in two ways.

Standardized coefficients are often used as a handy way of comparison using a common metric. However, such comparisons are vulnerable to the size of the standard deviations of the variables being compared; in that sense the idea of a common unit of comparison can be misleading. Therefore, we also compare the impact of the variable across its full range in the sample using the unstandardized coefficient. In model 2, the standardized coefficient for the variable teaching-time shortage is 0.164, while that for the other statistically significant main variable in the model, percentage of parents taking an interest in their children's schooling, is 0.215. This would suggest, at first glance, that parents' involvement is a stronger predictor of creaming than teaching time shortage. However, a comparison of the effect of the variables across their full range contradicts this interpretation. The effect of teaching time shortage across its full range is 2.96 while that of parents' involvement is 0.937.<sup>16</sup> Next we examine whether the above results mask significant differences between public and private schools: Are the predictors of creaming different in these two institutions?

#### *Results for Public Schools (Models 4-6)*

The results (pooled models 4 and 5) are largely similar to the findings for the whole sample with regard to both teaching-time shortage and parental involvement. With the inclusion of controls in model 4, two more variables become significant, but at the 10 % level: shortage of infrastructural resources and parental satisfaction with the school.

These factors are all directly related to creaming. Next we examine the relative impact of the main significant variables, teaching time shortage and percentage of engaged parents, on creaming. In model 5, the standardized coefficient for the former is 0.159, while that for the latter is 0.186. This would indicate that parents' involvement is a stronger predictor of creaming than teaching-time shortage. However, this result is not supported by a comparison of the effect of the variables across their full range. The effect of teaching-time shortage across its full range is 1.36 while that of parents' involvement is 0.78. Model 6 includes the interaction term. The results show that the coefficient on the interaction term is positive and close to statistically significant at the 5 % level ( $b = 0.0084$ ,  $s.e. = 0.047$ ) suggesting the direct relationship between teaching time shortage and creaming becomes stronger as the level of parental engagement, measured by the percentage of parents involved in their children's education, rises. Figure 1 graphically illustrates this interaction effect and shows that as the degree of parental engagement increases the marginal effect of teaching-time shortage on creaming is strengthened. This reinforcing effect is statistically significant for most values of parental involvement in the sample, being insignificant only at very low levels of parental involvement.

Insert Figure 1 about here

#### *Results for Private Schools Only (Models 7-9)*

Given the small size of the sample of teachers in private schools ( $n = 64$ ), obtaining statistically significant results is more difficult. Nevertheless, these results are notably different from those obtained for public schools. First, although the coefficient on

teaching-time shortage is substantial and significant at the 10 % level in model 7, with the inclusion of controls in model 8, the coefficient shrinks drastically, changes sign and becomes insignificant ( $b = -0.059$ ,  $s.e. = 0.219$ ). In other words, teaching-time shortage does not explain teachers' creaming in private schools. Nor does the teacher-reported level of parental engagement, the coefficient for which is also insignificant. Second, and perhaps more interesting, the results for model 9 show that the coefficient on the interaction term is highly significant and *negative* ( $b = -0.0663$ ,  $s.e. = 0.206$ ), suggesting the direct relationship between teaching time shortage and creaming ( $b = 0.537$ ,  $s.e. = 0.241$ ) becomes *weaker* as the level of parental engagement rises. Figure 2 illustrates this interaction effect and shows that the greater the percentage of parents involved in their children's schooling, the weaker the direct relationship between time-teaching shortage and creaming. This effect is statistically significant for values of the parental engagement variable below the mean (i.e. at the lower end of the range). Third, the inclusion of the interaction term in model 3 also renders Parental satisfaction with schooling significant ( $b = 0.855$ ,  $s.e. = 0.355$ ) lending support to the idea that parental satisfaction as perceived by teachers can motivate their creaming.

Insert Figure 2 about here

## DISCUSSION AND CONCLUSION

There is considerable quantitative research on creaming, most of which focuses on the organizational level and on creaming as a discrete phenomenon. In contrast, ideas as

to how and why individuals resort to creaming have been generated primarily by a few qualitative studies and have so far not been tested quantitatively. This study filled this gap, drawing primarily on the literature on street-level bureaucracy. School teachers provide an excellent illustration of the job characteristics of SLBs (Meyers and Nielsen 2012; Nielsen 2011; Winter and Nielsen 2008). These characteristics have clear consequences, among them the exercise of discretion, the need to ration scarce resources and, in particular for teachers, the joint (and collective) production of services with their clients (students and parents). These factors are prerequisites for creaming in the classroom, which is another manifestation of how teachers are street-level policy-making agents (Anagnostopoulos 2003; Lipsky 1980; Golstein 2008).

#### *Summary of Findings.*

What factors explain why some teachers cream more than others? First, consistent with previous findings (Lipsky 1980), the cream-skimming behavior of teachers in the classroom is directly related to their workload, operationalized here as a shortage of time to achieve syllabus goals. The lack of teaching-time is a summary manifestation of the many challenges facing teachers, which arise from inadequate resources and training to teach a heterogeneous student body in a context marked by increasing – and institutionally driven – demands for parental involvement. Teachers deal with these challenges by using their discretion to prioritize those students they perceive as high achievers. A closer examination reveals, however, that this overall result holds only for public schools. In private schools, teaching-time shortage is associated with creaming only in classes where parents are less engaged in their children's education.

Second, creaming in the classroom is unrelated to the expectations of school management regarding students' performance. Teachers' beliefs about whether management focuses on academic performance does not translate into their favoring academically promising students. A plausible explanation for this is the weak and unclear linkage between the academic performance expectations of management, which are defined at the school level, and creaming in the classroom. This is because, as described above when deriving proposition 2, while performance can be assessed for the school as a whole and be used to compare schools, creaming in this study takes place at the individual level. It is very difficult for the individual teacher to calculate how to cream strategically with a view to improving her class's, and through it the school's, performance. In addition, the incentives to achieve such performance standards tend to be unclear. In other words, the bureaucratic success criterion -- raising school academic standards -- cannot be directly linked to the individual behavior of teachers. Therefore it is not rational for teachers to cream students with a view to raising school academic standards. This leaves open the question of how students' "academic success" is understood by teachers and what role it plays in their professional identity. This is a promising question for future research.

Third, creaming is directly related to the breadth of parental engagement (only in public schools) and teachers' assessment of parental satisfaction (only in private schools). One explanation for these seemingly contradictory findings draws on differences between public schools and private schools with respect to, first, the level of and variation in the percentage of parents engaged in their children's schooling and, second, the different role played by parental satisfaction in the two school settings. The breadth of parental involvement in their children's schooling is on



average considerably lower in public schools and less uniformly so across these schools.<sup>17</sup> This in turn can be explained partly by the larger differences in socio-economic background among public- school parents. This line of reasoning suggests that parental engagement becomes a motor for discriminating among students and creaming in the class when engagement is relatively low with greater intra-class variation. In private schools, such engagement is relatively high and more uniformly so, presumably because of self-selection: parents actively choose to send their children to private schools. Partly for this reason and partly because private schools are much more dependent on attracting clients for their existence, teachers' perceptions of parental satisfaction with the education their children receive – who is dissatisfied and why? – can influence the extent to which they cream. In other words, private school teachers may be influenced to cream the students whose parents are more active and demanding clients and whose satisfaction therefore likely matters more for teachers.<sup>18</sup> This explanation should be tested more thoroughly in future research.

More generally, and drawing on the findings of Blasé (1987, 1988), Knudsen (2010), Lasky (2000) and Vincent (1996), our interpretation of these striking results is that not only does the degree of parental engagement vary, it is also perceived and reacted to differently by teachers. In all classes there are parents who are more involved in their children's education in various ways, such as engaging the teacher and preparing their children better for participation in learning. These parents are likely also more demanding and are therefore the clients teachers are more focused on satisfying and whose children teachers prioritize in their teaching. Such parents are typically from relatively advantaged backgrounds and are more skilled in engaging

with the school (Richter 2008). Parental engagement has both substantive and signaling value regarding the relative importance of the child in the eyes of the teacher. This value has likely risen over the past 10-15 years in the wake of public policy initiatives aimed at increasing parental involvement in and responsibility for their children's education. This interpretation is in line with Lipsky's (1980) argument that SLBs discriminate among clients on the basis of perceived differences in clients' "worthiness" or "deservingness" (see also Maynard-Moody and Musheno 2003).

The above interpretation may also explain the finding that, in contrast to public schools, the greater extent of parental involvement in private schools, the *weaker* the direct relationship between a teaching-time shortage and creaming. In private schools, the parent body is more homogeneous and has, as already noted, overall a higher extent of involvement in the children's education. Thus, rather than providing a means for teachers to differentiate between students (thereby acting as a motor for creaming), it may to some extent help reduce the pressure on teachers arising from a resource shortage. In other words, increasing parent involvement in private schools reduces the need and incentive for the teacher to deal with a resource shortage by prioritizing some students over others. It needs to be kept in mind, however, that this result is obtained in a small sample (64 teachers), and further research is needed to verify the consistency of this finding and our interpretation.

#### *Limitations of the Study.*

This study, similar to others explaining complex social phenomena, does not account for all the factors that could affect creaming. These factors include teachers' attitudes regarding their students, in particular those that distinguish among students in the class e.g., an attitude or belief that some students are more worthy of their services

than others. This could be because the students are smarter, more hardworking or are more needy. Another set of variables taps teachers' competence in class management and teaching differentiation, teachers' motivation and engagement. For example, a teacher who is poor at maintaining order and discipline in the class may simply choose to focus on the group of students who are more obedient. We have included as many theoretically relevant variables as possible to cover alternative explanations for why teachers cream, e.g., by including a variable measuring amount of time used to maintain order in the class. But these variables do not cover all the factors that can explain a complex phenomenon such as creaming. Our future research agenda includes developing a broader model of creaming, which includes other – more general - characteristics that cause creaming, such as teachers' personality characteristics, classroom management skills and attitudes towards students and their parents and towards their jobs.

Another weakness of the study is our indicator of creaming, which is measured using a single question. The indicator has strong face validity as it captures the essence of coping in a public services context: prioritizing some clients over others based on their potential for success on a selected parameter (academic performance). However, the indicator does not cover other aspects of this creaming, e.g., what forms such preferential treatment takes, how often it occurs, and how many students are creamed. That it is a challenge to probe such questions using survey methods (e.g., on account of strong social desirability bias), is evidenced by the fact that research on this phenomenon so far has been limited to surveys of students' perceptions of teachers' differential behavior of their classmates, classroom

observation studies and other qualitative methods. Our future research will continue our efforts to develop better survey measures of creaming in a school context.

The risk of common method bias is another weakness in this study. The dependent and independent variables in this study, including the central concepts of creaming behavior and teachers' perceptions of parents' satisfaction with and engagement in their child's education, are measured using the same survey source. This can result in a biasing of results that is caused by two variables exhibiting related measurement error owing to a common method, such as a single survey. Such bias could arise for a variety of reasons, e.g., social desirability issues, halo effects, item characteristics or primacy effects (e.g., Favero and Bullock 2015; Favero, Meier and O'Toole 2014; Jakobsen and Jensen 2015).

An additional weakness is that the measures are based on self-reports (the teachers themselves). It is however unclear what the strength and direction of such bias might be. Self-reports certainly can be subject to method effects but literature reviews have indicated that suspected biasing factors including social desirability (Ones et al. 1996) and negative affect and acquiescence (Spector 2006) do not have strong, consistent effects, i.e., in the same direction (e.g., Williams and Anderson 1994). One reason self-reports might be considered inferior is because of method effects, which decrease construct validity. Another reason is the belief that if two variables are self-reported, the relationship will be inflated. It might be argued that it is better to measure at least one of the variables with an other-report. However, rather than providing a more accurate estimate of true relationships among constructs, relationships estimated using different methods tend to be weaker and less accurate as compared to same-method correlations (Conway and Lance 2010).

There are no clear solutions to how to deal with any possible bias in our analysis. One could use alternative sources to measure these constructs, e.g., colleagues' ratings of teachers' creaming. However, using other-reports for self-referential perception constructs, which we employ in our analysis, is problematic for at least three reasons. First, the individual's perceptions may not translate into observable behaviors. Second, even if perceptions were translated into behaviors, others may not have the opportunity to observe these relevant behaviors. Third, valid measurement by other-reports requires the reporter to infer accurately the individual's specific perception and the specific value on that perception from the observation of the individual's behavior. In short, when assessing self-referential perception constructs, non-self-report measures are often inferior in validity compared to self-report measures. Therefore any other-source ratings of these constructs will be subject to as much if not more bias (Brannick et al. 2010; Dalal 2005; Frese and Zapf 1994, Podsakoff et al. 2003). Some scholars have argued that self-reports are clearly appropriate for job satisfaction and many other private events (Chan 2009).

These arguments also apply to the main constructs used in this study. Neither teachers' creaming behavior nor their attitudes is easily observable; they represent priorities and decisions that often take place in the minds of the teachers. In line with this argument, the most reliable source of knowledge regarding teachers' perceptions of their jobs, their clients and the efficacy of the system they work in and of how they cope with their jobs on a day-to-day basis is the teachers themselves. In addition to these considerations, we have sought actively to reduce the chances of self-report bias in a number of ways.<sup>19</sup>

We have also investigated to what extent the main explanatory variables are sensitive to the exclusion of variables that may be more vulnerable to contamination. The results are robust to the exclusion of these variables.<sup>20</sup> Teaching time shortage is a significant predictor of creaming regardless of the other variables included in the model. In addition, in both the all-schools sample and the public schools sample, the magnitude and significance of the variable Percentage of parents involved in their child's schooling increases slightly after all the standard control such as teacher's gender, education, experience are included. The same applies in the case of the variable Parental satisfaction with schooling in the private schools sample.

*Implications for Research on SLBs and Creaming.*

This study leaves untouched the ambiguous link that was identified, first, between performance standards and incentives and, second, between parents engagement in and satisfaction with their children's schooling, on one hand, and teachers' creaming, on the other. We have argued that teachers view parents, like their children, as "clients," and as such teachers may give parents special attention, routine engagement, or cursory dismissal. From the teacher's perspective, the line between the supportive, engaged parent and the demanding, over-functioning one is thin. How the teacher responds to the student based on their views of the family is complex, and the nuances of the relationship are best captured through qualitative approaches, including on-site observation. But they should also be probed using survey methods with a wider array of questions that tap teacher attributions of both students and parents. These topics should also be investigated in future research.

More generally, this study also highlights the fact that SLBs' behavior is a result of interaction with clients in the course of the joint and collective production of services and that, given their working conditions, such interaction is likely to lead to cream-skimming. This finding has implications for management. The literature on school management has typically looked at the effects of management on student academic performance, treating teachers as a black box. This means that we do not know how teachers, and teacher-student interaction in particular, mediate or moderate the effects of management. But the findings presented here, combined with what we know about the limited ability of management to monitor teachers in the classroom, suggest that management can ensure more equitable outcomes in schooling – and, more generally, in human services involving the collective production of services – by giving SLBs clear and consistent guidance about priorities in client interaction. In a classroom context this means, for example, helping teachers to improve their class management skills in order to increase time spent on purely learning-related activities on one hand, and, on the other, ensuring broader parental engagement in their children's schooling with a view to facilitating a more equitable outcome in the classroom.

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**Table 1. Summary of results of class fixed effects regression of creaming on resource shortage and other variables**

	ALL SCHOOLS (n = 320)			PUBLIC SCHOOLS (n = 256)			PRIVATE SCHOOLS (n = 64)		
	1	2	3	4	5	6	7	8	9
<i>Main explanatory variables:</i>									
Shortage of teaching time (std.) (H1)	0.141*** (0.042)	0.164** (0.051)	0.185** (0.060)	0.135+ (0.079)	0.174** (0.059)	0.272** (0.093)	0.202+ (0.108)	-0.059 (0.219)	0.537* (0.241)
Shortage of infrastructural, support resources (std.) (H1)	0.070 (0.096)	0.162 (0.099)	0.165+ (0.099)	0.057 (0.097)	0.186+ (0.102)	0.182+ (0.102)	0.147 (0.307)	0.132 (0.318)	0.181 (0.304)
Management expectations re academic standards (H2)	0.046 (0.115)	0.006 (0.110)	0.007 (0.110)	0.038 (0.118)	-0.052 (0.110)	-0.083 (0.115)	0.003 (0.374)	-0.088 (0.399)	-0.168 (0.387)
Parental satisfaction with school (1 - 5 = Much above avg.) (H3a)	0.169 (0.148)	0.235+ (0.140)	0.240+ (0.140)	0.174 (0.158)	0.267+ (0.145)	0.281+ (0.145)	0.182 (0.447)	0.583 (0.416)	0.855* (0.355)
Percentage of parents taking an interest in the schooling (H3a)	0.195* (0.095)	0.239* (0.093)	0.242** (0.093)	0.176+ (0.095)	0.203* (0.090)	0.215* (0.089)	0.350 (0.319)	0.473 (0.308)	0.425 (0.279)
Interaction: Shortage of teaching time x % engaged parents (H3b)			-0.036 (0.047)			0.084+ (0.047)			-0.663** (0.206)
<i>Control variables:</i>									
Index of public service motivation		-0.053 (0.155)	-0.054 (0.155)		0.004 (0.152)	0.000 (0.147)		-0.451 (0.570)	-0.673 (0.598)
Two dummy variables for teacher's type of education, ref. category is regular teaching training:									
'Merit-teacher' training (univ. degree + teaching diploma)		0.227 (0.384)	0.241 (0.386)		-0.181 (0.359)	-0.204 (0.358)		1.822 (1.271)	1.847 (1.222)
Other training		-0.112 (0.549)	-0.078 (0.559)		1.059** (0.353)	0.899** (0.325)		-0.446 (0.931)	-0.616 (0.879)
Diploma in pedagogy (dummy var.)		-0.339 (0.340)	-0.324 (0.345)		0.052 (0.327)	0.054 (0.326)		-2.273* (1.030)	-2.359* (1.100)
Teaches subject of specialization (Math./Danish) (dummy var.)		-0.277+ (0.167)	-0.288+ (0.167)		-0.117 (0.169)	-0.093 (0.174)		-0.527 (0.749)	-0.966 (0.728)

Continued on next page

**Table 1 continued**

	ALL SCHOOLS			PUBLIC SCHOOLS			PRIVATE SCHOOLS		
	1	2	3	1	2	3	1	2	3
Years of experience teaching subject to same group of students		-0.057 (0.046)	-0.056 (0.047)		-0.035 (0.052)	-0.037 (0.050)		-0.002 (0.103)	-0.055 (0.122)
Female teacher (dummy variable)		0.154 (0.186)	0.154 (0.186)		0.222 (0.177)	0.221 (0.176)		0.448 (0.584)	0.669 (0.547)
Teaches Mathematics (not Danish) (dummy variable)		0.560*** (0.140)	0.561*** (0.140)		0.644*** (0.131)	0.648*** (0.131)		0.172 (0.489)	0.297 (0.455)
Employed full-time (=1) (dummy variable)		-0.417 (0.384)	-0.428 (0.385)		-0.507 (0.312)	-0.524 (0.322)		-1.169 (1.269)	-1.515 (1.252)
Constant	1.962*** (0.665)	2.478* (0.983)	2.470* (1.004)	1.992** (0.674)	2.107* (0.920)	2.199* (0.929)	2.000 (2.510)	3.701+ (3.867)	4.375+ (4.128)
N	320	320	320	256	256	256	64	64	64
R <sup>2</sup>	0.058	0.194	0.195	0.053	0.248	0.257	0.091	0.393	0.458
Adj. R <sup>2</sup>	0.043	0.157	0.155	0.035	0.205	0.210	0.013	0.219	0.289
F	5.298	4.134	5.713	2.103	5.949	15.040	11.86	3.541	45.27

Note: The figures in the cells are unstandardized coefficients with cluster robust standard errors in parentheses.  
+ p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001



THE MARGINAL EFFECT OF TEACHING-TIME SHORTAGE ON CREAMING AT  
DIFFERENT LEVELS OF PARENTAL ENGAGEMENT

Figure 1 Public schools

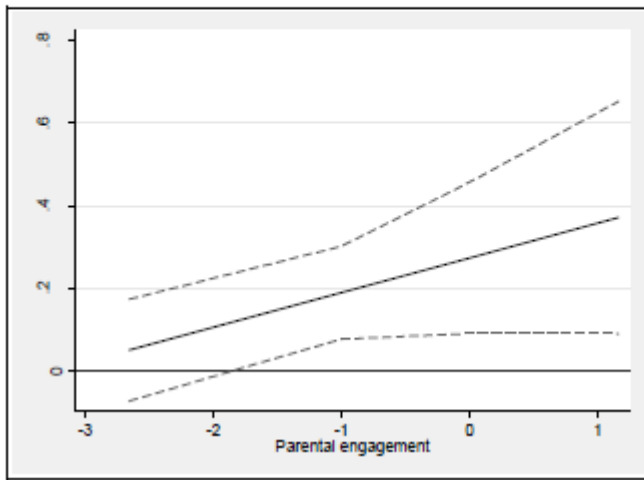
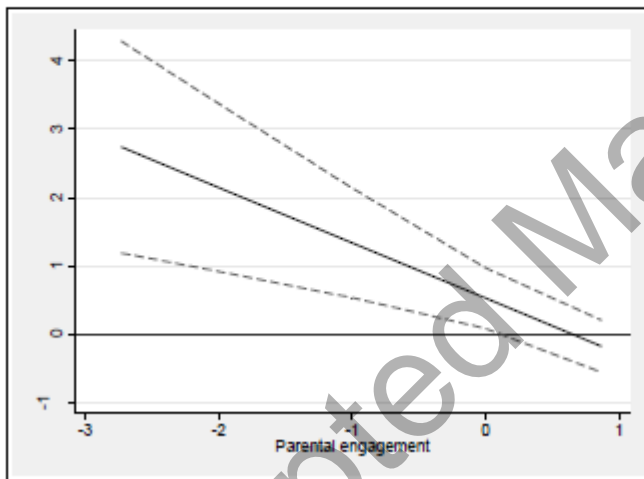


Figure 2 Private schools



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APPENDIX

Table A1. Summary statistics for variables in used in the analysis of creaming

Variable	ALL SCHOOLS (n = 320)				PUBLIC SCHOOLS (n =256)				PRIVATE SCHOOLS (n = 64)				Sig. test <sup>+</sup>
	Mean / %	S.D.	Min.	Max.	Mean / %	S.D.	Min.	Max.	Mean / %	S.D.	Min.	Max.	
Creaming: Priority to teaching academically promising students	2.80	1.13	1	5	2.81	1.09	1	5	2.73	1.26	1	5	NS
Shortage of teaching time (std.)	0	1	-0.46	15.55	0	1	-0.87	6.93	0	1	-0.30	7.60	NS
Shortage of infrastructural and support resources	0	1	-1.84	2.73	0.11	0.98	-1.84	2.73	-0.46	0.94	-1.84	1.75	***
Mgt. expectations re student performance(1 - 5 = Strongly agree)	3.36	0.92	1	5	3.31	0.88	1	5	3.58	1.08	1	5	NS
Level of satisfaction among parents of 9 <sup>th</sup> grade students	4.04	0.79	1	5	3.96	0.80	1	5	4.33	0.67	3	5	***
Parents engaged in their children's schooling (%) (std).	0	1	-2.75	1.1	0	1	-2.66	1.17	0	1	-2.73	0.87	**
Index of public service commitment	4.08	0.55	2	5	4.08	0.58	2	5	4.05	0.55	2.14	5	NS

Table continued on next page

Table A1 continued

Variable	ALL SCHOOLS (n = 320)				PUBLIC SCHOOLS (n =256)				PRIVATE SCHOOLS (n = 64)				Sig. test <sup>*</sup>
	Mean / %	S.D.	Min.	Max.	Mean / %	S.D.	Min.	Max.	Mean / %	S.D.	Min.	Max.	
Three dummy variables for type of education:													
Regular teacher training (%)	88.13	---	0	1	91.41%	---	0	1	75.00%	---	0	1	**
'Merit-teacher' training (univ. degree + teaching diploma) (%)	7.50	---	0	1	7.42%	---	0	1	7.81%	---	0	1	NS
Other training (%)	4.38	---	0	1	1.17%	---	0	1	17.19%	---	0	1	**
Diploma in pedagogy (dummy variable) (%)	12.19	---	0	1	12.5%	---	0	1	10.94%	---	0	1	NS
Teaches subject of specialization (Math./Danish) (dummy variable) (%)	74.38	---	0	1	76.17	---	0	1	67.19	---	0	1	NS
Years of experience teaching subject to same group of students	3.14	1.87	0	10	3.07	1.79	0	10	3.44	2.18	1	10	NS
Female teacher (dummy) (%)	56.56	---	0	1	57.03	---	0	1	54.69	---	0	1	
Teaches Mathematics (not Danish, dummy var.) (%)	50.00	---	0	1	50.00	---	0	1	50.00	---	0	1	
Employed full-time, dummy (%)	93.44	---	0	1	93.75	---	0	1	92.19	---	0	1	NS

\* Column reports results of significance test for difference in means / percentages between public and private schools: \* p<0.05, \*\* p<0.01, \*\*\* p<0.001; NS = not significant

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## NOTES

<sup>1</sup> However there is considerable qualitative literature on the phenomenon, albeit one that uses a different terminology. Studies in education have documented via classroom observation teachers' differential treatment of students through their verbal and non-verbal behavior, both at the individual and group levels and often in subtle ways (see e.g., Babad 1993, Babad and Taylor 1992).

<sup>2</sup> In the updated version of his book (2010), Lipsky slightly changed his notion of who is (and who is not) a SLB. He notes that "not every teacher, . . . , experiences the pressures that I stated street-level bureaucrats face by definition. Frontline workers whose jobs are relatively free of restrictive structural constraints will still develop routines in response to their work environments. But the routines will not be developed to with a difficult work environment" (Lipsky 2010: xvii). Lipsky thereby implicitly acknowledges that a chronic shortage of resources is not a defining criteria of an SLB and that the routines SLBs employ can also be influenced by other factors, such as attitudes.

<sup>3</sup> In their recent conceptualization of "coping" based on a systematic review of the literature on the concept, Tummers and his colleagues (2015), drawing on the classification system of Skinner and her colleagues, identify three distinct families of coping: moving towards, away from and against clients, respectively. They classify creaming (which they refer to as "prioritizing") as part of the coping family "Moving towards clients" and in the sub-category "Prioritizing among clients", which they describe as "Giving certain clients more time, resources, or energy" (Tummers et al. 2015). (They use the term "prioritising" instead of "creaming" on the grounds that the latter term has a negative connotation.) However, prioritizing is not only about moving towards clients, it is also about moving away from clients. Prioritizing by definition means giving one thing precedence over another. Following this line of reasoning, creaming is a form of rationing, which is defined as "decreasing service availability, attractiveness, or expectations to clients or client groups") and thus also belongs to the coping family "Moving away from clients".

<sup>4</sup> Definitions of creaming can vary but their essence remains the same: the selection of clients on the basis of given performance standards and the accompanying incentives (either explicitly provided or arising naturally from these). For example, Heinrich (1999) summarizes a number of studies that found that incentives generated by cost-per-placement standards in employment agencies have led to increased provision of short term, less intensive services, an emphasis on immediate placements, and the selection of more job-ready participants who require less training. Mukamel et al. (2009) find some evidence that nursing homes responded to the publication of a national quality report card for nursing homes by adopting cream skimming admission policies; similarly Berta et al. (2009) examine cream-skimming in response to a prospective payment system in the health care sector in Italy and find that private hospitals are involved in cream skimming at a much higher rate than public and not-for-profit ones.

<sup>5</sup> Information from Ministry of Education: <http://uvm.dk/Administration/Tilskud-til-institutioner/Fakta-om-taxametersystemet-og-tilskud-til-institutionerne>.

<sup>6</sup> Such behavior may also be facilitated by the Danish scale of assessment: -2, 0, 2, 4, 7, 10, 12 and where 0 or below means failed. In the conditions described above, a teacher may for example choose to focus on improving the performance of those scoring around 7 or 10 at the cost of those scoring 0 or -2 because of the lower bound. There is more to be gained in improving the performance of 7-scorers (e.g. a 3 point increase up to 10) than to prevent those scoring 2 or 0 to slipping a level (a 2 point drop).

<sup>7</sup> The specifics of the performance measure might make a difference in some systems. For example, in testing systems in the U.S., often the metric employed is overall pass rate for a classroom (or grade) rather than average score on the exam. The latter might encourage more creaming than the former, or the former might even encourage reverse creaming to get several marginal students above the threshold.

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<sup>8</sup> Scholars generally recommend listwise deletion instead of pairwise deletion. As Allison (2009) explains, pairwise deletion allows you to use more of your data. However, each computed statistic may be based on a different subset of cases. This can be problematic. This procedure is sensible if (and only if) the data are randomly missing. In this case, each correlation, mean, and standard deviation is an unbiased estimate of the corresponding population parameter. This is very rarely the case. If data are not missing at random (the typical scenario), several problems can develop: The pieces put together for the regression analysis refer to systematically different subsets of the population, e.g. the cases used in computing the correlation between variables 1 and 2 ( $r_{12}$ ) may be very different than the cases used in computing  $r_{34}$ . As a consequence, results cannot be interpreted coherently for the entire population or even some discernible subpopulation. The more common problem, however, is the difficulty in getting accurate estimates of the standard errors. That is because each covariance (or correlation) may be based on a different sample size, depending on the missing-data pattern. Listwise deletion in contrast has the disadvantage that it often discards a great deal of potentially usable data. On the one hand, this loss of data leads to larger standard errors, wider confidence intervals, and a loss of power in testing hypotheses. On the other hand, the estimated standard errors produced by listwise deletion are usually accurate estimates of the true standard errors. In this sense, listwise deletion is an 'honest' method for handling missing data, unlike some other conventional methods. For these reasons, listwise deletion is generally recommended instead of pairwise deletion.

<sup>9</sup> The internal consistency of the variable as measured by Cronbach's alpha was 0.60, 0.57 and 0.60 for the full sample, the public schools sample and the private schools sample, respectively.

<sup>10</sup> The internal consistency of the variable as measured by Cronbach's alpha was 0.75, 0.74 and 0.75 for the full sample, the public schools sample and the private schools sample, respectively.

<sup>11</sup> The eight items loaded on two separate factors, compassion and public service commitment. Including these separately in the model did not make a substantive difference to the results. Therefore they were included as one overall indicator of commitment to public service.

<sup>12</sup> The internal consistency of the variable as measured by Cronbach's alpha was 0.79, 0.80 and 0.77 for the full sample, the public schools sample and the private schools sample, respectively.

<sup>13</sup> Attempts to estimate the models using ordered logit with fixed effects failed as the models failed to converge.

<sup>14</sup> In addition to the analysis underlying the results in table 1, we ran several models with different specifications in order to test a range of interaction effects, e.g. whether the relationship between resource shortage and creaming was moderated by teachers' assessment of their relationship with parents or by school management's expectations regarding students' academic performance. None of the tested interaction effects was significant.

<sup>15</sup> One way of indirectly assessing the validity of these measures is to see how they correlate with related measures from other sources. The measure of time constraints correlates .13 ( $p < .05$ ) with a measure of the socioeconomic composition of the class generated from administrative data, indicating that the lower the proportion of the class ranked among the top 50% of all students in the dataset with respect to parents' SES, the greater the creaming. We can also validate the measure of academic expectations by comparing the responses of teachers' teaching the same class to the same question. 30 % of the responses match and of those that are different, more than 75 % have only a one unit difference on the scale; in addition, the teachers' responses on one of the two items (performance in exams compared to other schools) correlate well to that of their principal (0.32,  $p < .001$ ).

<sup>16</sup> This is calculated as follows: Range of variable teaching time shortage = 16.01 (from -0.46 to 15.55), unstandardized coefficient ( $b$ ) = 0.185. Therefore effect of the variable across its full range in the sample (i.e., as it moves from its minimum value to its maximum value) =  $16.01 \times 0.185 = 2.96$ . Range of variable parental involvement = 3.85 (from -2.75 to 1.1), unstandardized coefficient ( $b$ ) = 0.242. Therefore effect of the variable across its full range in the sample =  $3.85 \times 0.242 = 0.932$ .

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<sup>17</sup> In our data, the (teacher-reported) percentage of engaged parents in public and private schools is on average 69.82 (std. deviation: 25.89, range: 1-100) and 79.40 (std. deviation: 23.59, range: 15-100), respectively, a difference of almost 10 percentage points.

<sup>18</sup> In these conditions, teachers' public service motivation in the form a focus on the needs of *all* students may have a greater role to play as a counteracting force. As noted above, the PSM coefficient for private school teachers, though insignificant, has the correct sign and substantial magnitude. This result deserves further investigation in future studies.

<sup>19</sup> First, the survey items used to construct the dependent and main explanatory variables are spaced out across the survey, worded very differently and with different response choices, and cannot be examined simultaneously given web interface. E.g., the item measuring creaming behavior (the dependent variable) is question 22 in the survey (response choice on a scale from Strongly disagree to Strongly agree), the index of infrastructural resource shortage (H1) is constructed from question 9 (response choices from Not at all to To a very large extent) and the measures of parental involvement and satisfaction (H3) are questions 35 and 36. Parental involvement is indicated by a single number, chosen by the respondent to indicate the percentage of parents in the teacher's class who take an interest in their child's schooling. Parental satisfaction is one item in a battery of four (the first three of which deal with students' academic level and well-being) and with response choices from Much below average to Much above average. Teachers' beliefs about school management's expectations regarding academic standards (H2) is formed by summing two items worded differently and spaced widely apart in the survey and with different question formats: one in the form of two statements anchoring opposite ends of a five-point scale and the other in the form of a single statement with a five point response scale going from Strongly disagree to Strongly agree. Thus, there is no similarity between wordings of dependent and independent variables that should give great cause for concern.

In addition, we have wherever possible chosen measures based on questions that elicit concrete information from the respondents to increase reliability and validity. E.g., the variable measuring teaching time shortage is constructed from a battery of four items that ask the respondent to provide more precise information in the form of an estimate of the proportion of lesson time used on different activities such as maintenance of order in the class, teaching, administrative practical tasks. We have intentionally avoided asking teachers directly about their workload, e.g., in the form "On a scale of 1-5, where 5 = very high, how high do you think your workload is? Or in the form "I do not have enough time to finish my duties", respond on a scale from 1-5, where 1 = strongly disagree to 5 = strongly agree.

Response set issues should be minimal given that the survey questions do not involve sensitive topics such as violent or aggressive behavior, substance abuse, or sexual practices. Further, the survey was administered by mail by a well-regarded research institution, which ensured anonymity and increased the respondents' trust regarding the purpose of the data collection. An examination of responses to individual items did not reveal any patterns suggesting a response set.

<sup>20</sup> Teaching time shortage is a significant predictor of creaming regardless of the other variables included in the model. In addition, in both the all schools sample and the public schools sample, the magnitude and significance of the variable Percentage of parents involved in their child's schooling increases slightly after all the standard control such as teacher's sex, education, experience are included. The same applies in the case of the variable Parental satisfaction with schooling in the private schools sample.