The Irony of Accountability:
How a Performance-Inducing Policy Reduces Motivation to Perform

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THE IRONY OF ACCOUNTABILITY: HOW A PERFORMANCE-INDUCING POLICY REDUCES MOTIVATION TO PERFORM

Abstract

Organizations have often used data and instituted accountability practices to improve performance by optimizing individual and organizational behavior. While research has focused on the impact of quantification on behavior, the increasingly important aspects of wellbeing and motivation are often ignored. However, the dynamics and politics of quantification can have important consequences to internal personal processes, over and beyond external observable actions. Using the case of US education that has long relied on accountability policies, we find that attendance in schools with test-based accountability predicted lower student self-efficacy, i.e., decreased task motivation and resilience as well as increased fear of failure—salient for low-income, urban, and public schools. These associations, however, did not spill over to social and life satisfaction dimensions of wellbeing. Taken together, these suggest the irony of accountability, where data used to induce performance may unintentionally reduce people’s motivation to perform—particularly consequential in disadvantaged contexts. This paper attempts to contribute to a broader theorization of quantification, affecting not only external behaviors and interpersonal relations but also internal personal dispositions. Finally, the paper also provides implications for the study of wellbeing, organizations, and education policy.

Keywords: quantification, accountability, education, wellbeing, organizations

THE IRONY OF ACCOUNTABILITY:

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Private and public organizations have so often relied on data and quantitative metrics to promote efficiency and optimize performance (Marshall, Mueck, and Shockley 2015; McAfee and Brynjolfsson 2012; Schildkamp 2019). Businesses track workers' productivity, corporations measure customer satisfaction, and governments set up accountability systems and surveillance mechanisms—all of which have been growing through new technologies and greater confidence in big data and other algorithms (Brayne 2017; Ranganathan and Benson 2020; Sauder and Espeland 2009). Scholarship on organizations in general, and quantification in particular, has interrogated how behaviors and social relationships are structured, changed, and transformed by performance measures, cost-benefit analyses, inter-organizational rankings, company ratings, and other forms of numerical assessment (Colyvas 2012; Martens and Niemann 2013; Mennicken and Espeland 2019). These studies highlight how different forms and processes of quantification impact individual behaviors, interpersonal relationships, organizational priorities, and inter-firm competition (Kaivo-oja et al. 2015; Oswald et al. 2020). While the intention is for objective measures to promote efficiency, critical studies have documented counterproductive effects in terms of corrupted measures, gaming strategies, destructive categorizations, and enhanced inequities (Campbell 1979; Figlio and Getzler 2006; Sadowski 2019; Safransky 2020). In these studies, the theorization has centered on how the form, context, and scope of quantification influences behavioral and organizational consequences (Mennicken and Espeland 2019).

However, this focus on observable behavior may mask changes that take place within an individual, with aspects such as self-concept, motivation, and wellbeing. While performance-inducing, quantitatively-focused policies may promote behavioral compliance, it may come at the cost of people's mental health and personal motivation (Cäker and Siverbo 2018; Mitchell et al. 2018). Such is particularly important as institutions and companies are more attentive to organizational climate and personal wellbeing, highlighting that a positive environment can have longer-term impacts on performance and productivity (Bache and Scott 2018; Warr and Nielsen 2018). Although wellbeing and motivation are key aspects of organizational life, quantification studies are relatively limited to qualitative research on work pressure and anxiety, and have yet to explore different dimensions of wellbeing and human development (Espeland and Sauder 2016; Goren 2012; Stevenson 2017). Thus, this research broadly asks how performance metrics affect wellbeing and intra-personal dispositions.

Given the importance of wellbeing in organizations and the need to attend to how quantification regimes may potentially affect it, we investigate this with the case of a dominant quantification policy in a field that has long used this strategy, i.e., test-based accountability in US education. Using students' test scores for accountability has been common in the United States, with its pinnacle being the 2001 *No Child Left Behind* policy. However, the form of accountability differs immensely, with some districts using these measures merely for information, others using them for school incentives, and others using them for consequential teacher evaluation and employment (Hursh 2007). In this research, we ask particularly how the practice of test-based teacher accountability in a school may be linked to different dimensions of student wellbeing, and how this link is sustained in different school contexts.¹ While accountability's impact on student performance is theorized to work because of how incentives are set up to encourage teachers to

focus on instruction (Ingersoll and Collins 2017), this focus may inadvertently hurt the environmental climate as teachers concentrate on student performance rather than mastery, as students are pressured to perform well in narrowly set exams, and as a culture of fear is fostered for a school's potential poor performance (Conley and Glasman 2008; Schoen and Fusarelli 2008).

To preview the results, we found that accountability was linked to reduced performance motivation but not to other dimensions of wellbeing, and that this finding was salient in relatively disadvantaged contexts such as low-income, public, and urban schools. With these results, we explore and discuss how quantitative mechanisms of control may be detrimental to personal motivation, especially in contexts of greater disadvantage. This finding is important in at least three ways. First, while studies have shown the supposed learning gains on students' performance with the advent of accountability policies (Figlio and Loeb 2011; Hanushek 2019), this present research suggests the potential collateral consequences for students' motivation and self-efficacy. Second, while qualitative studies have focused on teachers' resistance and fear of these policies (Hallett 2010; Lingard 2021), this quantitative study suggests that such climate of demotivation and anxiety are also experienced by students. Third, while quantification studies have highlighted the consequences on observable behaviors and organizational structures (Espeland and Sauder 2016; Mennicken and Espeland 2019), this research motivates a new line of inquiry that attends to people's internal states.

Although the case of accountability in US education may be just one particular institutional context, the study offers an important consideration for how specific forms of quantification within particular contexts are linked to internal personal dispositions, in addition to external observable actions. By opening a line of inquiry between sociology and human development, this study contributes to the literature on quantification in organizations—particularly regarding how the

practice of accountability can be consequential to people's wellbeing and motivations. It seeks to further the theorization of quantification as crucial not only for observable behaviors, interpersonal relationships, and organizational structures, but also for often-invisible personal dispositions. Moreover, it has implications for policy scholars studying the consequences of policy designs, and educational researchers investigating and seeking to improve accountability systems.

Literature Review

Quantification in Organizational and Individual Performance

Organizations have long used data, quantitative information, and performance metrics to create efficiencies and to improve profit, service, ranking, or other indicators of success. For example, governments and states have been using censuses for thousands of years; corporations have used double-entry bookkeeping for hundreds of years; and profit-driven firms have been monitoring work and worker performance for decades—and all these continue with even greater sophistication and precision (Carruthers and Espeland 1991; Mennicken and Espeland 2019; Waring 2016). Studies have also kept pace in terms of investigating how the form, context, and supposed legitimacy of metrics associate with consequences for individual and organizational behaviors and relationships. For example, university rankings—widely debated yet still ever present—have consequences for university decisions and resources, staff work and pressure, student performance and inequality, donor relationship and support, and other aspects within and beyond the institution (Espeland and Sauder 2016; Hazelkorn 2015).

Often, these supposedly objective metrics can provide information on organizational inefficiencies, support evidence-based decision-making, evaluate program interventions, predict human behavior, institute mechanisms of accountability, and provide legitimacy to human

discretion (Bovens, Goodin, and Schillemans 2014; Brayne 2017; Colyvas 2012). A sense of rationalization permeates both private and public organizations, and quantification through audits and evaluations has had an important role to play in this (Hwang and Powell 2009). Seen as critical in managing firms, using numbers has become so natural and institutionalized that organizations forego it at their peril. In general, data and information are thought as important components of organizational life and functioning, helpful in optimizing the individual and the firm's performance (Marshall et al. 2015; McAfee and Brynjolfsson 2012). Yet the use of these numbers can itself lead to detrimental consequences in terms of perverse incentives, gaming strategies, cheating, and categorical inequalities (Domina, Penner, and Penner 2017; Hibel and Penn 2020; Neal and Schanzenbach 2010). In a now classic formulation, Campbell (1979:85) wrote:

The more any quantitative social indicator is used for social decision-making, the more subject it will be to corruption pressures and the more apt it will be to distort and corrupt the social processes it is intended to monitor.

Such processes are seen in higher education, policing, health care, and government statistics—where incentives and penalties are created with quantitative indicators, and organizations fixate at the indicators rather than the improvement principles behind them (Brayne 2017; Hazelkorn 2015; Poku 2016).

However, it is not so much the mere presence of numbers or the process of quantification that affects behavioral and organizational changes, but its form, function, and context. For example, public organizations institute accountability practices that take many forms, with some measuring inputs through public spending transparency (Douglas and Meijer 2016) while others

measuring outcomes like students' test scores (Figlio and Loeb 2011). Even within similar forms of data collection, differences in function happen, like when test scores are utilized either to provide information to the public (Diaz Rios 2020), to incentivize schools and determine failing ones (Bifulco and Schwegman 2020), or to measure, reward, and sanction teacher performance (Ingersoll and Collins 2017). More importantly, the context of quantification matters such that contexts that have not had such systems of accountability can experience turmoil when shifting to this practice (Hallett 2010). Taken together, the literature explores how different forms, functions, and contexts of quantification influence people and organizations' behavior, performance, and relationships. Yet, the literature seems to ignore more intrapersonal processes potentially implicated in such systems.

Organizations and Social Psychology: Wellbeing and Stress

While organizations are still concerned with people's performance, they are also expected to attend to people's subjective wellbeing—inclusive of meaningful work, positive climate, life satisfaction, and social belonging (Veenhoven 2008). Organizations have been instituting wellness programs, flexible policies, corporate counseling services, and other programs aimed at improving people's psychological and mental health (Ryan et al. 2021; Kirk and Brown 2003). Organizational studies have also been more interested in topics such as meaningful work, “calling” identities, and flexible work structures that affect subjective wellbeing (Bloom, Colbert, and Nielsen 2020; Bunderson and Thompson 2009; Gonsalves 2020).

While the concept of wellbeing is not a major sociological concern, given the discipline's focus on social problems and observable behaviors, it is attracting greater scholarly attention for several reasons. First, individuals' wellbeing and sense of engagement are associated with positive

outcomes such as lower turnover, higher task effort, and improved organizational performance (Shuck, Relo, and Rocco 2011). Second, and in contrast to the first, sociologists have interrogated the experience of stress in workplaces, particularly as it can affect burnout and interfere with an individual's nonwork life (Moen et al. 2016; Schieman, Glavin, and Milkie 2009). Finally, emotions, feelings and wellbeing are no longer just understood as individual psychological phenomena because of research documenting emotional contagion among groups of people (Coviello et al. 2014). These recent studies highlight the need and promise of attending to concepts of wellbeing and human development in organizational and sociological studies.

Studies on quantification have been attentive to some aspects of wellbeing. Espeland and Sauder (2016), for example, document how university administrators, staff, and students feel pressure, and exhibit reduced or increased morale from the publication of law school rankings. Feelings of dehumanization—of being like cogs in a machine—mark workers who are under constant surveillance, such as U.S. transportation security officers monitored by a “system of cameras, testing, and observation” (Anteby and Chan 2018:8). Feelings of fear and anxiety are also routine experiences for public school teachers in disadvantaged schools, concerned about their evaluation and the metrics used to monitor their performance (Conley and Glasman 2008). Mainly qualitative in nature, these studies show how particular forms of quantification can influence reduced wellbeing.

These studies also provide a suggestion for how the supposed organizational improvement and efficiency may come at the expense of people's mental health—a critical intersection between the studies of organization, quantification, and social psychology. As individuals experience stress in their organizational environments, such experiences may lead to racial-ethnic and social class inequities in physical and mental health—stemming from racially and economically segregated

jobs and organizational contexts (Thoits 2010). Thus, organizational processes of quantification can be considered a critical locus for investigating proximal processes that help reproduce these social inequities.

While these studies suggest important consequences of quantification, three questions remain: First, what particular form of quantification is associated with decreased wellbeing? It is unlikely that every organizational use of data has implication for wellbeing, and so, we focus on a system that has proliferated in various public organizations: accountability (see Bovens et al., 2014). Second, are there specific aspects of wellbeing affected? While most sociological studies mentioned in the previous paragraphs highlight pressures and anxieties, wellbeing is understood as multi-dimensional (Veenhoven 2008). Thus, it is important to nuance which specific aspects of wellbeing are linked to quantification processes. Third, how do we measure this systematically? Studies have often relied on rich qualitative cases, and our present research extends this by suggesting quantitative methods to see the link between quantification and wellbeing.

Case of U.S. Test-Based Accountability

Accountability policies in public organizations can span forms as varied as ethical, financial, democratic, and performance accountability—all of which require the use of data to hold account to the public (Fard and Rostamy 2007). One crucial and expansive case of accountability is that of U.S. education's use of tests to measure the performance of schools and teachers, which may include consequent incentives and sanctions in the form of pay increases, added resources, or threats of school closure or teacher dismissal (Figlio and Loeb 2011; Ingersoll and Collins 2017). While studies have suggested accountability's positive effects in terms of increases in standardized test scores, academic performance, and post-secondary outcomes (Chiang 2009; Deming et al.

2016; Hanushek 2019), studies have also documented how different forms of accountability influence gaming strategies, school cheating, and increased inequalities (Diamond and Spillane 2004; Hibel and Penn 2020; Neal and Schanzenbach 2010). In the United States, pressures for schools to attain adequate yearly progress have provided an example for Campbell's (1979) thesis about the corruption that stems from indicators such as high-stakes tests. To attain these indicators, some schools have focused instruction on students at the threshold of passing exams or reclassified students as disabled to prevent them from taking standardized exams (Figlio and Getzler 2006; Jennings 2005)

In many of these studies, the focus has been mainly on students, teachers, or organizations' behavior and performance. Often, quantitative studies use difference-in-differences or regression discontinuity designs to compare the outcomes of students who were in schools that instituted test-based accountability and those students in schools that did not have it (Bifulco and Schwegman 2020; Chiang 2009; Dee and Jacob 2011). Multilevel and structural equation models, on the other hand, were more common in investigating teachers' behavioral responses to such systems (Hibel and Penn 2020; Ryan et al. 2017). Furthermore, qualitative studies focus on the experience of teachers and school administrators, often facing pressure and turmoil with new accountability systems (Diamond and Spillane 2004; Hallett 2010). Little, however, has been done in terms of quantitatively interrogating how school accountability predicts students' wellbeing, which has implications for how an organizational policy might affect not only behavior and performance but also internal personal processes.

We focus on student wellbeing rather than teacher wellbeing for two reasons: First, we want to know if the influence of accountability goes beyond those for whom it was initially directed, i.e., teachers and staff. We hypothesize that these policies can influence school climate

over and beyond the individuals monitored. It is an empirical test and extension of Golann's (2015) qualitative observation in a No-Excuses charter school that the emphasis on raising test scores can undermine students' wellbeing as they closely monitor themselves, hold back their opinions, and defer to authority. We suggest that such sentiments can lead reduced motivation and increased fear that can be evident in schools induced with accountability. Second, studies on accountability have focused on students' supposedly improved performance without interrogating their internal dispositions, thus necessitating the investigation into a potential collateral consequence of accountability.

A policy that uses test scores to measure student performance and incentivize teachers and schools may be potentially useful for motivating better instruction (Hong and Hong 2021; Means, Padilla, and Gallagher 2010) but it may also lead to a focus on comparability and heightened pressure to perform (Smeding et al. 2013). In other words, it may lead to a focus on quantified and quantifiable performance rather than the mastery that these forms of quantification supposedly measure. In this study, we explore the irony of accountability, where a policy that focuses on performance may unintentionally reduce organizational actors' motivation to perform. In our case, we test:

Hypothesis 1: Test-based teacher accountability is negatively associated with measures of self-efficacy, inclusive of task motivation, resilience, and fear of failure.

However, we also investigate whether this form of accountability may also influence other aspects of wellbeing such as life satisfaction and social belonging. On the one hand, quantification may affect different domains of subjective wellbeing, given the increased stress and pressure felt within

organizations (von der Embse et al. 2016). On the other hand, consequences may be more domain-specific as they are limited to aspects of performance rather than general wellbeing (Veenhoven 2008). For the case of accountability in schools, we test this latter hypothesis:

Hypothesis 2: Test-based accountability is neither positively nor negatively associated with other domains of wellbeing such as life satisfaction and social belonging.

More importantly, we try to investigate if this happens equally across different contexts. One interesting prospect is to see if the negative association between accountability and motivation was significant in disadvantaged contexts. For example, Diamond and Spillane (2004) show how probationary and disadvantaged schools respond differently to accountability policies, as they felt more undue pressure from it. Thus, we hypothesize:

Hypothesis 3: Test-based accountability remains negatively associated with measures of self-efficacy in disadvantaged contexts.

Data and Methods

The study used the United States data from the 2018 Programme for International Student Assessment (PISA), which had a two-stage stratified cluster sampling design, where a random sample of schools nationwide were first selected before selecting a random sample of 15-year-old students within the school (Rutkowski and Rutkowski 2016). Administered by the OECD, or Organisation for Economic Co-operation and Development, this triennial program included data on students' standardized test scores in mathematics, reading, and science; measures of student

socioeconomic status and wellbeing; students' beliefs and behaviors; and teachers' and principals' answers to survey questions. In 2018, PISA included more than 600,000 15-year-olds across 79 countries or administrative regions, but this research is initially limited to investigating test-based teacher accountability in the United States.

The analytic sample included 4,371 students (49% female) within 147 schools.² Missing values were imputed to preserve the cases where some variables were absent. However, 17 out of the original 164 schools were not included because they did not have any school-level information, making imputation for school-level variables difficult. This is particularly important since the main explanatory variable is school-level accountability, which we assume to be exogenous to student characteristics as logistic regressions show no association between accountability and student-level variables. Thus, although the original sample was designed to be nationally representative of 15-year-old students, we are circumspect with arguing that our research has preserved this representativeness. Nonetheless, among the 147 schools that were retained, we maximized the analytic power by imputing missing values (Royston 2004).

Measures

Test-based teacher accountability was a dichotomous variable coded 1 if a school used standardized student tests for evaluating and making judgement about teachers' effectiveness. This definition of accountability emphasizes the role of performance standards (i.e., tests), teachers' evaluation using these standards, and concomitant rewards and sanctions for passing or failing (Ingersoll and Collins 2017). While this form of accountability can itself show up in different forms and with different gravity (e.g., some schools use it to fire teachers while others merely include it for evaluation), our data cannot further disambiguate the specific form and magnitude

of the school's practice of test-based teacher accountability. Nonetheless, we highlight that this indicator is the most appropriate one for our current investigation, given the data we have. This indicator also provides a more intuitive interpretation than if we had a continuous or categorical indicator of the type of accountability practiced in a school.

Student wellbeing was a multidimensional construct with different components such as belonging, life satisfaction, and task motivation. In PISA 2018, different indices were available to indicate students' subjective wellbeing (OECD 2019c). These Warm likelihood estimates (WLE) used item parameters from all students from equally weighted countries, but we standardized them so that the mean value of the US student population is zero with a standard deviation of one.³ Each individual had a WLE in a particular wellbeing index, with higher scores indicating greater experience of the quality being measured (e.g., greater satisfaction). Unlike test scores that differ across contexts, these survey questions were similar across countries and the indices we included exhibited within-country validity and cross-country comparability (OECD 2019a).

The present study used the PISA framework for the analysis of student wellbeing, particularly in terms of grouping the different indices into three aspects of wellbeing: personal efficacy, life satisfaction, and social wellbeing (OECD 2020). For *personal efficacy*, we included WLE measures of task motivation, resilience, and fear of failure. For the *satisfaction* dimension, we had measures of positive feelings and life satisfaction while for the *social* dimension, we included students' sense of belonging and perception of competition. Table 1 presents the different dimensions of wellbeing, the included indices, their descriptions, and example survey items.

<INSERT TABLE 1 NEAR HERE>

Control variables were included in order to isolate the potential relationship between teacher accountability and wellbeing. *Student-level control variables*, such as sex, socioeconomic

status (SES) and standardized test scores, were added since these may independently predict subjective wellbeing. A dichotomous variable for sex was recoded with 1 indicating Female and 0 Male. The SES index was a composite variable from the 2018 PISA that included parents' highest educational attainment, parents' highest occupational status, and home possessions (OECD 2019b). This was standardized to have a mean of zero for an average OECD student. Since students' level of academic achievement may be associated with subjective wellbeing, controls were added in terms of students' standardized mathematics, reading, and science test scores, which adhered to the general Rasch item response theory model and had been standardized for OECD countries with a mean of 500 and standard deviation of 100 (OECD 2019b).

School-level control variables included the school type, school context, and mean socioeconomic index of the students. We had dichotomous variables for attendance in a public school (1=public, 0=private), defined as students not paying tuition for schools, and attendance in an urban school (1=urban, 0=non-urban), defined by PISA as being in a community of more than 100,000 people. The school-level SES index was created by averaging the SES indices of the students in a school.

Analytic Approach

The research asked how test-based teacher accountability predicted different facets of student wellbeing, with a particular focus on its association with indicators of personal efficacy. In particular, we hypothesized that the presence of test-based accountability was associated with reduced motivation to perform. To test the hypothesis, we employed hierarchical linear models to examine how school-level accountability practice may associate with student-level wellbeing indicators (Raudenbush and Bryk 2002). Formally, we specify the model as:

$$Y_{ij} = \beta_{0j} + \sum_{k=1}^K \beta_{kj} X_{kij} + e_{ij}$$

$$\beta_{0j} = \gamma_{00} + \gamma_{01} \text{Accountability} + \sum_{m=2}^M \gamma_{0m} X_{mj} + u_{0j}$$

$$\beta_{kj} = \gamma_{k0} ,$$

where Y_{ij} is the wellbeing outcome of student i in school j ; β_{kj} are coefficients for student-level covariates (X_{kij}) such as female, SES index, and standardized test scores for reading, math and science; and e_{ij} is a student-level random effect. For the school-level coefficients, γ_{00} is the intercept, γ_{01} is the main coefficient of interest for being in a school that practiced teacher accountability, and the γ_{0m} 's are coefficients for the school-level covariates like school mean SES and being in a public school or urban school. The model includes u_{0j} to account for the between-school random effects. While comprehensive, we recognized concerns about bias in the estimated coefficients, and so we used several analytic strategies to address these.

First, we leveraged the data and design as much as possible by adding theoretically-motivated controls that may affect the relationship between test-based accountability and student wellbeing. While accountability was not systematically associated with any of the control variables, some of these variables independently affected a number of wellbeing variables, and thus, we added these as covariates.

Second, we employed theoretical and empirical robustness checks. As a theoretical robustness check, we tested the association between accountability and wellbeing dimensions other than personal efficacy. Since accountability may induce pressures to perform, we hypothesize that this policy should only influence the personal efficacy dimension of student

wellbeing but not necessarily be associated with the more general dimensions of wellbeing like life satisfaction and social belonging. As an empirical robustness check, we also disaggregated the results along different school classifications. Since the strength and direction of the estimates may vary across heterogeneous populations, we provided estimates for higher and lower SES schools (bisected along the median, and divided into the highest and lowest quartiles), public and private schools, and urban and non-urban schools. While serving as robustness check, this investigation into heterogeneities also answers the question of contexts where accountability was predictive.⁴

Lastly, concerns about omitted variables may still be present even after these battery of controls, and theoretical and empirical robustness checks. Thus, we also quantified how much bias there would have to be due to omitted variables in order to invalidate the inferences we made (Frank et al. 2013). This method presents how many observations would have to be changed to zero effect in order to counter the inferences we made.

The data are available from the PISA OECD website and the code for the analysis is available at <DOI redacted for anonymity>.

Results

Descriptive statistics for the variables on student wellbeing, school type, demographics, and academic achievement are presented in Table 2. We compare the full sample with the analytic sample and show that despite the reduction of the sample to 147 schools, the variables in the analytic sample did not have statistically significant differences with the full sample. In the analytic sample, the student wellbeing measures had a mean of zero and a standard deviation of one, similar to the full sample. School composition is similar with 93% identified as public schools and 40% situated in urban school areas. Demographic details and standardized test scores are also available.

<INSERT TABLE 2 NEAR HERE>

Accountability and personal efficacy

Table 3 presents the association between teacher accountability and different dimensions of wellbeing. In the first to third columns, we investigated how teacher accountability predicted three dimensions of personal efficacy, hypothesizing that the school practice of accountability was negatively linked with these wellbeing dimensions.

<INSERT TABLE 3 NEAR HERE>

After controlling for student background, academic achievement and school type, we found that teacher accountability was negatively associated with task motivation and resilience, and positively associated with fear failure, all statistically significant at $p < 0.01$. Substantively, we find that being in a school with test-based teacher accountability was associated with a reduction in students' task motivation and resilience by a tenth of a standard deviation, and an increase in fear of failure by the same magnitude. To put this in perspective, the median effect size for education studies with samples larger than 2,000 students is 0.03, and effects for charter schools are often below a tenth of a standard deviation (Betts and Tang 2018; Kraft 2020). This suggests that the association is not only statistically significant but also substantively meaningful.

Taken together, these results suggest that compared to students in schools where test scores are not used to evaluate teachers, those students in schools with such accountability practice, on average, (1) showed lower motivation to perform or improve in tasks, (2) perceived themselves to be less able to accomplish tasks or handle difficulties, and (3) experienced greater fear and anxiety of failing. Such associations are robust and substantively meaningful, even after considering students' academic performance and social background.

Accountability, life satisfaction, and social wellbeing

While test-based accountability may be negatively associated with their motivation to perform, could it also be associated with dimensions of satisfaction and social wellbeing? To answer this, Table 3 includes tests of association between accountability and the *satisfaction* and *social* dimensions of wellbeing. Controlling for the same covariates, the practice of accountability in schools was neither associated with having positive feelings nor was it associated with greater or less life satisfaction. The point estimates also show miniscule effect sizes of one percent of a standard deviation. Similarly, being in a school that had test-based accountability was not associated with students' sense of belonging or perception of competition. These results suggest that students' sense of life satisfaction and social wellbeing were unaffected by their being in a school with test-based teacher accountability practices instituted.

Heterogeneity of associations

The previous results suggest that test-based teacher accountability was negatively associated with student's personal efficacy and motivation, but not with other dimensions like satisfaction and social wellbeing. The inclusion and the significant estimates of the three indices under the personal efficacy dimension provide one source of confirmation that the associations were not spurious. Moreover, the comparison with the other dimensions of wellbeing provides evidence that accountability only predicted personal efficacy, without spilling over to other wellbeing dimensions such as life satisfaction, positive affect, or social belonging. However, the strength and direction of the association between teacher accountability and self-efficacy may differ according to heterogeneous populations.

<INSERT TABLE 4 NEAR HERE>

Thus, Table 4 provides estimates from models that disaggregated the sample by different school classifications. Since students in more economically disadvantaged schools may show lower task motivation (Destin et al. 2019), we first bisected the sample of schools between those above and below the school SES median. Despite this division, however, accountability was still linked with lower levels of task motivation and resilience, and higher levels of fear of failure for both groups. It had similar substantive estimates of reduction or increase by around a tenth of a standard deviation. Panel A of Table 4 presents these significant coefficients, except for the coefficient for fear of failure in higher SES schools.

However, when we investigated patterns for the highest and lowest quartiles of school-level SES, we found that the coefficients for personal efficacy were only significant for students in the bottom quartile schools. Panel B of Table 4 shows that accountability was associated with a reduction in student resilience by 17 percent of a standard deviation, and an increase in fear of failure by 14 percent of a standard deviation, both significant at $p < 0.05$. This suggests reduced efficacy dimensions for students in accountability-induced low-income schools.

Another potential source of heterogeneity was in terms of the difference between public and private schools, with the potential of greater disadvantage in public institutions (Benveniste, Carnoy, and Rothstein 2013; Coleman, Hoffer, and Kilgore 1982). Panel C shows that in public schools, students in accountability-induced schools had reduced task motivation and resilience, and increased fear of failure as compared to students in schools that did not have this practice. The estimates were by a tenth of a standard deviation. These associations, however, were not statistically or substantively significant for private schools. While some may assume that most public schools use test-based teacher accountability, our sample showed greater variability as only

39.71% of public schools practiced this form of accountability. Thus, the significant associations for public schools remain robust. However, we are circumspect with interpreting the lack of statistically significant association among private schools because of the small sample of schools (10 schools) and students within them (202 students).

Finally, urban and non-urban schools in the United States have critically different characteristics and outcomes, with urban schools and districts more racially and economically segregated (Frankenberg 2009; Trinidad 2020), leading us to test the estimates between these two subgroups. Panel D of Table 4 highlights that the practice of accountability in urban schools was significantly associated with lower task motivation and resilience, and higher levels of fear of failure. In particular, it was associated with decreases of 15 percent of a standard deviation in terms of task motivation and resilience, and an increase of 13 percent of a standard deviation in terms of fear of failure. However, such associations were absent for non-urban schools. While questions may arise regarding the possible distributional difference in accountability practices between urban and non-urban settings, we find that 40% of both urban and non-urban schools had this form of accountability practice instituted.

Recognizing concerns about potential omitted variables invalidating our estimates, and adding to the battery of robustness checks that we have already instituted, we drew on the work of Frank et al. (2013) and quantified how much bias there would have to be to invalidate our inference. Using this analysis, we found that for the personal efficacy dimension, 34.65% of the estimate would have to be due to bias to conservatively invalidate our inference. Substantively, this means that more than 1,500 observations would have to be replaced with cases of zero effect, to invalidate our inferences.

Discussion

Studies on quantification and data in organizations have often focused on the way these measures influence individual behaviors as well as organizational processes and priorities (Mennicken and Espeland 2019). Often, public organizations institute accountability measures to drive better performance and behavior among its staff, hold leaders responsible for organizational efficiency, and legitimize the public enterprise (Arthur 2017; Bovens et al. 2014; Wilson 2011). However, studies have also shown how the focus on performance and the pressure to attain certain metrics have led to gaming strategies and outright cheating (Figlio and Getzler 2006; Hibel and Penn 2020; Neal and Schanzenbach 2010). While many studies focus on the impact of organizational metrics and quantification on people's behavior, much less is known about how such a performance-inducing practice as accountability can influence wellbeing. Using the case of schools in the United States, we find that accountability practice was associated with reduced motivation to perform and increased fear of failure, and that the associations were salient in contexts of relative disadvantage: low-income, public, and urban schools. We suggest three key insights that have implications for the study of quantification in organizations in general, and the study of accountability practices in schools in particular.

First, policies that put a focus on and are oriented towards performance may create environments harmful to one's sense of personal efficacy. Here we highlight the irony of accountability, where a policy that was supposed to encourage better performance might unintentionally reduce people's motivation to perform. Noting the difference between actual performance and motivation to perform, we suggest that accountability policies may improve the *performance* of different tasks, such that in schools, teachers are putting more effort on instruction and students are getting higher scores in standardized examinations (Figlio and Loeb 2011; Rouse

et al. 2013). But such improved performance may come at the expense of the *social climate*, which could then put a strain on certain dimensions of people's wellbeing (Mitchell et al. 2018). In the case of US high schools, we find that the practice of using tests for accountability was associated with lower levels of task motivation and resilience, and higher levels of fear of failure, suggesting that the focus on quantifying performance may significantly influence individuals' feelings of self-efficacy.

While past studies on quantification and accountability have mainly focused on observable individual and organizational performance (see Mennicken and Espeland 2019 for a review), we suggest that attention be given as well to dimensions like wellbeing. In organizational studies, the emphasis has been on how pressures can lead to changed behaviors such as focusing resources on measurable outcomes, improving work efficiency, or making decisions based on data (Espeland and Sauder 2016; Marshall et al. 2015; Nielsen and Riiskjær 2013). In schools in particular, studies have focused on how the presence of accountability are beneficial for short- and long-term student outcomes (Chiang 2009; Deming et al. 2016; Figlio and Loeb 2011). The present research suggests that measures of accountability are not just linked to observable performance; they are also related to internal motivation to perform. While performance may be positively affected by a focus on accountability through increased efficiency and clearer responsibility, *wellbeing* and *human development* may be sacrificed byproducts of this quantified logic.

Second, while research suggests that the focus on quantification may influence greater work pressure and reduced morale, our research suggests that not all facets of wellbeing are affected by this focus. In particular, we find that the associations were mainly in terms of the self-efficacy dimension of wellbeing and not necessarily on the life satisfaction and social dimensions. While previous qualitative studies have been more domain-general in their assessment of

quantification and wellbeing, suggesting wholesale psychological harm of performance pressures (Gurova and Piattoeva 2018; Mitchell et al. 2018), our quantitative study highlights the need to be more specific on which domains of wellbeing are linked to these pressures. We highlight how pressures affect wellbeing dimensions that directly relate with performance and do not necessarily spillover to other dimensions of one's personal wellbeing.

This insight offers two related contributions to the study of quantification in organizations. On the one hand, it provides an impetus to examine the *specific* types of psychological outcomes related to performance pressures, quantification processes, and accountability measures. It offers a stimulus to investigate not only broad concepts of stress and fatigue but also finer grained ones of motivation, satisfaction, and social belonging. On the other hand, the study also presents what may be among the first studies to empirically analyze with a national sample how accountability influences wellbeing. In line with this, we suggest the potential in studying how different types of performance management measures may affect various dimensions of people's wellbeing across different sectors and industries. While quantification of performance has become a widespread phenomenon (Mennicken and Espeland 2019), variations in the manner of quantification may also variably impact different dimensions of people's wellbeing.

Third, the influence of quantification does not operate similarly across organizational types and systems. We find that the associations were particularly salient in contexts of relative disadvantage: Among schools in the lowest SES quartile, students placed in an accountability-induced school were more likely to have reduced task motivation and resilience, and increased fear of failure than students in a school that did not institute this accountability practice—net of their academic performance and sociodemographic background. The same is true for students in public school and urban settings, suggesting that the context matters for how quantification may influence

wellbeing. One potential way of explaining the differential trends is with how these disadvantaged contexts are further disadvantaged by measures and mechanisms of control as they narrowly focus on compliance of policy demands (Diamond and Spillane 2004).

More generally, this highlights how the salience of quantification and performance metric pressures may operate differently in different contexts. In particular, the harms of accountability and quantification may be more visible in contexts of disadvantage, and in environments where the metricalization of performance were previously absent (Hallett 2010; Stevenson 2017). For example, the presence of accountability systems may highlight and exacerbate the already failing system in an organization, such that this reduces morale of its actors (von der Embse et al. 2016). Similarly, organizations that did not previously have such system of evaluation and surveillance may meet resistance from actors that have been used to the status quo (Hallett 2010). Thus, accountability and quantification per se may not immediately be associated with lower motivation since historical and institutional contexts matter significantly for such association to be discernible. Taken together, these concepts suggest the potential harms of accountability in terms of self-efficacy and motivation, made more salient by the context of disadvantage, but not necessarily consequential for other dimensions of wellbeing.

Implications for intersecting organization studies and social psychology

While research on organizations have often focused on individual behaviors and organizational structures, this research suggests the potential for interrogating the intersection of organizations and human development. Concepts such as individual identity, wellbeing, motivation, risks, and vulnerabilities need to be understood within more classical theorizations of organizations because of how these internal personal factors are recognized as antecedents of organizational performance

(Schieman et al. 2009; Shuck et al. 2011). While policies and processes such as quantification and accountability are consequential for organizational behaviors, relations and structures, a more comprehensive theorization needs to also attend to the often implicit and invisible aspects of people's dispositions and motivations. While organizational actors may act efficiently and rationally, they may also resist or experience stress when policies have counter-productive consequences for their motivation.

Our study highlights the need for research in other fields and firms to interrogate this critical intersection of organizations and human flourishing—an important nexus for sociological research. We argue that it is critical for sociologists to study this because of how marginal organizational improvements can come at the expense of individual human wellbeing. Such collateral consequence may also be consequential for social and racial inequities when quantified logics are more often directed to, and more negatively impact, jobs and organizations for racial minorities and working-class individuals (Thoits 2010). Thus, our research re-emphasizes the need for studies that look at social psychological effects in organizations, and how such can contribute to social reproduction and inequality.

Implications for education policy and inequality

Historically, accountability policies sprang from efforts to deal with racial inequality and the poor performance in urban schools. In a way, it was originally intended to address social reproduction and stratification. However, decades of social scientific research have also shown the unintended consequences of well-intentioned organizational policies and the use of performance indicators. In this research, we show that facets of these high-stakes performance measures may contribute to unproductive pressure and demotivation among school staff and students. For example, the nature

of these exams being used for teacher evaluation, incentives, and sanctions can create fear or resistance to testing regimes (Lingard 2021).

Given these findings, we argue for studies that investigate better forms of quantification, greater variety of performance indicators, and more supportive systems of accountability. While it has not been the purview of this research to explore *what* these alternatives are, we show aspects that policy makers need to be attentive of. First, they must be sensitive not only to observable improvements in test score outcomes but also to people's lived experiences and wellbeing since Campbell's (1979) law may manifest in improved indicators but sacrificed social climates. Second, these policies have to interrogate how inequities may be exacerbated because of schools more negatively affected by quantified logics. Third, they should provide more holistic indicators that are able to inform instruction and practice, and not simply rely on once-a-year examinations. By attending to these facets and potential pitfalls, policies that use quantitative social indicators may increase its potential for effectiveness and equity.

Limitations

While the study has important contributions and implications for the study of organizations, quantification, and education, we acknowledge certain limitations as well. First, the study is an exploratory study into how a particular form of quantification is associated with wellbeing. It provides a suggestion or stimulus for investigation rather than a confirmation of a theory. In a way, it seeks to start contributing to a theory for how organizational forms and processes may influence internal personal dispositions.

Second, the study is limited to a particular form and context of quantification, i.e., test-based teacher accountability in US education. While the case is unique and other organizations

have little overlap with school processes, the suggested idea of the irony of accountability may be discernible in other forms such as organizational surveillance that lower actors' morale, trust, and efficacy (Sewell and Barker 2006; Sewell, Mol, and Taskin 2019). Thus, the study encourages exploration into how the form of organizational quantification may be linked to aspects of wellbeing and human development.

Third, a number of methodological limitations has to be noted, including the use of cross-sectional data, elimination of observations with no school-level variables, and potential bias from unobserved confounding. Since the PISA has a repeated cross-sectional design, we cannot follow students' trajectories and thus, we are limited by the associational patterns discerned in the dataset. We were also limited to using a dichotomous measure for accountability, which may make our estimates more conservative since we did not account for the extent of such practice but only if schools had that practice. While PISA had a nationally representative US sample, our analytic sample was not representative because of our exclusion of observations without any school-level variable. Although concerns may arise for this necessary exclusion, we did not find any statistically significant difference between the full and analytic samples, providing some assurance that the non-inclusion of some schools had little deleterious consequences. Other factors also impact the presence of accountability and students' wellbeing like neighborhood contexts, race, alternative schools, and district policies. These variables, however, were absent in the PISA survey, and so the study only relied on controlling academic achievement and demographics.

Finally, the experience of being in environments pressured by accountability and quantified logics is best understood through qualitative studies. The present research hopes to encourage further research into the processes within organizations that affect people's motivation and morale, as well as attend to heterogeneities within organizational actors' responses to quantification. While

the present study suggests the harms (and irony) of accountability, grounded studies may find out why, how, and for whom this happens.

Conclusion

Systems and regimes of quantification permeate organizations through accountability practices, program evaluations, periodic monitoring, and other forms of impact measurement. Many studies focus on the way these processes change organizational strategies and structures, individual behaviors and actions, and social relationships and consciousness. Our study attempts to show how quantification may likewise influence internal personal processes—often invisible and sometimes in opposition to what is actually observed. More specifically, we suggest the irony of accountability, understood as how a policy that was supposed to induce performance may inadvertently reduce organizational actors' motivation to perform. Using the case of test-based teacher accountability in the United States, we find how this practice in a school was linked with reduced task motivation and resilience, and heightened fear of failure—apparent in low-income, public, and urban schools. While the case is specific to the educational institution, potential processes may be discernible for organizations where data have high stakes. We thus suggest the irony with how the process of quantification may lead to better observable behaviors and outcomes but may come at the expense of people's motivation and self-efficacy.

NOTES:

¹ The use of test-based accountability in the United States is widespread, and more frequently, standardized test scores are used to provide incentives and sanctions to schools. While the negative impact of this practice is documented, we focus our analysis on test-based *teacher* accountability systems because of how this practice may create heightened pressures not only for the school organization but for individuals within the organization. Additionally, investigating teacher accountability provides greater analytic variation since not all schools institute this practice but many U.S. schools practice some form of school-based accountability.

² In the results section, we provide descriptive statistical comparisons between the full U.S. sample and analytic subsample, and show that no statistically significant differences were present between the two in terms of the key variables being investigated.

³ While the WLE estimates were computed for the OECD subsample, we opted to standardize this measure for the entire U.S. subsample to create more interpretable estimates. It must be noted, however, that our tests show little differences in estimates when using either the OECD or the U.S. WLE estimates. Results of the regressions with the OECD WLE estimates are available upon request.

⁴ Our investigation was not concerned about where the association between wellbeing and accountability was most significant since we were more concerned about *whether* the association remained significant in disadvantaged contexts. This explains our disaggregating the sample and not using interaction or moderation analysis.

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Table 1: Dimensions of Student Wellbeing

	Description	Example item/s
<i>Personal Efficacy Dimension</i>		
Task motivation	measures how much the student finds satisfaction in working as hard as they can and in improving their performance.	"I find satisfaction in working as hard as I can"; "Part of the enjoyment I get from doing things is when I improve on my past performance"
Resilience	reflects the student's perception of efficacy and ability to accomplish things, handle difficulties, and get through hard times.	"I usually manage one way or another"; "When I'm in a difficult situation, I can usually find my way out of it"
Fear of failure	indicates the student's insecurity, doubt, or lack of confidence in their ability and talent.	"When I am failing, I worry about what others think of me"; "When I am failing, I am afraid that I might not have enough talent"
<i>Satisfaction Dimension</i>		
Positive affect	reflects the student's general emotional disposition and frequency of feeling positive emotions.	Frequency of feeling: happy, joyful, and cheerful (never, rarely, sometimes, always)
Life satisfaction	measures the student's overall evaluation of their life.	"On a scale of 1-10, how satisfied are you with life these days?" (subsequently standardized)
<i>Social Dimension</i>		
Belonging	indexes the student's sense of belonging, integration, and connectedness with people in school.	"I make friends easily at school"; "I feel like I belong at school"
Perception of competition	indicates the student's belief of the level and environment of competitiveness in a school.	"Students seem to value competition"; "It seems that students are competing with each other"

Note: All indices are standardized and composite measures, composed of Likert scale type questions with item examples on the last column. Only life satisfaction was not a composite variable since it only includes one question that has been subsequently standardized for this research.

Table 2: Summary Statistics

	Full Sample			Analytic Sample		
	Mean	Standard deviation	Non-missing Count	Mean	Standard deviation	Non-missing Count
<i>Student wellbeing measures(a)</i>						
Task motivation	0.00	1.00	4,596	0.00	0.98	4,161
Resilience	0.01	0.99	4,623	-0.01	0.99	4,185
Fear of failure	0.02	0.99	4,626	0.02	0.99	4,190
Positive affect	-0.01	1.00	4,594	0.00	0.99	4,160
Life satisfaction	-0.01	1.00	4,651	-0.01	1.00	4,212
Belonging	0.01	1.00	4,619	0.01	1.00	4,182
Perception of competition	0.01	1.00	4,548	0.01	1.00	4,124
<i>School-level variables</i>						
Accountability	0.41		147	0.41		147
Public school	0.93		148	0.93		144
Private school	0.07		148	0.07		144
Urban school	0.41		149	0.40		145
Non-urban school	0.59		149	0.60		145
<i>Individual-level variables</i>						
Female	0.49		4,838	0.49		4,371
SES Index	0.11	1.02	4,767	0.14	1.01	4,307
Math test score	477.92	91.99	4,838	479.88	91.38	4,371
Reading test score	505.00	108.27	4,838	507.36	107.06	4,371
Science test score	501.84	98.04	4,838	503.62	97.28	4,371

Source: Programme for International Student Assessment 2018 (United States)

Note: The measures represent the mean, standard deviation, the percent belonging to a specific gender or school category, and the number of non-missing observations. The analytic sample is limited to schools that have information regarding their practice of accountability. From the table, we show that there were no statistically significant differences on the key variables between the full and analytic samples.

Table 3. Estimates of Hierarchical Linear Models of Teacher Accountability on Student Wellbeing

	Personal Efficacy Dimension			Satisfaction Dimension		Social Dimension	
	Task Motivation	Resilience	Fear of Failure	Positive affect	Life satisfaction	Belonging	Competition
<i>Key variable</i>							
School Accountability	-0.09** (0.03)	-0.10** (0.04)	0.10** (0.04)	-0.01 (0.03)	0.01 (0.04)	0.01 (0.03)	0.03 (0.03)
<i>Covariates at the student level</i>							
Female	0.15*** (0.03)	0.02 (0.03)	0.38*** (0.03)	0.02 (0.03)	-0.18*** (0.03)	-0.12*** (0.03)	0.03 (0.03)
SES Index	0.08*** (0.17)	0.11*** (0.02)	0.03 (0.02)	0.12*** (0.02)	0.15*** (0.02)	0.12*** (0.02)	0.12*** (0.02)
<i>Covariates at the school level</i>							
Public School	-0.18* (0.08)	0.08 (0.09)	0.04 (0.08)	-0.16 (0.08)	-0.15 (0.09)	-0.32*** (0.08)	0.04 (0.08)
Urban School	-0.05 (0.03)	-0.02 (0.04)	0.00 (0.04)	-0.02 (0.03)	-0.10** (0.04)	-0.02 (0.03)	-0.19*** (0.04)
School Mean SES Index	-0.12** (0.04)	-0.16*** (0.04)	0.17*** (0.04)	-0.08* (0.04)	-0.14** (0.04)	-0.08* (0.08)	-0.01 (0.04)
<i>Intercept</i>	-0.65*** (0.09)	-0.14 (0.09)	1.09*** (0.10)	0.44*** (0.11)	0.68*** (0.12)	-0.52*** (0.11)	0.21* (0.09)
<i>Controls for student achievement</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
% variance explained at Level 1	4.12	2.03	6.15	2.05	2.05	2.03	2.07
% variance explained at Level 2	30.56	15.97	82.27	23.44	26.53	39.51	43.75

Source: Programme for International Student Assessment 2018 (United States), $n = 4,371$ students, 147 schools

Note: The table presents regression coefficients from hierarchical linear models regressing student-reported wellbeing on the presence of test-based teacher accountability system in school, along with individual-level and school-level predictors as controls. In addition, all models control for students' achievement in standardized tests for reading, mathematics, and science. Standard errors are written in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 4. Estimates of Hierarchical Linear Models of School Accountability on Student Wellbeing, Disaggregated by School Classification

	Personal Efficacy Dimension			Satisfaction Dimension		Social Dimension	
	Task Motivation	Resilience	Fear of Failure	Positive affect	Life satisfaction	Belonging	Competition
<i>A. School Disadvantage Median</i>							
Higher SES Schools (<i>n</i> =73)	-0.10* (0.05)	-0.10* (0.05)	0.07 (0.05)	-0.04 (0.04)	0.05 (0.05)	-0.00 (0.04)	-0.01 (0.05)
Lower SES Schools (<i>n</i> =74)	-0.10* (0.05)	-0.11* (0.05)	0.11* (0.05)	0.02 (0.05)	-0.05 (0.05)	0.02 (0.04)	-0.01 (0.04)
<i>B. School Disadvantage Quartile</i>							
Top SES Quartile (<i>n</i> =37)	-0.13 (0.07)	-0.14 (0.08)	0.07 (0.06)	0.04 (0.06)	0.01 (0.07)	-0.07 (0.06)	0.02 (0.06)
Bottom SES Quartile (<i>n</i> =37)	-0.13 (0.07)	-0.17* (0.07)	0.14* (0.07)	-0.01 (0.07)	-0.09 (0.06)	0.01 (0.07)	-0.09 (0.07)
<i>C. School Type</i>							
Public Schools (<i>n</i> =137)	-0.11** (0.03)	-0.10** (0.04)	0.10** (0.03)	-0.01 (0.03)	-0.01 (0.04)	0.01 (0.03)	-0.01 (0.03)
Private Schools (<i>n</i> =10)	0.13 (0.17)	0.00 (0.28)	-0.02 (0.17)	0.03 (0.16)	0.35 (0.28)	0.05 (0.22)	-0.51* (0.22)
<i>D. Urban Context</i>							
Urban Schools (<i>n</i> =58)	-0.15** (0.05)	-0.16** (0.06)	0.13* (0.05)	-0.05 (0.06)	0.03 (0.06)	0.03 (0.04)	0.03 (0.06)
Non-urban Schools (<i>n</i> =89)	-0.07 (0.04)	-0.06 (0.04)	0.07 (0.05)	0.01 (0.04)	-0.02 (0.05)	0.00 (0.04)	-0.05 (0.04)

Source: Programme for International Student Assessment 2018 (United States), *n* = 4,371 students, 147 schools

Note: The table presents regression coefficients from hierarchical linear models regressing student-reported wellbeing on the presence of test-based teacher accountability system in school, inclusive of the same student- and school-level covariates in Table 3. Panels A to D disaggregate the sample by school disadvantage, school type, and urban context. In Panel A, the schools were divided along the median school-level socioeconomic status (SES) index while in Panel B, we limited it to the top and bottom quartile schools according to school-level SES. Standard errors are written in parentheses. * $p < .05$, ** $p < .01$, *** $p < .001$