The Effect of Universal Free Meals on Student Perceptions of School Climate: Evidence from New York City

Emily Gutierrez
Urban Institute

Over the last decade, more and more schools have adopted Universal Free Meals (UFM), a program that provides meals free of charge to all students, regardless of household income. Recent research finds UFM increases participation in school meals, improves test scores, and reduces incidences of bad behavior. Additionally, advocates cite stigma reduction as one of UFM's many benefits, but to date, scholars have yet to provide empirical evidence of this claim. This paper fills the gap in the literature by being the first to examine whether UFM influences student perceptions of school climate. I use individual, student survey responses and school meal participation data from New York City Department of Education (NYCDOE) to investigate whether and to what extent UFM changes participation behavior and student perceptions of their school climate. Using a difference-in-differences design, I exploit students' staggered exposure to UFM, among those that are ever exposed, to investigate if UFM influences participation and improves student perceptions of bullying, fighting, respect, and safety. I find UFM increases school lunch participation among students that were previously eligible for free meals but rarely participated, suggesting that UFM affects participation patterns beyond simply reducing the price of food. All students, regardless of socioeconomic status, report reductions in perceptions of bullying and fighting within school, as well as improvements in perceptions of safety outside of school. Notably, students ever designated as eligible for free/reduced price meals and those that ate school lunches last year report feeling safer inside the school cafeteria. Thus, not only does UFM improve perceptions associated with stigma for students who directly interact with UFM, but the program also has positive effects for all students regardless of their socioeconomic status.

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Acknowledgements

I.   Introduction

In a 2014 report, the United States Department of Agriculture (USDA) found almost half of districts nationwide had some form of "shaming policy," in which students with unpaid meal debts are publicly acknowledged in front of their peers (USDA, 2014). These actions, in addition to the traditional way in which students pay for school meals, may provide opportunities for students to bully one another. As of 2019 at least 5,000 districts across the United States provide free meals to all students, regardless of household income, under Universal Free Meals (UFM). Because it removes both differential pricing *and* opportunities to shame students, it is likely that UFM affects how students perceive their school climate.

Over 500 schools in New York City (NYC) adopted UFM between 2010 and 2017, while numerous others had already implemented the free meal program prior to 2010. Furthermore, NYC is highly motivated to understand and evaluate school climate, and therefore has administered annual school environment surveys to 6th-12th grade students since 2010. Exploiting the variation in timing of adoption of UFM, as well as rich administrative data and student responses to surveys, I examine whether the UFM expansion in NYC increased meal participation and improved student perceptions of school climate.

School climate describes the quality and character of school life and includes students' norms, beliefs, relationships, and learning practices, and students' perceptions of their learning environment can heavily influence their social and emotional well-being, as well as academic success (Freiberg, 2005; Cohen, McCabe, Michelli, & Pickeral, 2009; Wang et. al., 2014; Davis & Warner, 2018; Arseneault, Walsh, Trzesniewski et al., 2006; Juvonen, Wang, & Espinoza, 2011; Lacoe 2016). Schools often administer school environment surveys to gain insight into

how students perceive school climate and include questions pertaining to academic climate, student relationships with their peers and teachers, and the institutional environment itself.

In a positive school climate, students feel socially, emotionally, and physically safe (Cohen, McCabe, Michelli, & Pickeral, 2009). A safe environment is necessary for student learning, and inter-group and inter-personal relationships are essential for social and emotional well-being (Maslow, 1970; Cohen, McCabe, Michelli, & Pickeral, 2009; Wang et. al., 2014). However, a negative school climate, in which students feel uncertain about what the day at school will hold, can have detrimental effects on student behavior and academic outcomes. Students preoccupied with their own safety or bullying may be less willing to go to school and less likely to allocate the necessary higher-order thinking skills to the day's lessons, resulting in poor academic outcomes. Prior research finds associations between school climate and academic achievement. More specifically, scholars find bullying affects student feelings of safety, which in turn affects their academic achievement. (Davis & Warner, 2018; Arseneault, Walsh, Trzesniewski et al., 2006; Juvonen, Wang, & Espinoza, 2011; Lacoe 2016).

School cafeterias are particularly salient in shaping school climate as they offer students a daily opportunity to interact with less supervision than what is experienced in a classroom setting. In fact, scholars regularly gain insight into intergroup relations between students of different socioeconomic statuses, abilities, and races by observing student behavior in cafeterias (Carter et. al., 2005; Echols, Solomon, & Graham, 2014). Lunch time for students may be spent a number of ways, including sitting with friends or worrying about with whom to sit. It also provides students the opportunity to eat school lunch, the price of which depends on each student's family income. Given that students with lower household incomes receive meals at a free or reduced price – and that a nontrivial share of schools implement shaming techniques for

students with unpaid meal debts – lunch time affords students the opportunity to observe and identify each other as "poor."

UFM removes the visible signals of socioeconomic status by making all meals free for all students. Therefore, one might expect UFM to improve perceptions for those who potentially experience feelings of stigma associated with school food. However, it is possible that UFM improves perceptions for all students. For example, advocates claim the implementation of school uniform policies negate the everyday distraction of "wearing the right thing," particularly for low-income students, by creating an environment in which students' familial resources are not as easily identifiable through students' clothing. However, scholars find more far-reaching effects: school uniforms improve the school environment (i.e., students felt safer and reported less bullying) among *all* students (Murray, 1997; Brookshire, 2016). Similarly, while some may believe UFM is targeted toward providing stigma relief among "poor" students, UFM could improve perceptions of school climate for *all* students, regardless of poverty status or participation behavior.

Over the last decade, an increasing number of schools and districts across the US have adopted UFM. Recent research finds UFM increases participation in school meals, raises test scores, reduces incidences of bad behavior, and may have positive effects on student weight outcomes (Altindag, Baek, Lee, & Merkle, 2018; Gordon & Ruffini, 2018; Schwartz & Rothbart, 2019). Additionally, advocates cite stigma reduction as one of UFM's many benefits, but to date, scholars have yet to provide empirical evidence of this claim.

This paper fills the gap in the literature by being the first to examine whether UFM influences student perceptions of school climate. I use rich/detailed student-level data on meal participation and survey responses for NYC students in grades 6-12 from 2013-2017 to examine

whether and to what extent UFM changes student meal participation behavior and perceptions of school climate. The survey covers a range of topics, including whether students observe bullying and feel safe, and response rates range from 80-90 percent of all 6th-12th grade students each year. Survey data is combined with administrative records from the NYC Department of Education (NYCDOE), which includes demographics, certification status for free/reduced-price meals, and the UFM status of the school each student attends. NYC schools adopt UFM at different times across 2013-2017. Therefore, I use a difference-in-differences design and student fixed effects to exploit students' staggered exposure to UFM among those that are ever exposed.

I find UFM increases lunch participation, specifically for students who have ever had to pay for school meals. In addition, UFM improves perceptions of bullying, fighting, and safety for all students, regardless of poverty or participation status. Notably, students that participated in the prior year or have ever certified eligible report feeling safer in less supervised areas of the school, including the cafeteria. An increase in participation is expected when food becomes free for students who, in the absence of UFM, would pay. However, I find UFM induces participation even among students for whom meals were previously free. This suggests that factors beyond price change – perhaps including stigma – influence students' decision to participate.

II.   Background & Theory

Background on UFM

The National School Lunch Program (NSLP) and School Breakfast Program (SBP) are federally funded programs that provide subsidized meals to students in over 100,000 public and private schools and childcare centers. All students may participate in school food, however, the *price* each student pays is determined by each student's household income. NSLP and SBP

provide free meals to students with household incomes up to 130 percent of the federal poverty line, reduced-price meals to students with household incomes up to 185 percent, and full price meals for all other students. Students are certified as eligible for free/reduced-price meals in one of two ways: 1) returning completed applications indicating the student's household income or 2) through direct certification, in which schools match students to a state-provided database of Supplemental Nutrition Assistance Program (SNAP)/Temporary Assistance for Needy Families (TANF)/Medicaid participants.

SBP and NSLP improve the nutrition of participating students, particularly among disadvantaged students (Bhattacharya, Currie, & Haider, 2006; Gunderson, Kreider, & Pepper, 2012; Smith 2017). However, student participation rates are regarded as low, even among free-lunch certified students. This suggests participation behavior depends on something other than price barriers. There are likely several factors beyond price that influence a student's decision to participate in school food, including school food menus, availability of competing foods in the cafeteria, general attitudes toward school food, and the potential stigma that comes from choosing food associated with "poor kids" (Toosi & Schwartz, 2019; Bhatia, Jones, & Reicker, 2011). Moreover, these attitudes can influence whether students eligible for free/reduce-priced meals turn in applications to be formally certified, and may help explain why, in some contexts, over 10 percent of income eligible students are not certified for free/reduce-priced meals (Domina et. al., 2017).

Student participation in school food, whether by certifying eligible for free/reduced-price meals or simply eating the meals provided, can signal information about familial resources to a student's peers (Stein, 2008). Students demonstrate their agency by choosing whether to participate and make these choices partly based on their perceptions of belonging (Roper & La

Niece, 2009). Moreover, student attitudes toward school food, the idea that it is for "poor kids," and the associated treatment of identified students may affect how participating students feel at school. Therefore, to avoid the stigma of being associated with free food, students may choose to not participate (Bhatia, Jones, & Reicker, 2011; Pogash, 2008).

Furthermore, students may avoid participating in school food to escape their school's consequences for not being able to pay. Some schools force students with unpaid meal debts to throw away their originally provided hot meal and replacing it with a cold sandwich, while others require students to "work off their debts" by cleaning the cafeteria (Reynolds, 2019; Siegel, 2017). Other schools have even sent letters home threatening parents with child protective services for sending their child to school without lunch money (Vera, 2019). While the consequences of these policies can be visible to all students, students directly affected by these policies are those in the position to accrue school food debts (i.e., reduced- and full-price students). Students who are consistently certified for free meals are immune to accruing school meal debt and are therefore immune to the shaming associated with these policies.

Any disincentives to participate among already food-insecure students could have lasting effects on participation behavior. These students may miss out on the benefits associated with school food and full stomachs (Bhattacharya, Currie, & Haider, 2006; Gunderson, Kreider, & Pepper, 2012; Schwartz & Rothbart, 2019). Hunger can make it difficult to concentrate and even potentially increase the likelihood students exhibit aggressive behavior. (Jyoti, Frongillo, & Jones, 2005; Kleinman, R. E. et al, 1998). In an effort to reduce administrative costs and burdens, as well as increase participation in school meals, schools in recent years have adopted more inclusive school meal policies and programs, such as Breakfast in the Classroom (BIC) and

UFM.[1] Schools and school districts can provide UFM for all students, regardless of household income, through federal regulations such as Provision 2 and the Community Eligibility Provision (CEP), among others.[2] These provisions federally reimburse schools or districts depending on certified free/reduced-price meal eligibility rates, thereby decreasing the administrative burden of keeping up with student debts. In addition to simplifying administrative complexities, advocates believe these programs increase participation and decrease the stigma students associate with school-meal program participation (Bhatia, Jones, & Reicker, 2011; Pogash, 2008; Stein, 2008).

Prior research finds UFM increases lunch participation and improves academic and weight outcomes, with few consequences for district finances (Kitchen et al., 2017; Leos-Urbel et. al., 2013; Schwartz & Rothbart, 2019; Rothbart, Schwartz, & Gutierrez, 2020; Davis & Mussadiq, 2018). Moreover, Schwartz and Rothbart (2019) examine potential heterogeneous effects of UFM and find UFM increases lunch participation among both full-price and previously certified free/reduced-price students.

In addition to academic and health outcomes, scholars find UFM decreases student behavioral incidences. Gordon and Ruffini (2018) find UFM through CEP reduces suspension rates among elementary and middle school students, and the West Virginia Department of Education school staff reported a decline in behavioral offenses and disciplinary actions post

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[1] BIC provides students with free breakfast in the classroom, as opposed to the cafeteria, after the school day begins.
[2] Since 1980, schools where at least 80 percent of enrolled children are eligible for free or reduce-priced meals can also implement UFM under Provision 1. Since 1995, schools can also offer UFM under Provision 3, which sets reimbursement levels based on the average number of meals served by eligibility group in the most recent year in which the school tracked individual lunch utilization (rather than the average percentages by eligibility group, the method used under Provision 2). Under Provision 3, reimbursements are adjusted for inflation and enrollment, but not for changes in the number of meals served (Schwartz & Rothbart, 2019). Under CEP, a school, cluster of schools, or district can adopt UFM. A school(s) is eligible for CEP if at least 40 percent of the student body is directly certified. There may be a greater incentive to adopt UFM under CEP, as CEP schools and districts are reimbursed at the free lunch rate at 1.6 times the ISP rate. This means schools or districts with direct certification rates greater than or equal to 62.5 percent are reimbursed at the full, "free" federal rate for all meals served.

UFM adoption (Meharie et. at., 2013). Outside of the US, others claim UFM-like programs remove the ability for students to identify others as poor and therefore decrease the incidences of physical fights by 35 percent (Altindag, Baek, Lee, & Merkle, 2018).

The literature often characterizes the mechanism through which UFM affects these outcomes as a decrease in stigma. Exploring the direct effects of UFM on student perceptions of school climate may serve to explain the indirect effects or mechanisms responsible for changes in outcomes already examined in prior research. I contribute to this literature by examining the effect of UFM on student perceptions of school climate, as well as heterogeneous effects of UFM on participation and perceptions by student poverty and participant status. This study uses detailed, student level data to estimate the impact of UFM on 6th-12th grade student participation behavior and perceptions of school climate. Using the longitudinal nature of the panel to identify students' past participation behavior and poverty status, I am able to explore heterogeneous effects for specific students (e.g., those that were eligible for free meals but did not participate in the year prior to UFM exposure). This is the first study to my knowledge that estimates the effects of UFM on student perceptions of school climate using individual meal participation and student responses to school climate surveys.

UFM in NYC

NYC provides a unique environment for studying the effect of UFM on students (Schwartz & Rothbart, 2019). It is the largest school district in the country, serving over 1 million students in 1,800 public schools that are subject to the same rules and regulations. For context, breakfast in NYC has been free for all students since 2004, and students eligible for reduced-price lunch have received free lunch since 2013. The remaining full-price students were

responsible for paying $1.75 per school lunch until 2018 when all meals became free for all students.

Between 2010 and 2017, over 500 NYC schools adopted UFM for the first time. According to the NYCDOE Office of School Food, each school's adoption of UFM is based on a myriad of considerations, including but not limited to political, institutional, and administrative factors. The application process can take up to a year, during which a number of items can delay the process, including increased staff workloads, staff turnover, budget considerations, changes in student composition, etc. Similarly, it is unlikely that students, parents, or staff choose schools based on a school's UFM status. However, it is true that schools that adopt UFM are more likely to serve students with similar characteristics. Therefore, the decision to adopt UFM may be endogenous, but each schools' *timing* of UFM adoption is plausibly exogenous.

Prior research has investigated the effect of UFM on stigma and school experiences from the perspective of school principals. Close to three-fourths of NYC principals that responded to surveys agreed that UFM reduced stigma attached to students who qualify for free or reduce-priced meals, and more than half reported improved dining experiences and social interactions among students in the cafeteria (Peralta, 2016). However, scholars have yet to examine the effect of UFM from the student perspective.

UFM takes place in the cafeteria where students can use food to foster connections, show their agency, and manage relationships in a less supervised setting (Neely, Walton, & Stephens, 2014). Figure 1 shows the two theoretical pathways in which UFM may influence student perceptions of school climate. As noted above, UFM likely increases student participation by making meals free. Based on the law of demand, this price elimination largely affects students that, prior to UFM, had to pay for meals. This increase in participation can affect the way

students interact in the cafeteria (e.g., more students are taking school meals, standing in line together, and eating the same food). Moreover, these interactions are likely spill over to interactions outside of the cafeteria, such as the classroom or outside of school. Both of these changes in interactions can lead to improved school climate perceptions.

UFM may also affect student perceptions of school climate in ways other than through the price of school food. Prior to UFM, students could identify others with unpaid meal debts as those eating a school-provided peanut butter and jelly sandwich instead of the standard hot meal. Post UFM, all participating students can receive a standard meal for free, eliminating physical signals of poverty. UFM may also alleviate student hunger and, therefore, the subsequent aggression among hungry but formerly not participating students. UFM may also change which students are present in the cafeteria. Some schools have "off-campus" lunch and allow students to leave the school grounds during their lunch break. The availability of free meals may induce students that were previously absent from the cafeteria to eat lunch at school, changing the student composition of the cafeteria.

It is difficult to identify and measure each of these factors individually. However, overall changes in these factors can contribute to the school connectedness vital for creating favorable social environments for all students and influence student interactions in the cafeteria and elsewhere (National Research Council, 2002; Rowe & Stewart, 2009). This "whole school" policy that allows students to interact while minimizing visible social barriers may encourage positive relationships within a school community (Rowe & Stewart, 2011). In turn, these interactions likely influence school climate perceptions.

III.   Data

This analysis uses a panel of 6th-12th grade NYC students from 2013-2017 from the NYCDOE and includes individual, daily meal transaction data. The data contains information on over 100,000 unique students, including sociodemographic characteristics such as gender, race/ethnicity, primary language spoken at home, English language learner (ELL) status, free/reduce-priced meal eligibility status, and student with disabilities (SWD) status, as well as individual student responses to the annual NYC School Environment Survey.

NYC School Environment Survey

The NYC School Environment Survey, hereafter called NYC Survey, is administered annually to all students in grades 6-12 and includes approximately 60 questions regarding students' experiences in their school environment. To participate, students must be enrolled in their respective school as of early November. Schools administer the survey during the school day and are instructed to give students a full class period to ensure high response rates. Once completed, schools send the survey responses to the office of NYCDOE. The survey period ends and results are collect by March 31 of each year.

The survey uses a Likert scale format, in which students circle the number that corresponds to their answer.[3] Figure 2 shows the standard instructions provided at the top of each survey and describes the voluntary and confidential nature of the survey, as well as the survey's purpose – emphasizing that it is not a test and there are no wrong answers. Approximately 83 percent of the 6th-12th grade student population respond to the survey each year. The NYCDOE provides an annual report regarding the survey results and publicly provides student response

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[3] Due to the diverse nature of NYC students, surveys are available in Bengali, Chinese, English, French, Haitian, Creole, Korean, Russian, Spanish, and Urdu.

rates by school each year. For example, in 2016, 97.8 percent of NYC schools participated, with an average student completion rate of 82.3 percent.

The NYCDOE collaborates with the Research Alliance for NYC Schools, making minor revisions to the survey each year. General revisions include elimination of items found to be redundant, the addition of items to improve the strength of existing measures, and revision of existing items to improve clarity. Prior research has utilized student responses to the NYC Survey, examining bullying by grade, the effect of student reported classroom safety on academic achievement, and the impact of school accountability grades on student reported school quality (Lacoe, 2016; Schwartz, Stiefel, & Rothbart, 2016; Rockoff & Turner, 2010).

Prior research by Rockoff and Speroni (2008) finds the NYC Survey to be an accurate reflection of student perceptions. They find responses are distinct and capture unique perspectives between teachers, students, and parents. Moreover, survey items have high internal consistency and strongly correlate with external measures of the learning environment (Schwartz, Stiefel, & Wiswall, 2016; Rockoff & Speroni 2008; Charbonneau & Van Ryzin, 2012; Nathanson, et. al., 2013). For example, Lacoe (2013) assesses the construct validity of the bullying measure by comparing it to school-level administrative measures of school violence and finds responses are highly correlated with school reports of violence.

Survey Measures

The NYC School Environment Survey includes questions about students' perceptions of bullying, fighting, respect, and feelings of safety. Table 1 lists the survey questions I use as measures of school climate. I treat each question as an individual outcome and code each as indicator variables equal to 1 if the student answered positively (i.e., None of the time/Some of

the time for *Bullying* and *Fighting,* and Agree/Strongly agree for *Respect*, *Safety: Class, Safety: Inside*, and *Safety: Outside*) and 0 otherwise.[4] As shown in Table 1, survey questions describe peer-reported, general student interactions (i.e., bullying, fighting, respect), as well as self-reported interactions in which the student is a participant (i.e., safety in class, inside, outside). Self-reported measures can provide insight into the perceptions of each specific student, while peer-reported measures are likely to paint a realistic picture of actual peer group interactions during unsupervised times of the school day (Graham, Bellmore, & Juvonen, 2003; Nakamoto & Schwartz, 2010).

Poverty Measures

While all students can participate in the school food program, eligibility for free or reduce-priced meals, in the absence of UFM, depends on student household income. I define student poverty by his or her certified eligibility for free/reduce-priced meals. Students certify eligible by either returning application forms or direct certification.[5] The majority of schools in NYC use students' direct certification status (i.e., whether the student participates in SNAP/TANF/Medicaid) to determine who is certified eligible for free meals, however many students are not certified via direct certification but are income eligible. These students can separately submit meal applications to be eligible for free/reduce-priced meals. However, the incentive to return applications, and therefore ability of researchers to identify students as poor, declines when schools adopt UFM where all students receive free meals. Therefore, using the free/reduce-priced status of students in UFM years may not be an accurate representation of the

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[4] Scholars find using binary indicators captures "empirical action" compared to other ways of categorizing such variables (Cannon, Jacknowitz, & Painter, 2006; Stiefel, Shiferaw, Schwartz, & Gottfried, 2018; Gibbons & Silva, 2011), not to mention ease of interpretation.

[5] A method by which schools match students to a state-provided database of SNAP/TANF/Medicaid participants.

income eligible population. Instead, I use students' poverty status via their certified eligibility for free/reduced price meals in years in which they were not exposed to UFM from 2010-2017.

Michelmore and Dynarski (2017) explore academic achievement by the frequency with which students are observed certified eligible for free/reduce-priced meals and find "sometimes poor" students perform worse than their "never poor" counterparts. However, students observed consistently poor perform far worse than both other groups. Because my poverty indicator directly relates to school meal participation, UFM may affect inconsistently certified eligible students differently than always or never certified students. Therefore, I use students' certified eligibility in nonUFM years to classify students as one of the following time-invariant statuses: *Always Poor, Sometimes Poor*, or *Never Poor*. *Always Poor* equals 1 if a student is consistently observed as poor (certified eligible) in all nonUFM years and 0 otherwise. *Sometimes Poor* equals 1 if the student is observed as poor in one nonUFM year and non-poor in another nonUFM year, and 0 otherwise. *Never Poor* equals 1 if a student is never observed poor in a nonUFM year, and 0 otherwise.

Participation Measures

Student breakfast participation (SBP) and lunch participation (SLP) refer to the percent of school days a student participated each year (i.e., the total number of breakfasts or lunches a student received, divided by the total number of school days in the school year). Daily meal transaction data is available for students who attend schools with Point-of-Service (POS) tracking systems which record meal transactions with student ID and time stamps. These systems require students to either enter their ID number on a keypad or swipe their ID card at the time of transaction to track student account information.

Figure 3 depicts SLP in 2013. A large share of students participates less than 10 percent of the year (~18 days). These are likely instances of students forgetting their brown bag lunch at home and substituting with school meals. The share of students participating more than 10 percent of the time levels off before gradually rising around 50 percent. UFM may affect students' participation and perceptions of school climate differently depending on their past participation behavior. For example, UFM may induce students who rarely participated last year to participate more often. Moreover, if these students did not participate for reasons other than price, UFM may affect their perceptions of school climate. To explore UFM's effect on student participation and perceptions of school climate at the extensive margin, I create the time-varying binary indicator, *Participant* equal to 1 in years in which a student participated in school lunch 10 percent of the time or more *in the prior year.* Similarly, *Non-Participant* is equal to 1 in years a student participated in school lunch less than 10 percent of the time.

Sample Description

The student-level data provided by the NYCDOE is matched using unique scrambled student IDs to each student's specific survey response for each year. Because students that ever attend a UFM school are likely different from students that never attend a UFM school, the sample of students includes only to 6th-12th grade students that attended a UFM school at least once from 2013-2017. The analytic sample used in this analysis includes students whose poverty status is observed in a nonUFM year from 2010-2017 and who have at least two years of meal participation and survey response data. Since students must have participation data to be included in the sample, any estimated changes in participation or perceptions cannot be attributed to students' new exposure to POS systems.

Table 2 presents descriptive statistics of Ever UFM students in 2013. Students in the

Analytic Sample (Column 2) resemble All Ever UFM students (Column 1). Columns 3-5 display

the characteristics of students in the Analytic Sample by subgroup: *Always Poor, Sometimes

Poor, and Never Poor.* Students characteristics differ across poverty subgroups. For example,

Always Poor students are more likely to be Hispanic, speak a language other than English at

home, and be ELL and SWD compared to their *Sometimes Poor* and *Never Poor* counterparts.

Never Poor students, on the other hand, are more likely to be white and less likely to be ELL and

SWD.

Always Poor students in sample participate in school meals most often (56 percent of

lunches and 13 percent of breakfasts), followed closely by *Sometimes Poor* students. However,

Never Poor students participate far less in lunch at 37 percent. *Never Poor* students are most

likely to positively perceive their school climate. For example, 78 percent of *Never Poor* students

report bullying occurs either none or some of the time, compared to 72 percent of *Always Poor*

students and 70 percent of *Sometimes Poor* students. Interestingly, *Sometimes Poor* students are

the least likely to positively perceive their school environment, consistently reporting 0.5 to 3.0

percentage points below *Always Poor* students. *Sometimes Poor* students may experience more

uncertainty than their *Always Poor* counterparts since they are eligible for free meals in some

years but not others. Given that baseline perceptions of *Sometimes Poor* students are lower than

Always Poor students, it is possible that UFM differentially affects their school climate

perceptions.

IV.   Empirical Strategy

Baseline Model

I use a difference-in-differences strategy with student fixed effects, comparing student perceptions of school climate before and after exposure to UFM from 2013-2017 to estimate the effect of UFM on school meal participation and student perceptions of school climate:

$$Y_{igst} = \beta_0 + \beta_1 UFM_{igst} + \beta_2 X'_{isgt} + \delta_i + \mu_g + \alpha_s + \gamma_t + \varepsilon_{igst} \qquad (1)$$

where Y_{igst} is a vector of continuous outcomes regarding meal participation (*SBP, SLP)* and binary outcomes of school climate (*Bullying, Fighting, Respect, Safety: Class, Safety: Inside,* and *Safety: Outside)* for student i, in grade g, in school s, in year t. UFM_{igst} takes a value of 1 if student i attends a UFM school in year t. X'_{isgt} is a vector of time-varying student characteristics including ELL and SWD status. Robust standard errors are clustered at the school level, and δ_i, μ_g, α_s, and γ_t are student, grade, school, and year fixed effects, respectively. Given the large size of my panel and therefore, the availability of four different fixed effects, I can compare students to themselves over time, as well as within school while controlling for idiosyncrasies across grades and time. β_1 reflects the effect of UFM exposure on each outcome.

Heterogeneous Effects of UFM

My poverty indicators are directly related to participation in school food since they are based on the price students pay for school meals in the absence of UFM. This, in combination with how students' poverty status might affect how they are perceived at school may lead to differential effects of UFM on student participation and perceptions. Therefore, I examine the effect of UFM by poverty status by interacting a student's time-invariant poverty indicator (i.e., *Always Poor, Sometimes Poor, Never Poor*) with their time-varying UFM status. The coefficient

on each interaction identifies the effect of UFM on meal participation and perceptions for each type of student. Because UFM eliminates prices, one might expect participation to increase among those who have previously paid (i.e., Sometimes and Never Poor students). In addition, because UFM potentially removes visible signals of poverty for those ever having been in poverty (i.e., Always and Sometimes Poor students), one might expect these students' perceptions to improve relative to their Never Poor counterparts.

Furthermore, if students base participation decisions on price and/or attitudes toward school food, it is likely that UFM differentially affects student participation and perceptions by participant status. Consequently, I interact each student's prior year participant status (i.e., *Participant, Non-Participant*) with their time varying UFM status. An increase in participation among Non-Participants means UFM induces students to participate, whereas an increase in participation among Participants signifies an increase in the intensity with which students participate. If students associate some sort of stigma with participation in school food, one might expect improvements in perceptions among those that have a history of participating (i.e., Participants).

Prior literature finds increased participation in school lunch post UFM exposure among both poor and nonpoor students (Schwartz & Rothbart, 2019). However, whether students change participation at the intensive or extensive margin remains unknown. The decision to change participation behavior could be a function of several factors, including meal prices and attitudes toward school food. By identifying students using both their participation and poverty status *in the year prior* to UFM exposure, I can examine the heterogeneous effects of UFM on

meal participation and student perceptions. Therefore, I restrict the sample to students for whom I observe the year prior to UFM exposure and estimate the following model:

$$Y_{igst} = \beta_0 + \beta_1 UFM_{igst} * PoorParticipant_{t-1} + \beta_2 UFM_{igst} * PoorNonParticipant_{t-1} +$$
$$\beta_3 UFM_{igst} * NonPoorParticipant_{t-1} + \beta_4 UFM_{igst} * NonPoorNonParticipant_{t-1}$$
$$+ \beta_5 X'_{isgt} + \delta_i + \mu_g + \alpha_s + \gamma_t + \varepsilon_{igst} \qquad (2)$$

where *PoorParticipant* is an indicator equal to 1 if the student was certified eligible for free/reduce-priced meals and was a Participant in the prior, nonUFM year. *NonPoorParticipant* equals 1 if the student was not certified eligible and was a Participant. *PoorNonParticipant* equals 1 if the student was certified eligible and was not a Participant, and *NonPoorNonParticipant* equals 1 if the student was not certified eligible and was not a Participant.

Each indicator is interacted with UFM, the coefficient of which identifies the effect of UFM on meal participation and perceptions of school climate for each type of student. For example, *NonPoorNonParticipants* were required to pay for school lunch and did not participate prior to UFM. Therefore, if these students increase SLP post UFM, it is likely due to the decrease in price. However, *PoorNonParticipants* would have received free meals in the absence of UFM and did not participate. If these students increase SLP under UFM where meals are still free, it cannot be attributed to the removal of price barriers. Instead, it is likely due to the other avenue in which UFM can affect participation and perceptions, including factors such as the removal of welfare signals, effects of hunger, and/or composition of the cafeteria (Figure 1).

I use an event study design to examine whether there are pre-trends in school climate responses prior to UFM exposure. For this analysis, I restrict the sample to students that were exposed to UFM for the first time between 2013 and 2017 and include these students' survey responses from previous years (2010-2012). I compare students that were exposed to UFM early (e.g., 2013) to those that were exposed later (e.g., 2017) and conduct the analysis using:

$$Y_{igst} = \beta_0 + \boldsymbol{UFM\_Year}'_{igst}\boldsymbol{\beta}'_1 + \boldsymbol{X}'_{isgt}\boldsymbol{\beta}'_2 + \delta_i + \mu_g + \alpha_s + \gamma_t + \varepsilon_{igst} \quad (3)$$

where $\boldsymbol{UFM\_Year}'_{igst}$ is a vector of binary indicators equal to 1 for each year prior to and post UFM exposure. A large share of the variation in treatment comes from the citywide rollout of UFM to all stand-alone middle schools in 2015. The majority of students first exposed between 2013 and 2017 are 7th and 8th graders that, within 1 or 2 years, lose UFM when they move from their UFM middle school to a nonUFM high school. Therefore, post treatment effects should be interpreted as intent-to-treat (ITT) effects and will likely not resemble the average treatment effect on the treated (ATT) effects estimated in difference-in-differences models. I find pretreatment estimates are statistically indistinguishable from zero (see Figure 4), meaning students are not already experiencing improvements in school climate perceptions prior to UFM exposure.

While students lose treatment during this time period, schools that adopt UFM keep it. Therefore, I also conduct this analysis at the school level using school fixed effects and compare *Ever UFM* schools that adopt UFM early to those that adopt later. I examine the pretreatment outcomes among *Ever UFM* schools from 2010-2017 and find pretreatment estimates are

statistically indistinguishable from zero (see Figure 5), meaning schools do not appear to adopt UFM based on student perceptions of school environment.

V.   Results

Baseline Results

Table 3 shows the effects of UFM on student school meal participation and perceptions of school climate. On average, there is no evidence that UFM increases SBP, which is unsurprising. Because breakfast in NYC has been free since 2004, students do not experience a price change in breakfast under UFM. There is also not strong evidence the UFM increases SLP, which is somewhat unexpected. Prior literature finds UFM increases SLP, and while the point estimate on SLP is positive, it is not statistically significant. It is likely that students facing different price barriers react differently to UFM. Therefore, I further explore heterogeneous effects of UFM on SBP and SLP in the next section.

The effects of UFM on student perceptions of school climate are shown in columns 3-8. Overall, UFM improves student perceptions of bullying, fighting, and safety outside of school with no effect on perceptions of respect, safety in class, or safety inside. UFM improves perceptions of bullying by 2.5 percentage points. While the point estimate may appear small, it is important to remember this analysis takes place in NYC and includes over 100,000 students. To better grasp the magnitude of these effects, 72.3 percent of students reported positive perceptions of bullying in 2013. Therefore, UFM improved perceptions of bullying for 3.5 percent – more than 2,500 students.

UFM improves perceptions of fighting by 3.3 percentage points and feelings of safety outside by 2.3 percentage points.[6] It is likely that UFM changes the composition of students in the cafeteria. Under UFM, students in schools with off-campus lunch policies may be incentivized by free meals to join the cafeteria crowd instead of venturing off campus.[7] If UFM reduces the number of times students take off-campus lunch, it is possible that students are outside less and have fewer opportunities to feel unsafe – leading to an improvement in reported safety outside around the school.

Heterogeneous Effects of UFM

In aggregate, UFM does not affect school meal participation rates. However, effects likely vary by poverty status, as these students face differential price barriers and attitudes toward school food. Upon further examination of heterogeneous effects in Table 4, I find UFM increases SLP among *Sometimes* and *Never Poor* students by 7.3 and 11.8 percentage points, respectively. These results are expected given that students who would have paid for school meals in the absence of UFM now receive the same meals for free. However, I continue to find no effect of UFM on SBP, regardless of student poverty status.

Students who have ever certified eligible for free or reduce-priced meals (*Sometimes* or *Always Poor)* are less likely to report baseline positive perceptions of school climate compared to their *Never Poor* counterparts. School food in the absence of UFM provides opportunities to identify these students as poor and could therefore likely influence their school climate

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[6] School meal participation rates in high school are, on average, lower compared to middle school students. Appendix Table A10 shows the effects of UFM on participation and student perception of school climate by middle and high school grades. UFM increases school lunch participation among high schoolers by 15.0 percentage points. The majority of effects on student perceptions (bullying, fighting, and safety outside) happen among middle school students, whereas UFM improves high school students' perception of safety inside.
[7] Specific off-campus policy data available for NYC is unreliable and inconsistent.

perceptions. However, UFM removes the price of school food and the associated signals of socioeconomic status. Table 4, columns 3-8 show the heterogeneous effects of UFM on perceptions by poverty status. UFM shows no effects on perceptions of respect or safety in class, consistent with aggregated effects. Interestingly, all students – regardless of poverty status – report improvements in perceptions of bullying, fighting, and safety outside. UFM improves perceptions of bullying by 2.2-3.2 percentage points, fighting by 3.1-3.9 percentage points, and safety outside of school by 2.0-2.8 percentage points. While one might argue that UFM only removes the stigma associated with free school food for those that are certified eligible for free meals (i.e., Always and Sometimes Poor students), it is the case UFM improves perceptions among all students, including Never Poor students.

One of the "less supervised" areas referred to in *Safe: Inside* is the cafeteria. This question is significant because UFM takes place in the cafeteria. It is possible that, in the absence of UFM, students who have ever been eligible for free meals are stigmatized by their peers for being associated with free meals. These identifications can lead to potential instances of bullying or violence. *Always* and *Sometimes Poor* students report improvements in peer-reported perceptions of bullying and fighting under UFM. However, *Safe: Inside* reveals self-reported information. As shown in column 7, *Always* and *Sometimes Poor* students report feeling safer inside the school (including the cafeteria) by 2.2-2.4 percentage points post UFM exposure. It is possible that these students not only perceive improvements in bullying and fighting overall, but that they themselves were the potential victims of bullying prior to UFM.[8]

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[8] Safe: Inside point estimates for Always and Sometimes Poor students are statistically different from Never Poor students at the 10 percent level.

Table 5 shows the effects of UFM by participant status. UFM increases SLP by 3.2 percentage points for students on the intensive margin – that is, those that already participated 10 percent of the time or more in the prior year. *Non-Participants*, on the other hand, are no more likely to participate in school lunch post UFM exposure. Both *Participants* and *Non-Participants* report improved perceptions of bullying by 3.7-4.7 percentage points, fighting by 5.1-5.6 percentage points, and safety outside by 3.3-4.2 percentage points. This means that UFM improves school climate perceptions for all students, regardless of past participation status, as opposed to those that have participated and therefore may be more likely to perceive school climate negatively.

Similar to *Sometimes* and *Always Poor* students, *Participants* may be stigmatized by peers as "poor" for merely participating in school food. In addition, the majority of students in the sample are *Sometimes* or *Always Poor.* Therefore, if students participated, it is likely they were, at some point, eligible for free meals. Just as *Participants* report improvements in peer-reported measures of bullying and fighting, they report improvements in self-reported safety by 2.7 percentage points in less supervised areas. This is, again, consistent with the theory that those associated with school food may be the victims of the bullying and fighting that occur in the absence of UFM.

Schwartz and Rothbart (2019) find UFM increases participation among both poor and nonpoor NYC middle school students. I find increased SLP for all but the poorest 6th-12th grade students. The decision to participate in school food depends on several factors, including meal price. However, if students who were certified to receive free meals in the prior year increase participation rates once exposed to UFM – when meals are still free – there must be a factor other than price affecting their decisions to participate. I further explore the effect of UFM on

participation and perceptions of school climate by examining students' participation and poverty status in the year prior to UFM exposure. In the prior year, students are either certified to receive free meals or they are not. Therefore, they are either *Poor* or *NonPoor*. Similarly, students either participated or they did not, and are, therefore, either a *Participant* or a *Non-Participant.*

Table 6 shows the impact of UFM by the interaction of student poverty and participation status in the prior, nonUFM year. Students that were certified to receive free meals but did not participate in the prior year (*PoorNonParticipants)* increase SBP by 4.8 percentage points and SLP by 21.4 percentage points post UFM. Notably, these students did not experience a price change between the prior year and exposure to UFM, suggesting that UFM may eliminate some non-price related barriers to participation and even induce students to participate at the extensive margin.

NonPoorParticipants and *NonPoorNonParticipants,* those that faced a price for meals in the prior year, increase SLP by 9.8 and 21.9 percentage points, respectively. These students experience a price change and increase participation on both the intensive and extensive margins. Meanwhile, UFM does not increase SLP on the intensive margin for those that were eligible for free meals and already participating – *PoorParticipants*. Almost all students report improvements in perception of bullying by 5.1-7.7 percentage points, fighting by 6.8-9.0 percentage points, and safety in the classroom by 4.1-4.5 percentage points. I find no effects on perceptions of respect and positive, but insignificant, point estimates for safety inside and outside.

In summary, I find UFM increases SLP among students who have ever been required to pay for meals in the absence of UFM, as well as students who previously participated in school food. UFM improves perceptions of bullying, fighting, and safety outside the school for all

students, regardless of poverty or prior participation behavior. Notably, UFM improves self-reported feelings of safety in less supervised areas among students that may have been marked by their peers as "poor" in the absence of UFM. By investigating effects for students in the year prior to UFM, I find UFM induced participation in both breakfast and lunch among students who, in the previous year were eligible for free meals but did not participate. This finding provides evidence that students' decision to participate consists of factors other than price – such as fear of signaling socioeconomic status via associating with free school food.

Falsification Tests

To provide empirical evidence of exogeneity in student exposure to UFM, I conduct two falsification tests. The first predicts timing of student exposure to UFM using student characteristics and student fixed effects, and the second predicts the timing of schools' UFM adoption using school characteristics and school fixed effects. I restrict the sample to students (schools) without UFM in year t to predict exposure in year t+1 using

$$UFM_{igst+1} = \beta_0 + \beta_1 X'_{isgt} + \delta_i + \mu_g + \gamma_t + \varepsilon_{igst} \qquad (4)$$

where X'_{isgt} is a vector of the previously described outcomes and student (school) characteristics. Additional characteristics include indicators for whether the student (school) has meal transaction availability and principal turnover. As shown in Table 7, Panels A and B student and/or school characteristics do not predict UFM exposure or adoption in the next year.

Robustness Checks

UFM may improve student perceptions of school climate differently over time. For example, the first year of UFM may improve perceptions among students but dwindle as UFM becomes the "new normal." Alternatively, UFM may, on the whole, boost student perceptions of

school climate in a consistent and continuous manner. NYC expanded UFM to all free-standing middle schools serving grades 6-8 in 2015. Therefore, a large share of students in my sample are treated in 2015 in 7th and 8th grade, and then lose UFM once they move to a high school without UFM, making it difficult to capture long terms effects of UFM. However, once schools adopt UFM, very few remove it. I examine the long-term effects of UFM at the school level to capture aggregated student perceptions of the school climate in the first, second, and third-plus years of treatment using:

$$Y_{st} = \beta_0 + \beta_1 Year1_{st} + \beta_2 Year2_{st} + \beta_3 Year3_{st} + \beta_4 X'_{gt} + \alpha_s + \gamma_t + \varepsilon_{st} \tag{5}$$

where Year1 takes a value of 1 in the first year of UFM adoption between 2011 and 2017 and 0 otherwise.[9] Year2 takes a value of 1 in the 2nd year of UFM adoption and 0 otherwise, and Year3+ takes a value of 1 in the third year and beyond, and 0 otherwise. X'_{gt} is a vector of control covariates including the percent SWD, ELL, Black, White, and Asian, and α_s and γ_t are school and year fixed effects. As shown in Table A1, UFM improves student perceptions of bullying, fighting, and all types of safety, though effects dissipate over time for bullying. Table A2 shows the long-term effects of UFM at the student level. Given that a large share of students lose UFM within 1 to 2 years, we find little in terms of long-term effects of UFM at the student level.

A nontrivial number of students retained in high school remain classified as 9th graders, and sometimes 10th graders, since students must accumulate credit hours to move on to the next grade. This could alter the effects of UFM if the effect for 9th graders are not estimated using the

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[9] To identify which year is the first year of UFM adoption, I have to observe the UFM status in the prior year. Therefore, I use schools that adopt for the first time in 2011.

typical 9ᵗʰ grader definition. Table A3 shows that results are robust to removing these ever-retained students.

Additionally, because survey questions are presented in a Likert scale format and are coded as binary indicators, results may be sensitive to the way in which answers are coded. I recode responses in two ways. First, the binary variable is equal to 1 if the answer resembles anything better than the worst possible response. For example, the bullying question (i.e., At this school, students harass or bully other students), is given a binary indicator equal to 1 for responses "None of the time," "Some of the time," and "Most of the time," and 0 for "All of the time." This identifies changes students make from the worst possible answer to anything better. Table A4, Panel A shows results using this alternate definition and though point estimates are positive, they are smaller and insignificant compared to baseline results.

Second, I recode responses using a binary variable equal to 1 if the response is the best possible answer and 0 otherwise. For example, the binary indicator for the bullying question is equal to 1 for "None of the time," and 0 for "Some of the time," Most of the time," and "All of the time." This identifies changes students make from any "worse" response to the "best" response. Table A4 Panel B shows results using this second alternate definition. Point estimates are positive in direction, and though the bullying estimate loses statistical significance, safety in class and inside gain in size and statistical significance. Overall, results are not sensitive to alternate classifications of Likert scale responses.

Survey designers added "I Don't Know" as a fifth available response to "Respect" from 2015 to 2017. These responses are coded as missing in baseline analyses. Table A5 demonstrates that students who responded "I Don't Know" are more likely male, Hispanic, and to speak another language at home. As a robustness check, I recode "I Don't Know" responses to be

neutral (0.5 on a scale from 0 – 1) instead of missing and find results do not change significantly, though point estimates change from negative to positive (Table A6).

Lastly, I conduct a Chronbach's alpha analysis to determine whether these survey questions are, overall, representative of school climate, as well as a factor analysis to determine whether questions can be differentiated from one another. Table A7 shows that, in aggregate, questions have a Chronbach's alpha of 0.8. This indicates that responses to questions move in the same direction and are therefore representative of school climate. Furthermore, a factor analysis in Table A8 demonstrates that all safety questions load onto one factor (i.e., Factor 1), whereas bullying, fighting, and respect roughly load onto a second factor (i.e., Factor 2) – though respect loads at a lower rate. As a robustness check, I create Safety Factor 1 and Peer Factor 2 by summing the binary indicators used in the baseline models. Table A9 shows results using these two factor indices. UFM improves students' perceptions of overall safety by 4.9 percentage points and students' perceptions of peer interactions by 5.7 percentage points. These effects on Factor 1 and Factor 2 remain present across poverty and participant status, though point estimates are not statistically different from each other.

VI. Conclusion

Advocates claim UFM increases participation in school food and reduces the stigma associated with participation. Indeed, prior research finds not only does UFM increase participation, it improves test scores, diminishes instances of bad behavior, and provides suggestive evidence of improved weight outcomes for students in participating schools. However, previous research has yet to examine specifically *which* students change participation behavior and the associated changes in student perceptions of school climate.

How students perceive their school climate has consequences for their social and emotional well-being, as well as their academic success. UFM makes meals free for all students and potentially removes visible signals of socioeconomic status. Therefore, UFM has the potential to improve interactions between students in the cafeteria and beyond. Moreover, UFM could differentially affect student participation and perceptions based on their poverty status and/or prior participation behavior.

This paper investigates whether and for whom UFM induces students to change participation behavior, as well as whether and to what extent UFM improves students' school climate perceptions. Using a difference-in-differences framework with student fixed effects, I exploit the staggered exposure of UFM among students ever exposed to UFM. I find UFM increases lunch participation among students with a history of paying for school meals (*Sometimes* and *Never Poor* students). However, students from all poverty and participation designations report improvements in bullying, fighting, and safety outside of school. Notably, students with a history of interacting with school food (*Sometimes* and *Always Poor* students and *Participants)* self-report feeling safer inside the school in less supervised areas, including the cafeteria where UFM takes place. A key finding from this study is that students for whom meals are always free but do not participate prior to UFM (*PoorNonParticipants*) increase participation in school meals under UFM. These students change participation behavior without being subject to price changes, supporting the theory that other factors beyond the price of school food – such as stigma – contribute to students' participation decisions, and that UFM may alleviate these concerns for students.

Though UFM is often directed at improving circumstances for poor or near-poor students, it appears that UFM positively affects student perceptions of school climate, regardless

of poverty or prior participation. UFM removes the visible indicators of socioeconomic status associated with free school food. Furthermore, the price removal aspect of UFM can support a more communal and positive atmosphere, as well as cultivate more positive (or at the least fewer negative) interactions between students. Similar to positive effects associated with school uniform policies, these findings suggest that UFM improves school climate perceptions for all students.

While these results are robust to different specifications, results found here are limited to 6th-12th grade students – students who have more autonomy in their school meal participation behaviors. Furthermore, NYC public school students are more likely to be income eligible for free/reduce-priced meals than students in a typical US school district. Moreover, given the cost of living of NYC, even "non-poor" public school students are not what one might consider "high-income."

These results provide the first empirical evidence that UFM improves students' perceptions of school climate. Prior research that examines the effect of UFM on test scores, participation, attendance, and obesity often cites a reduction in hunger and stigma as mechanisms through which UFM might affect these other outcomes. Not only are school climate outcomes examined here an important contribution to the gap in the literature, they can help explain prior findings. School climate influences student social, emotional, and academic wellbeing. Therefore, while UFM aims to provide free meals for those that might otherwise go hungry, the results in this paper suggest that UFM also improves student perceptions of school climate and, in turn, improves student experiences and welfare.

Figure 1: Pathways UFM May Influence School Climate Perceptions
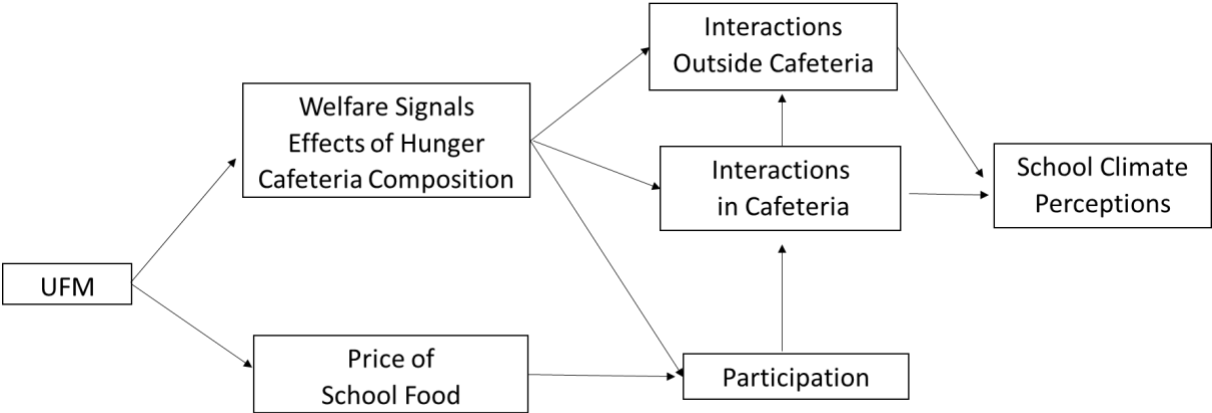
Figure 2: Introductory Instructions for NYC Student Survey, 2016

NYC SCHOOL SURVEY
2016 Student Survey
Go GREEN! Please take this survey on-line! Go to www.nycschoolsurvey.org.

Department of Education

We want to know what YOU think about your school. This survey will give your school important information it can use to improve your education.

This survey is confidential. Your answers will be combined with those of other students at your school. No one at your school will ever see your individual answers. This is not a test and there are no wrong answers. You do not have to answer any question you do not wish to answer, but we hope you will answer as many questions as you can.

When you have finished the survey, include only the answer sheet in the envelope provided and seal the envelope. You may remove your name from the envelope by peeling the label with your name off of the front of the envelope. Hand the sealed envelope with your completed answer sheet to your teacher.

Figure 3: Distribution of Student Lunch Participation, 2013
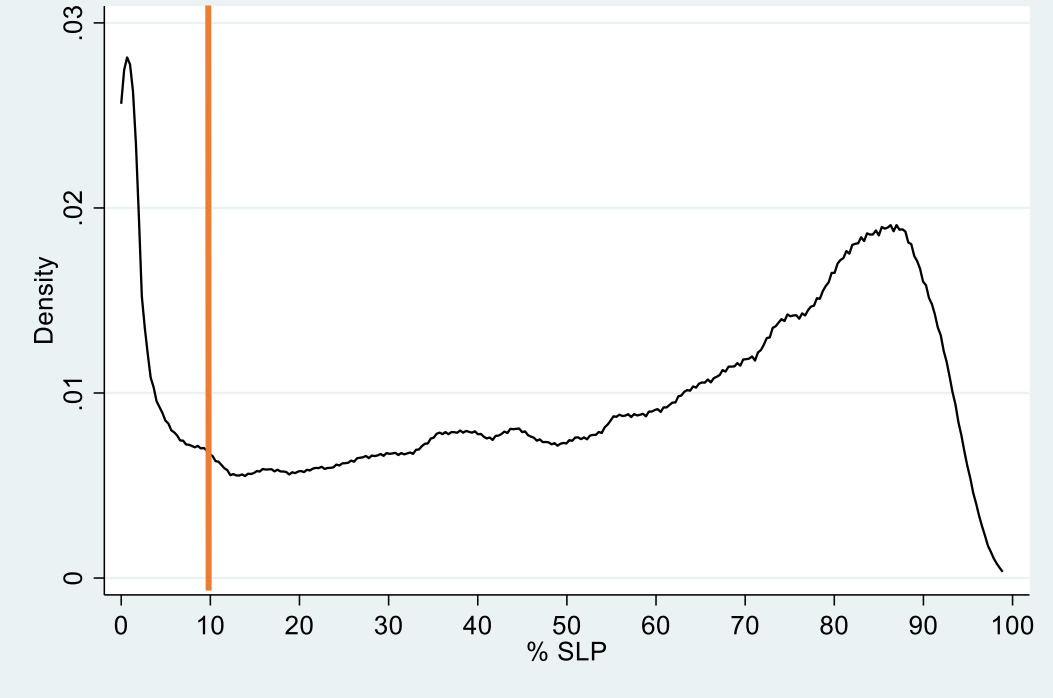
Figure 4. Pre-trend & Event Study Analysis: Initial Exposure as Intent to Treat (ITT), Student-Level, 2010-2017
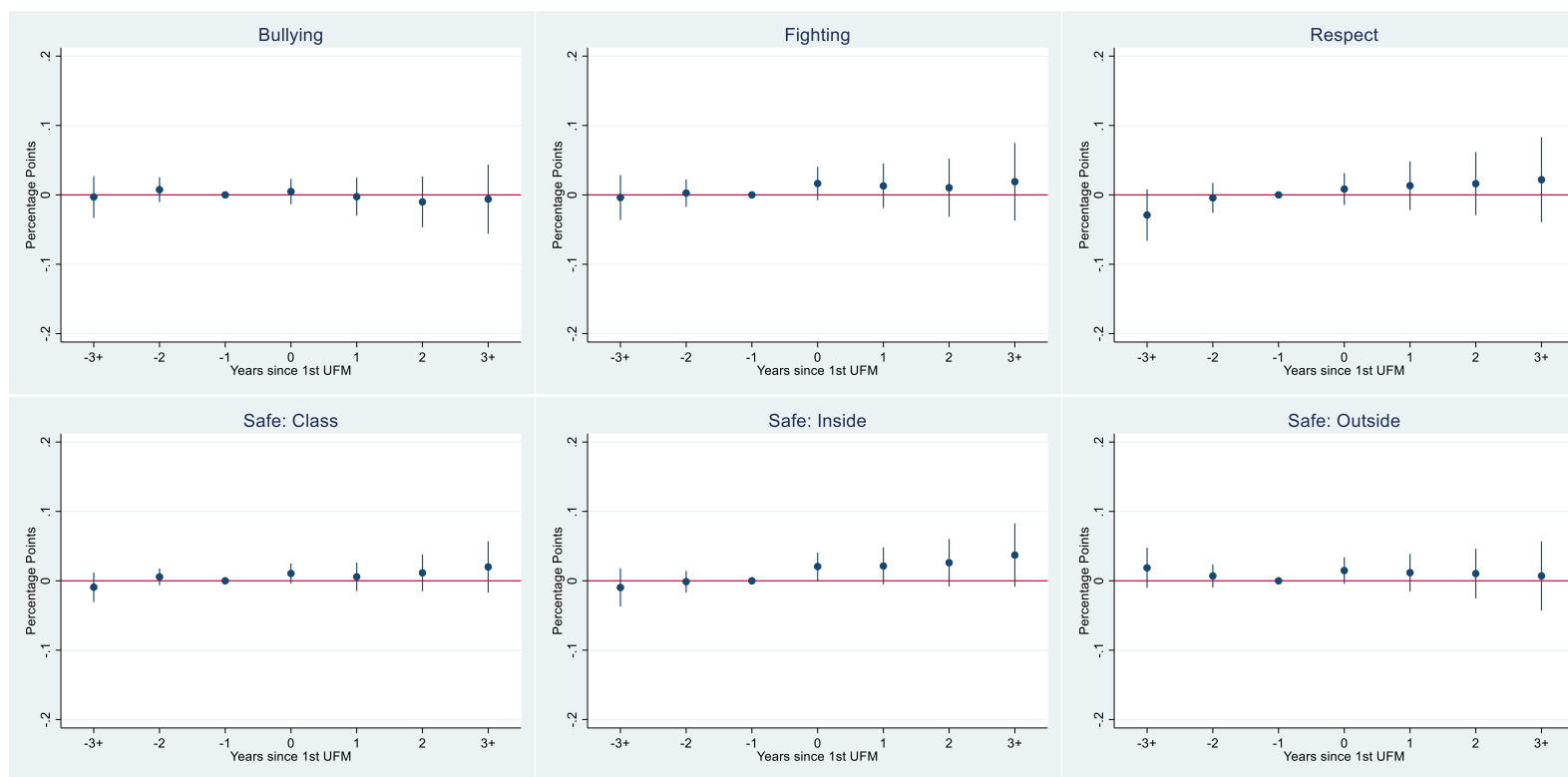
Notes: Figures display point estimates and bars indicate 95 percent confidence intervals from pre-trend analysis of Ever UFM students first exposed to UFM between 2013-2017 (~85,638 students in ~998 schools). Students exposed to UFM prior to 2013 and students that are "always" UFM from 2013 to 2017 are excluded from this analysis. Models control for SWD and ELL status and include student, grade, school, and year fixed effects. Robust standard errors clustered by school. Zero (0) is the first year of UFM exposure and negative 1 (-1) is the reference year, the year prior to UFM exposure. Data used to estimate "-3+" includes 3 or more years pretreatment data, and data used to estimate "3+" includes 3 or more years of post-treatment data.

Figure 5. Pre-trend & Event Study Analysis: Initial Adoption as Intent to Treat (ITT), School-Level, 2010-2017
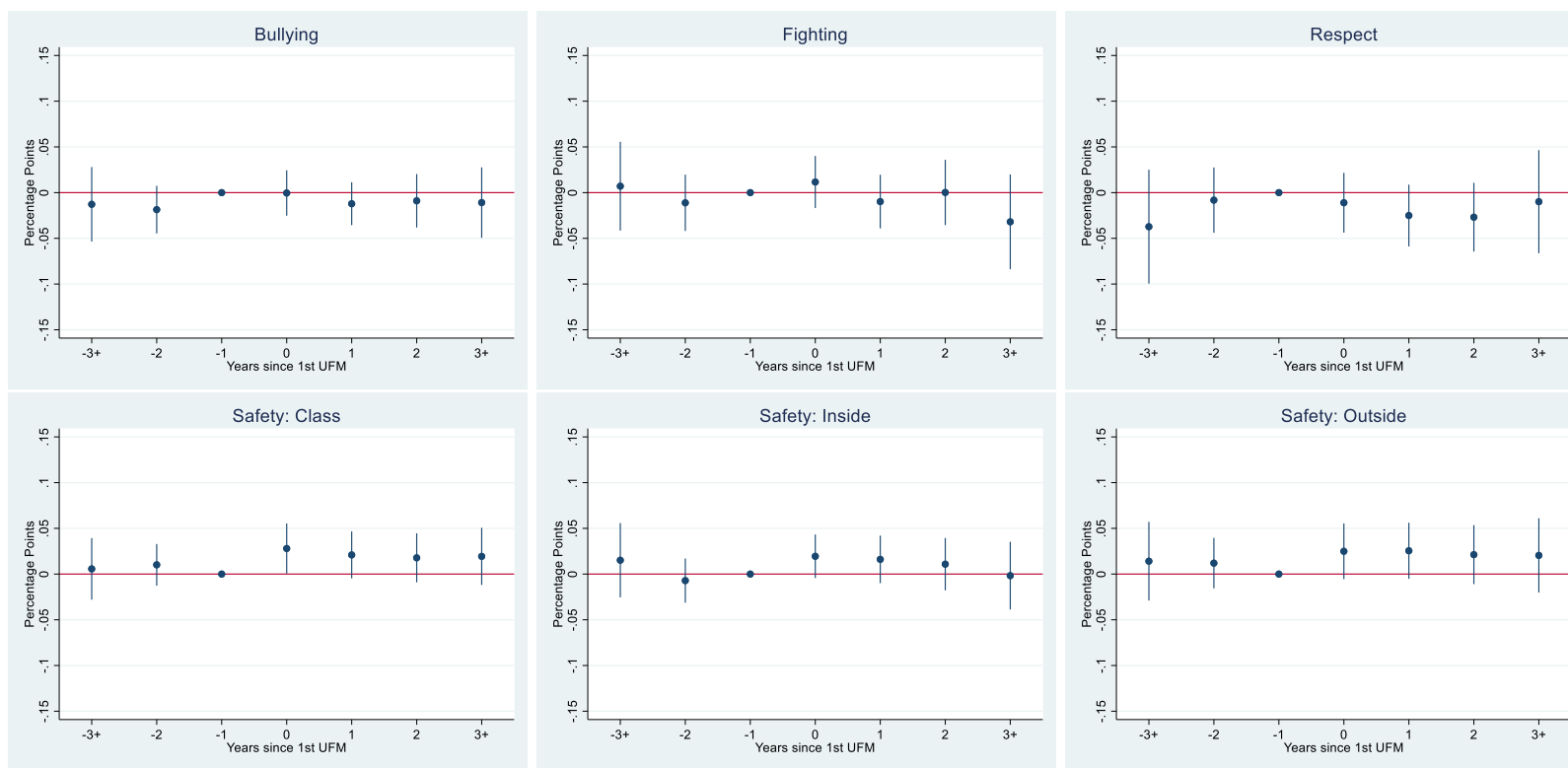
Notes: Figures display point estimates and bars indicate 95 percent confidence intervals from event study of Ever UFM schools from 2010-2017 (~2,900 observations of ~400 schools). Always UFM schools (111) are used to estimate post effects. Models control for percent SWD, ELL, Poor, Black, White, Hispanic, and Asian and include school and year fixed effects. Robust standard errors clustered by school. Zero (0) is the first year of UFM exposure and negative 1 (-1) is the reference year, the year prior to UFM exposure. Data used to estimate "-3+" includes 3 or more years pretreatment data, and data used to estimate "3+" includes 3 or more years of post-treatment data.

Table 1: Measures of Bullying, Fighting, Respect, and Safety

Category	New York City School Survey Question	Variable Name	=1 If Respond
Bullying	"At this school, students harass or bully other students."	Bullying	None or some of the time
Fighting	"At this school, students get into physical fights."	Fighting	
Respect	"Most students at this school treat each other with respect."	Respect	
Safety	"I feel safe in my classes at this school."	Safe: Class	Agree or strongly agree
	"I feel safe in the hallways, bathrooms, locker rooms, and cafeteria of this school."	Safe: Inside	
	"I feel safe outside around this school."	Safe: Outside	

Table 2: Characteristics of 6ᵗʰ-12ᵗʰ Grade Ever UFM Students, 2013

	All Ever UFM	Analytic Sample	Analytic Sample		
			Always	**Sometimes**	**Never**
Characteristics					
Female	50.2	50.0	50.5	50.0	47.6
White	11.3	14.4	7.3	17.7	43.5
Black	24.0	22.8	23.5	26.3	15.8
Hispanic	47.3	42.2	49.3	32.8	20.3
Asian	16.5	19.7	19.1	22.1	19.7
Other Language	50.4	50.4	56.4	44.5	29.5
ELL	14.1	12.1	15.2	7.5	3.3
SWD	13.0	12.0	12.6	11.5	9.8
Mean No. Obs.	3.9	4.0	3.9	4.4	4.0
Mean Grade	7.1	7.0	7.2	6.6	6.6
Outcomes					
SBP	12.8	12.2	13.4	10.5	8.6
SLP	51.8	52.4	56.5	50.0	36.7
Bullying	73.9	72.3	71.7	70.2	77.7
Fighting	78.7	77.1	77.3	74.5	79.0
Respect	74.2	73.2	73.1	71.3	75.5
Safe: Class	59.6	58.3	58.5	55.0	60.9
Safe: Inside	84.4	83.8	84.0	81.9	85.2
Safe: Outside	88.2	87.9	87.4	86.9	91.0
# Students	83,135	33,553	22,868	5,684	5,001

Notes: Ever UFM students in 6ᵗʰ to 12ᵗʰ grade with at least two years of data from 2013-2017. Analytic sample includes students whose poverty status is observed in a non-UFM year and students with meal participation data.

Table 3: The Effect of UFM on Meal Participation and Perceptions, 2013-2017

	(1) SBP	(2) SLP	(3) Bullying	(4) Fighting	(5) Respect	(6) Safe: Class	(7) Safe: Inside	(8) Safe: Outside
UFM	-0.003	0.019	0.025**	0.033**	-0.002	0.004	0.020	0.023**
	(0.016)	(0.016)	(0.011)	(0.017)	(0.014)	(0.010)	(0.012)	(0.011)
Student Char	Y	Y	Y	Y	Y	Y	Y	Y
Student FE	Y	Y	Y	Y	Y	Y	Y	Y
Grade FE	Y	Y	Y	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
2013 Means	0.122	0.524	0.723	0.771	0.732	0.583	0.838	0.879
No Students	102,895	102,895	100,109	99,947	95,647	100,847	101,034	100,927
No Schools	867	867	863	863	861	863	862	864
Observations	325,334	325,334	310,875	310,507	290,502	315,743	316,418	315,863
R-squared	0.646	0.739	0.489	0.517	0.525	0.440	0.472	0.483

Notes: Robust standard errors in parentheses clustered by school (*p < .10; **p<.05; ***p<.01). Sample includes observations of Ever UFM/POS students in 6th to 12th grade with at least two years of data, whose middle or high school poverty status is observed in a nonUFM year from 2010-2017. Models in columns 3-8 control for cohort-specific linear time trends. Student characteristics include indicators for SWD and ELL.

Table 4: The Effect of UFM on Meal Participation and Perceptions by Poverty, 2013-2017

VARIABLES	(1) SBP	(2) SLP	(3) Bullying	(4) Fighting	(5) Respect	(6) Safe: Class	(7) Safe: Inside	(8) Safe: Outside
UFM								
Always Poor	-0.007	-0.027	0.022**	0.031*	-0.002	0.006	0.022*	0.020*
	(0.016)	(0.017)	(0.011)	(0.017)	(0.014)	(0.010)	(0.012)	(0.011)
Sometimes Poor	0.000	0.073***	0.032***	0.033*	0.007	0.003	0.024*	0.028**
	(0.016)	(0.016)	(0.012)	(0.018)	(0.015)	(0.011)	(0.014)	(0.012)
Never Poor	0.009	0.118***	0.030**	0.039**	-0.005	-0.003	0.012	0.028**
	(0.015)	(0.014)	(0.013)	(0.017)	(0.015)	(0.009)	(0.013)	(0.013)
Student Char	Y	Y	Y	Y	Y	Y	Y	Y
Student FE	Y	Y	Y	Y	Y	Y	Y	Y
Grade FE	Y	Y	Y	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
No Students	102,895	102,895	100,109	99,947	95,647	100,847	101,034	100,927
No Schools	867	867	863	863	861	863	862	864
Observations	325,334	325,334	310,875	310,507	290,502	315,743	316,418	315,863
R-squared	0.646	0.744	0.489	0.517	0.525	0.440	0.472	0.483

Notes: Robust standard errors in parentheses clustered by school (*p < .10; **p<.05; ***p<.01). Sample includes observations of Ever UFM/POS students in 6th to 12th grade with at least two years of data, whose middle or high school poverty status is observed in a nonUFM year from 2010-2017. Student characteristics include indicators for SWD and ELL. Models in columns 3-8 control for cohort-specific linear time trends. Sample includes ~62,700 (72 percent) Always Poor, ~10,600 (12 percent) Sometimes Poor, and ~14,000 (16 percent) Never Poor students. All SLP point estimates are statistically different from the other at the 1 percent level. Bullying point estimates are not statistically different from each other, with the exception of comparing Always and Sometimes Poor, which is statistically different at the 10 percent level. Individual Fighting and Safe: Outside point estimates are not statistically different from each other. Safe: Inside point estimates are statistically different from each other at the 10 percent level, with the exception of Never and Sometimes Poor estimates.

Table 5: The Effect of UFM on Meal Participation and Perceptions by Participant Status, 2013-2017

VARIABLES	(1) SBP	(2) SLP	(3) Bullying	(4) Fighting	(5) Respect	(6) Safe: Class	(7) Safe: Inside	(8) Safe: Outside
UFM								
Participant	-0.003	0.032*	0.037***	0.051***	0.017	0.007	0.027*	0.033**
	(0.015)	(0.018)	(0.014)	(0.019)	(0.018)	(0.012)	(0.014)	(0.013)
NonParticipant	-0.007	-0.010	0.047***	0.056***	0.022	0.005	0.021	0.042***
	(0.015)	(0.018)	(0.016)	(0.020)	(0.019)	(0.013)	(0.016)	(0.015)
Student Char	Y	Y	Y	Y	Y	Y	Y	Y
Student FE	Y	Y	Y	Y	Y	Y	Y	Y
Grade FE	Y	Y	Y	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
No Students	73,001	73,001	70,589	70,463	66,122	71,294	71,389	71,289
No Schools	788	788	783	784	776	785	785	785
Observations	200,717	200,717	191,952	191,587	176,476	194,730	195,080	194,716
R-squared	0.692	0.780	0.532	0.558	0.572	0.486	0.517	0.531

Notes: Robust standard errors in parentheses clustered by school (*p < .10; **p<.05; ***p<.01 Sample includes observations of Ever UFM/POS students in 6th to 12th grade with at least two years of data, whose middle or high school poverty status is observed in a nonUFM year from 2010-2017. Sample uses last year's participation status, and therefore loses one year of observations. Models in columns 3-8 control for cohort-specific linear time trends. Student characteristics include indicators for SWD and ELL. Sample includes ~51,800 (80 percent) Participants and ~13,900 (20 percent) Non-Participants. Participant and NonParticipant point estimates for bullying, fighting, and safety outside are not statistically different from each other.

Table 6: Heterogeneous Effects of UFM on Meal Participation and Perceptions by Poverty and Participant Status in Prior, nonUFM Year, 2013-2017

VARIABLES	(1) SBP	(2) SLP	(3) Bullying	(4) Fighting	(5) Respect	(6) Safe: Class	(7) Safe: Inside	(8) Safe: Outside
UFM								
PoorParticipant	0.012	0.028	0.051*	0.068**	-0.006	0.045**	0.023	-0.003
	(0.017)	(0.022)	(0.030)	(0.034)	(0.038)	(0.019)	(0.026)	(0.028)
PoorNonParticipant	0.048***	0.214***	0.052	0.076*	-0.022	0.044*	0.014	0.006
	(0.015)	(0.019)	(0.034)	(0.039)	(0.038)	(0.023)	(0.030)	(0.030)
NonPoorParticipant	0.017	0.098***	0.064*	0.070**	-0.001	0.041*	0.021	0.010
	(0.015)	(0.022)	(0.034)	(0.035)	(0.040)	(0.021)	(0.030)	(0.028)
NonPoorNonParticipant	0.048***	0.219***	0.077**	0.090**	0.006	0.026	-0.000	0.028
	(0.015)	(0.025)	(0.033)	(0.036)	(0.040)	(0.021)	(0.028)	(0.032)
Student Char	Y	Y	Y	Y	Y	Y	Y	Y
Student FE	Y	Y	Y	Y	Y	Y	Y	Y
Grade FE	Y	Y	Y	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
No Students	40,529	40,529	37,307	37,455	34,346	38,769	38,858	38,740
No Schools	588	588	556	555	550	563	561	562
Observations	81,125	81,125	74,679	74,973	68,743	77,603	77,782	77,546
R-squared	0.803	0.871	0.642	0.656	0.648	0.603	0.629	0.628

Notes: Robust standard errors in parentheses clustered by school (*p < .10; **p<.05; ***p<.01 Sample includes observations of Ever UFM/POS students in 6th to 12th grade with at least two years of data, whose middle or high school poverty status is observed in a nonUFM year from 2010-2017. Sample uses last year's poverty and participation status in the prior, non-UFM year. Models in columns 3-8 control for cohort-specific linear time trends. Student characteristics include indicators for SWD and ELL. Sample includes ~26,400 (65 percent) PoorParticipants, ~3,300 (8 percent) PoorNonParticipants, ~6,100 (15 percent) NonPoorParticipants, and ~4,600 (12 percent) NonPoorNonParticipants. Point estimates by participant and poverty are all statistically different from each other at the 1 percent level for both SBP and SLP. Point estimates by participant and poverty are not statistically different from each other for bullying, fighting, and safety in the classroom, with the exception of classroom safety for PoorParticipants and NonPoorNonParticipants.

Table 7 – Panel A: Regression Results, New UFM Exposure for Students, 2012-2016

	UFM Next Year
Respect	-0.006
	(0.004)
Bullying	-0.001
	(0.004)
Safe: Class	-0.001
	(0.004)
Safe: Inside	-0.007*
	(0.004)
Safe: Outside	-0.001
	(0.004)
Fighting	-0.002
	(0.004)
Clean	-0.001
	(0.003)
ELL	0.004
	(0.011)
Poor	0.009
	(0.007)
POS	0.014
	(0.011)
Principal Change	0.013
	(0.010)
2 Principals	0.003
	(0.017)
Principal Change Next Year	-0.001
	(0.009)
Student FE	Y
Year FE	Y
Grade FE	Y
School FE	Y
No Students	95,471
No Schools	729
Observations	148,748
R-squared	0.956

Notes: Robust standard errors in parentheses clustered by school (*p < .10; **p<.05; ***p<.01). Sample includes observations of Ever UFM students in 6th to 12th grade with at least two years of data who are not exposed to UFM in the current year from 2012-2016 (2017 observations excluded as UFM status in t+1 is not observed).

Table 7 – Panel B: Regression Results, New UFM Adoption for Schools, 2010-2016

	UFM Next Year
Respect	-0.021
	(0.024)
Bullying	0.022
	(0.026)
Safe: Class	0.001
	(0.005)
Safe: Inside	-0.013
	(0.016)
Safe: Outside	-0.001
	(0.004)
Fighting	-0.019
	(0.022)
Clean	-0.000
	(0.004)
% ELL	0.003
	(0.005)
% Poor	-0.016
	(0.019)
% Black	-0.008
	(0.019)
% Hispanic	0.011
	(0.022)
% White	0.000
	(0.018)
% Asian	0.011
	(0.021)
POS	0.001
	(0.002)
Principal Change	0.004
	(0.005)
2 Principals	0.001
	(0.003)
Principal Change Next Year	0.001
	(0.002)
No Schools	260
Observations	954
R-squared	0.996

Notes**:** Robust standard errors in parentheses clustered by school (*p < .10; **p<.05; ***p<.01). Includes school and year fixed effects. Sample includes observations of Ever UFM schools serving 6th to 12th grade students with at least two years of data who are not exposed to UFM in the current year from 2010-2016 (2017 observations excluded as UFM status in t+1 is not observed).

VII. Appendix

Table A1. Differential Effects of UFM Adoption over Time, School Level, 2011-2017

	(1) Bullying	(2) Fighting	(3) Respect	(4) Safe: Class	(5) Safe: Inside	(6) Safe: Outside
UFM						
Year 1	0.021*	0.053***	-0.010	0.028**	0.030**	0.023*
	(0.012)	(0.016)	(0.017)	(0.011)	(0.012)	(0.012)
Year 2	0.009	0.038**	-0.027	0.031***	0.044***	0.043***
	(0.012)	(0.016)	(0.018)	(0.012)	(0.013)	(0.015)
Year 3+	0.001	0.037*	-0.040*	0.026	0.035**	0.036*
	(0.018)	(0.021)	(0.024)	(0.018)	(0.017)	(0.019)
Student Char	Y	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
No Schools	272	272	272	272	272	272
Observations	1,899	1,899	1,901	1,901	1,900	1,900
R-squared	0.659	0.691	0.600	0.450	0.539	0.546

Notes: Robust standard errors in parentheses clustered by school (*p < .10; **p<.05; ***p<.01). Sample includes ever UFM schools from 2010-2017 that adopted UFM for the first time between 2011 and 2017, and responses are aggregated from 6th – 12th grade Ever UFM students whose poverty status is observed in a nonUFM year. Student characteristics include percent SWD, ELL, Black, Hispanic, White, and Asian. In this sample, 272 schools are used to estimate Year1 estimates, 270 schools are used to estimate Year2 effects, and 258 schools are used to identify Year 3+ effects.

Table A2. Differential Effects of UFM over Time, Student-Level, 2013-2017

	(1) Bullying	(2) Fighting	(3) Respect	(4) Safe: Class	(5) Safe: Inside	(6) Safe: Outside
UFM						
Year 1	0.012	0.019	0.003	-0.004	0.005	0.019
	(0.012)	(0.018)	(0.014)	(0.010)	(0.013)	(0.012)
Year 2	-0.000	0.005	-0.001	-0.014	-0.010	0.012
	(0.015)	(0.019)	(0.020)	(0.011)	(0.015)	(0.014)
Year 3+	0.004	0.001	0.002	-0.009	-0.012	0.008
	(0.020)	(0.024)	(0.022)	(0.013)	(0.016)	(0.016)
Student Char	Y	Y	Y	Y	Y	Y
Student FE	Y	Y	Y	Y	Y	Y
Grade FE	Y	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
No Students	64,842	64,799	62,876	65,270	65,365	65,327
No Schools	848	847	843	849	845	847
Observations	217,986	217,863	205,259	221,631	222,083	221,725
R-squared	0.472	0.501	0.503	0.419	0.452	0.458

Notes: Robust standard errors in parentheses clustered by school (*p < .10; **p<.05; ***p<.01). Sample includes Ever UFM/POS students in 6th to 12th grade with at least two years of data, whose middle or high school poverty status is observed in a nonUFM year from 2010-2017. Student characteristics include indicators for SWD and ELL. Models control for cohort-specific linear time trends. 57,864 students contribute to the Year 1 estimate, 37,335 students contribute to Year 2, and 16,494 contribute to the third year and beyond. Over half the sample is exposed to UFM in middle schools in 2015, but these students lose UFM once they move to high school. Therefore, the number of students contributing to the 3rd year and beyond effects is vanishingly small. In addition, 57,000 students are used to estimate Year 1 effects instead of 62,000 because their first year of exposure is not observed.

Table A3: The Effect of UFM on Meal Participation and Student Perceptions, Excluding Ever-Retained Students, 2013-2017

	(1) SBP	(2) SLP	(3) Bullying	(4) Fighting	(5) Respect	(6) Safe: Class	(7) Safe: Inside	(8) Safe: Outside
UFM	-0.001	0.022	0.021*	0.029*	0.005	0.001	0.018	0.025**
	(0.016)	(0.016)	(0.011)	(0.017)	(0.014)	(0.010)	(0.013)	(0.012)
Student Char	Y	Y	Y	Y	Y	Y	Y	Y
Student FE	Y	Y	Y	Y	Y	Y	Y	Y
Grade FE	Y	Y	Y	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
No Students	96,457	96,457	94,099	93,947	89,909	94,773	94,947	94,857
No Schools	860	860	858	857	852	857	856	858
Observations	305,251	305,251	292,411	292,040	273,283	296,908	297,544	297,030
R-squared	0.646	0.740	0.491	0.519	0.526	0.440	0.473	0.484

Notes: Robust standard errors in parentheses clustered by school (*p < .10; **p<.05; ***p<.01). Sample includes observations of Ever UFM/POS students in 6th to 12th grade with at least two years of data, whose middle or high school poverty status is observed in a nonUFM year from 2010-2017 and who are never retained between 2009 and 2017. Models control for cohort-specific linear time trends. This removes approximately 6 percent of students from the sample. Student characteristics include indicators for SWD and ELL.

Table A4 – Panel A: The Effect of UFM on Meal Participation and Student Perceptions, 2013-2017 – Movement from "Worst" to Anything Better

	(1)	(2)	(3)	(4)	(5) Safe: Inside	(6) Safe: Outside
	Bullying	Fighting	Respect	Safe: Class		
UFM	0.008	0.006	0.002	0.004	0.006	0.008
	(0.008)	(0.011)	(0.009)	(0.005)	(0.008)	(0.007)
Student Char	Y	Y	Y	Y	Y	Y
Student FE	Y	Y	Y	Y	Y	Y
Grade FE	Y	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
No Students	100,109	99,947	95,647	100,847	101,034	100,927
No Schools	863	863	861	863	862	864
Observations	310,875	310,507	290,502	315,743	316,418	315,863
R-squared	0.489	0.517	0.525	0.440	0.472	0.483

Panel B: Movement from Anything Worse to "Best"

	(1)	(2)	(3)	(4)	(5) Safe: Inside	(6) Safe: Outside
	Bullying	Fighting	Respect	Safe: Class		
UFM	0.014	0.034**	0.013	0.049***	0.038***	0.026*
	(0.011)	(0.015)	(0.011)	(0.014)	(0.013)	(0.015)
Student Char	Y	Y	Y	Y	Y	Y
Student FE	Y	Y	Y	Y	Y	Y
Grade FE	Y	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
No Students	100,109	99,947	95,647	100,847	101,034	100,927
No Schools	863	863	861	863	862	864
Observations	310,875	310,507	290,502	315,743	316,418	315,863
R-squared	0.489	0.517	0.525	0.440	0.472	0.483

Notes: Robust standard errors in parentheses clustered by school (*p < .10; **p<.05; ***p<.01). Sample includes observations of Ever UFM/POS students in 6th to 12th grade with at least two years of data, whose middle or high school poverty status is observed in a nonUFM year from 2010-2017. Student characteristics include indicators for SWD and ELL. Models control for cohort-specific linear time trends. Responses are binary indicators in which the best possible answer equals 1 and 0 otherwise.

Table A5. Characteristics of Students Answering vs. "I Don't Know," 2015-2017

	Respect	
	Answered	"I Don't Know"
Female	51.8	48.1
White	15.0	12.0
Black	21.7	21.6
Hispanic	40.8	45.3
Asian	21.4	20.0
Other Language	50.9	54.5
ELL	8.9	11.7
SWD	11.9	14.2
Mean No. Obs.	4.1	4.0
Mean Grade	8.9	8.8
SBP	9.2	9.4
SLP	34.7	36.2
No. Students	209,921	19,819

Table A6. The Effects of UFM Coding "I Don't Know" as Neutral (.5), 2013-2017

	(1) Respect
UFM	0.003
	(0.013)
Student Char	Y
Student FE	Y
Grade FE	Y
School FE	Y
Year FE	Y
No Students	101,067
No Schools	866
Observations	315,208
R-squared	0.508

Notes: Robust standard errors in parentheses clustered by school (*p < .10; **p<.05; ***p<.01). Sample includes observations of Ever UFM/POS students in 6th to 12th grade with at least two years of data, whose middle or high school poverty status is observed in a nonUFM year from 2010-2017. Always UFM (2010-2017) students are excluded from this analysis. Models control for cohort-specific linear time trends. Student characteristics include indicators for SWD and ELL.

Table A7. Chronbach's Alpha Analysis, 2010-2017

Item	Observation	Sign	Item-test correlation	Item-rest correlation	Average inter item covariance	Alpha
Bullying	441,085	+	0.70	0.54	0.31	0.76
Fighting	441,196	+	0.69	0.53	0.31	0.77
Respect	445,450	+	0.66	0.44	0.31	0.79
Safe: Class	446,592	+	0.70	0.57	0.32	0.76
Safe: Inside	447,197	+	0.77	0.65	0.29	0.74
Safe: Outside	446,468	+	0.74	0.59	0.30	0.75
Test Scale					0.31	0.79

Table A8. Factor Analysis, 2010-2017

Factor	Variance	Difference	Proportion	Cumulative
Factor1	2.30	0.47	0.38	0.38
Factor2	1.83	.	0.31	0.69

Variable	Factor1	Factor2	Uniqueness
Bullying	0.19	0.85	0.24
Fighting	0.17	0.85	0.24
Respect	0.35	0.52	0.61
Safe: Class	0.84	0.14	0.27
Safe: Inside	0.87	0.21	0.20
Safe: Outside	0.81	0.21	0.30

	Factor1	Factor2
Factor1	0.79	0.62
Factor2	-0.62	0.79

Table A9. The Effects of UFM on Perceptions Using Indexed Student Perceptions, 2013-2017

	(1) Safety Factor 1	(2) Peer Factor 2	(3) Safety Factor 1	(4) Peer Factor 2	(5) Safety Factor 1	(6) Peer Factor 2
UFM	0.049* (0.027)	0.057* (0.033)				
UFM*Always Poor			0.051* (0.027)	0.052 (0.034)		
UFM*Sometimes Poor			0.057* (0.030)	0.067* (0.036)		
UFM*Never Poor			0.041 (0.028)	0.063* (0.034)		
UFM*Participant					0.068** (0.033)	0.103** (0.043)
UFM*NonParticipant					0.070** (0.036)	0.120*** (0.046)
Student Char	Y	Y	Y	Y	Y	Y
Student FE	Y	Y	Y	Y	Y	Y
Grade FE	Y	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
No Students	100,062	92,806	100,062	92,806	70,490	63,778
No Schools	861	857	861	857	785	774
Observations	311,319	277,846	311,319	277,846	191,827	168,751
R-squared	0.521	0.593	0.521	0.593	0.564	0.634

Notes: Robust standard errors in parentheses clustered by school (*p < .10; **p<.05; ***p<.01). Sample includes observations of Ever UFM/POS students in 6th to 12th grade with at least two years of data, whose middle or high school poverty status is observed in a nonUFM year from 2010-2017 and who answered all three questions required for each factor. Safety Factor 1 is an index of binary safety responses and Peer Factor 2 is an index of binary bullying, fighting, and respect responses. Student characteristics include indicators for SWD and ELL. All models control for cohort-specific linear time trends. Models in columns 3 and 4: ~62,700 AlwaysPoor, ~10,600 Sometimes Poor, and ~14,000 NeverPoor. Models in columns 5 and 6 use last year's participation status and therefore loses one year from the sample ~51,800 Participants and ~13,900 Non-Participants.

Table A10: The Effects of UFM on Meal Participation and Student Perceptions by School Level, 2013-2017

	(1) SBP	(2) SLP	(3) Bullying	(4) Fighting	(5) Respect	(6) Safe: Class	(7) Safe: Inside	(8) Safe: Outside
UFM								
Middle	-0.003	0.016	0.026**	0.033*	-0.002	0.003	0.019	0.023**
	(0.016)	(0.016)	(0.011)	(0.017)	(0.014)	(0.010)	(0.012)	(0.012)
High	0.015	0.149***	-0.017	0.050	0.005	0.037	0.038*	0.013
	(0.018)	(0.053)	(0.028)	(0.061)	(0.066)	(0.023)	(0.021)	(0.024)
Student Char	Y	Y	Y	Y	Y	Y	Y	Y
Student FE	Y	Y	Y	Y	Y	Y	Y	Y
Grade FE	Y	Y	Y	Y	Y	Y	Y	Y
School FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
No Students	102,895	102,895	100,109	99,947	95,647	100,847	101,034	100,927
No Schools	867	867	863	863	861	863	862	864
Observations	325,334	325,334	310,875	310,507	290,502	315,743	316,418	315,863
R-squared	0.646	0.739	0.489	0.517	0.525	0.440	0.472	0.483

Notes: Robust standard errors in parentheses clustered by school (*p < .10; **p<.05; ***p<.01). Sample includes observations of Ever UFM/POS students in 6th to 12th grade with at least two years of data, whose middle or high school poverty status is observed in a nonUFM year from 2010-2017. Models in columns 3-8 control for cohort-specific linear time trends. Student characteristics include indicators for SWD and ELL. Middle refers to students in grades 6-8, and high refers to students in grades 9-12.

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