The Effect of the National School Lunch Program on Educational Attainment

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I. ABSTRACT

This paper estimates the effect of youth participating in the National School Lunch Program (NSLP) on graduation rates in schools across the United States in 2010, with supporting evidence from years 2000 and 2005. Most existing literature and research on the NSLP focus on the relationship between meal program participation and the associated health effects, such as reductions in obesity rates. However, this paper focuses its analysis on the educational outcomes that can be attributed to the program, since child health and nutrition are strongly associated with positive growth, development and cognition effects. This study finds that the effect of participation in the program on graduation rates is always positive and has gotten stronger over the ten-year interval in focus. However, a diminishing effect is observed. These results may suggest that while improving nutrition matter and NSLP lunches facilitate improved academic performance, relying on schools to provide too many meals for students may have a detrimental effect on student achievement.[1]

JEL CODES: C10, I18, I21

KEYWORDS: National School Lunch Program, educational attainment, graduation rates, nutrition, econometrics

II. INTRODUCTION

The National School Lunch Program (NSLP) is the one of the largest food and nutrition assistance programs in the United States and serves more than 31 million students daily. It is a federally funded program overseen by Food and Nutrition Service (FNS) of the United States Department of Agriculture (USDA). It operates in over 100,000 public and non-profit private schools and residential child care institutions. The purpose of the NSLP is to provide universal access to nutritionally balanced meals to children.

Any child attending a participating school may eat a meal through the NSLP, but what a student pays depends on family income. Children from families with incomes at or below 130% of the poverty level are eligible for free meals. To be eligible for reduced price meals, family income must be between 130-185% of the poverty level. In 2000, roughly 57% of participants received free or reduced price meals, and this increased to 65% in 2010. Children from families with incomes over 185% of the poverty level pay charges for meals, set by local school food authorities. Schools receive a small federal reimbursement for these lunches, but the meal services must still operate as a non-profit program. See the Appendix for additional statistics regarding meals served from years 2000-2010.

The NSLP's opt-in structure requires school districts to file an application to participate in the program. Districts have numerous incentives to participate in the program. First, participating school districts receive cash subsidies and foods from the USDA for each meal served. To receive the cash subsidies, the school districts must meet the federal nutritional policy requirements and offer free or reduced price lunches to eligible children. Second, many higher-poverty school districts need the program in order to feed their students. Since recession started in the 2007-2008 school year, the proportion of children eligible for free or reduced price meals

increased significantly and the number of children able to buy paid meals decreased (Food Research and Action Center, 2015). Without the NSLP, many students are unable to afford lunch and this in turn negatively impacts schools from attaining optimal performance in the classroom. Third, for convenience purposes, it is often more efficient for a district to operate one food program as opposed to individual schools in the district operating different food service programs.

School districts have alternative options to feed students too. Alternative options include selling a la carte items in the cafeteria, utilizing a private company to provide meals, providing access to vending machines or a school store, and allowing students to leave campus during lunch. These alternatives could enable school districts to make a profit, control prices and avoid less nutritional requirements. While these options may be cost saving, they could result in less healthy food choices for students. Also, opting out of the program comes at the opportunity cost of districts losing federal funding that covers the cost of free and reduced-price meals for low-income students.

Since the NSLP is an opt-in system and schools have alternative options for serving lunches, this paper investigates one of the benefits that educational institutions may receive from participating in the NSLP. Specifically, this research analyzes the effect of the NSLP on educational attainment measured by high school graduation rates in 2010, with supporting evidence from years 2000 and 2005. Using an education production function as a guide, I utilize a multiple-year regression strategy to exhibit the same variables' effect on graduation rates over a ten-year interval. To preview the results, my regression analysis suggests that participating in the NSLP has a positive but diminishing impact on graduation rates, and the impact has become stronger over time.

III. LITERATURE REVIEW: NUTRITION AND EDUCATIONAL ATTAINMENT

Past research confirms a positive relationship between a balanced nutrient intake and cognitive capabilities. Growdon and Wurtman (1980) argued that the brain should no longer be viewed as organ independent of metabolic processes elsewhere in the body, but that it is affected by recent meals. Neurotransmitters are made from the foods high in protein and promote chemical messaging in the brain. Without neurotransmitters, brain activity level is lower and people become lethargic, passive and withdrawn. Erickson's (2006) research noted that additional food elements are key for an appropriate level of brain functioning too. For example, carbohydrates' breakdown into glucose give the brain energy and certain fats, such as Omega-3, increase both memory and mood by keeping the brain well nourished.

An unhealthy diet can negatively impact cognition, which has an adverse effect on academic performance. Li & O'Connell (2012) examined fifth-graders' relationship between self-reported high calorie intake and academic achievement. Results showed a negative relationship between fast food eating frequency with math and reading scores. Tobin (2013) found that a higher than average fast-food consumption was significantly associated with lower test scores, while controlling for teacher experience, school poverty level and school urban-rural location.[2] Feinstein and Sorhaindo (2006) found unhealthy diet leads to physical development and motor control deficiencies, attention, and coordination problems, reduced student school success and lowered academic performance.[3] Lower math test scores were observed among students with iron deficiencies. They were twice as likely to score below average on math tests.

Although research on school meal programs' impact on educational performance is limited, the existing literature reports a positive relationship. Hinrichs (2010), based on program participation from 1941 to 1956, found a significant positive relationship between NSLP
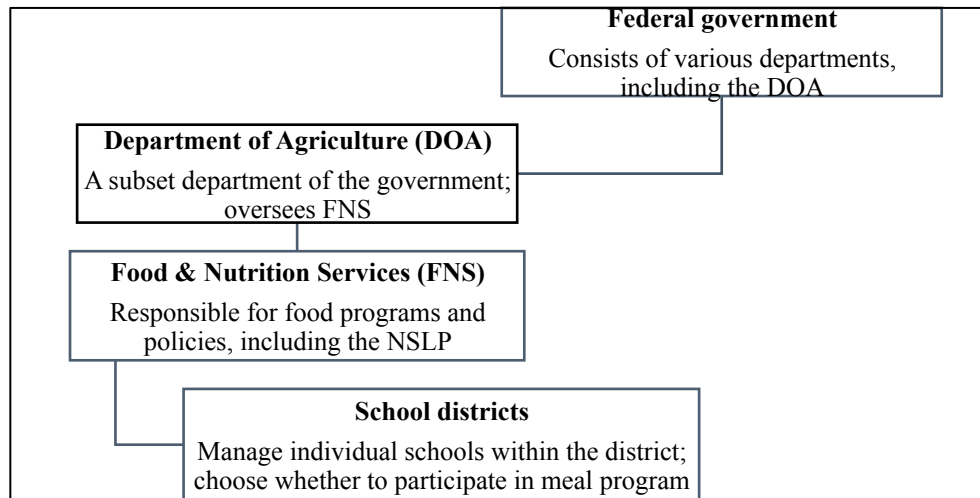
participation and years of educational attainment. A 10% increase in NSLP meals served resulted in an average increase of 0.365 years in education for women and nearly a year increase for men. Hinrichs also found that the program's positive health effects dissipate over time, but facilitate higher educational attainment. Chef Jamie Oliver's "Feed Me Better" campaign in the United Kingdom introduced healthier school meals in Greenwich. Belot and James (2009) analyzed the effect of Oliver's campaign on the percentage of students who reached higher Attainment Levels in schools. The Attainment Levels range from 1-5, with 1 being the lowest and the highest performing students are awarded a level 5. They found an increase of up to 6% for students who reached level 4 in English and up to 8% for students who reached level 5 in science.

IV. ECONOMIC THEORY

Each year school districts allocate funds for educational inputs, including meal program expenses. Nutritional meal requirements are set at the federal level, and the USDA administers reimbursements for schools that opt-in to the NSLP and follow the federal requirements. Districts that opt-out of the NSLP or ones that do not meet the meal program requirements incur costs for providing meals, often causing school districts to take food program policies as given.

Figure 1 below illustrates the relationship between the various organizations involved with the NSLP participation choice.

Figure 1: NSLP Organization Relationships

Federal government
Consists of various departments, including the DOA

Department of Agriculture (DOA)
A subset department of the government; oversees FNS

Food & Nutrition Services (FNS)
Responsible for food programs and policies, including the NSLP

School districts
Manage individual schools within the district; choose whether to participate in meal program

Given a school district's objective to maximize educational output, a production function can be expressed as:

$$E = f(A, H, R, L, P) \tag{1}$$

Educational output (E) depends on students' attributes (A), home environment (H), school resources (R), school location (L), and peer group attributes (P).

Student attributes are what students bring to the school and classroom that are independent of school effort. For example, individual motivation, genetic condition, dedication and congenital health problems are not determined by the school.

Parents establish home environments that affect educational outcomes by monitoring time use, promoting educational enrichments and being supportive (O'Sullivan, 2012). Healthy child-parent relationships include positive reinforcement, nightly family dinners, parent-child bonding activities, in addition to parental support and attendance at the child's extracurricular activities. Parental choices and the home environment also influence a student's nutrition and health inputs. Parents often choose the foods served at home, as they are typically the decision

makers for children. When parents foster and encourage a healthy lifestyle for children, the likelihood of raising educational attainment levels increases, independent of school effort.

Home environment is a function, at least in part, of the education and income levels of the parents. The higher the income and the more education parents have, the more effective the home support system will likely be. Low income and education can increase risk of malnutrition, poor health, less time with parents, and unstable neighborhood conditions are examples which may reduce student achievement.

Teacher quality can have a significant impact on educational outcomes. Measures of teacher quality are education, ability, experience, communication skills and certification. Higher quality teachers can inspire and motivate students to succeed in school and present more challenging material to increase students' cognitive and critical thinking capabilities.[4]

An important choice a school makes is the allocation of resources to its nutrition program. Free or reduced price meals can provide students with access to nutritious meals, a resource students may be unable to receive at home.

School districts' education choices are subject to constraints. School districts have an operating budget that cannot be overspent. With a limited budget, schools must make allocation decisions each academic year that limit the optimal amount of some inputs. Second, there are state or federal level policy constraints that school districts must follow. For example, school districts must follow minimum wage laws, physical education time requirements, and perhaps, nutrition requirements for meals served. Last, the quality and quantity of both students and teachers can be a limitation to school districts.

V. EMPIRICAL MODEL AND RESULTS

High school graduation rates from public schools, the dependent variable, is a measure of educational attainment.[5] Educational attainment is a broad phrase that describes accomplishments that students have achieved. Although educational attainment is not directly observable, a state's graduation rates can serve as its proxy. Observations for this empirical work come from the 46 states with complete data.[6]

The empirical model to be tested is:

$$grad_i = \beta_{0i} + \beta_1 nslp_i + \beta_2 nslp^2{}_i + \beta_3 obes\_rank_i + \beta_4 c\_poverty_i + \beta_5 crime_i + \beta_6 m\_teachers_i + \beta_7 sat_i + \beta_8 ptratio_i + \beta_9 inexper\_rank_i \tag{2}$$

Variable definitions and descriptive statistics for the dependent and independent variables are presented in Table 1. The state poverty level (*C_POVERTY)* and crime rate (*CRIME)* capture elements of the student's home and neighborhood environments. A state's obesity ranking (*OBES_RANK)* provides insight to home environment, since there has historically been a positive correlation between obesity and poverty and parents are responsible for foods served at home (Levine, 2011). Teacher quality is proxied by how many pupils teachers have on average (*PTRATIO)* and the state's ranking of percentage of novice teachers relative to other states (*INEXPER_RANK*). The percentage of male teachers per state (*M_TEACHERS*) is also meant to control for teacher effectiveness. A student's SAT score (*SAT*) controls for both teacher quality and student attributes.

The National School Lunch Program (*NSLP*) variable measures the number of program meals served in the state per student – rather than total meals served – during the school year to adjust for state size differences. This measure includes all meals, not solely the reduced price and free meals, which have been served during the nine months of an academic year. This variable represents a choice of resources offered by the school districts to all students and will provide the

test for the importance of a healthy and nutritious diet on educational achievement. The $NSLP^2$

variable is $NSLP$ term squared. It is included to test for a diminishing marginal effect of the meal

program.

Table 1: 2010 Education Production Function Variable Definitions and Statistics

Variable	Definition	Mean	Standard Deviation
GRAD	The percentage of high school graduates in the state	74.98	6.29
NSLP	National School Lunch Program (NSLP) meals served per student in the state annually	107.38	18.18
$NSLP^2$	Quadratic term for the NSLP variable	11,854.53	3,953.62
OBES_RANK	The state's obesity ranking 1 = the state with the highest percent of obese residents 46 = the state with the lowest percent of obese residents	23	13.42
C_POVERTY	Percent of children (under 18) who live in families with incomes below the federal poverty level	20.24	5.14
CRIME	The state's violent crime rate per 100,000 inhabitants[7]	365.59	142.51
M_TEACHERS	The percent of teachers in the state who are male	24.51	3.72
SAT	The state's average total SAT score	1,596.46	116.70
PTRATIO	The state's average pupil-teacher ratio	15.16	2.58
INEXPER_RANK	The state's ranking of teachers with less than 3 years of full-time teaching experience 1 = the state with the highest percent of inexperienced teachers 46 = the state with the lowest percent of inexperienced teachers	23	13.42

Table 2 presents the results of the regression results for 2000, 2005, and 2010.[8] T-statistics are listed in parentheses. Specific interpretation of results in the paragraphs below mainly refer to year 2010, with years 2000 and 2005 used as supporting evidence.

Table 2: Education Production Function Results (2000, 2005, 2010): Dependent Variable *GRAD*

Variable	2000	2005	2010
Constant	7.93	26.59	40.70
	(0.26)	(1.00)	(1.85)
NSLP	0.51	0.64***	0.77**
	(1.16)	(1.70)	(2.30)
NSLP²	-0.0028	-0.0036**	-0.0036**
	(-1.26)	(-2.06)	(-2.37)
OBES_RANK	0.0084	-0.16***	-0.10
	(0.10)	(-1.93)	(-1.59)
C_POVERTY	-0.28	-0.39***	-0.61*
	(-1.09)	(-1.83)	(-3.50)
CRIME	-0.01***	-0.02*	-0.01*
	(-1.78)	(-4.17)	(-2.93)
M_TEACHERS	0.46***	0.40	0.43**
	(1.86)	(1.34)	(2.30)
SAT	0.04**	0.02*	0.01**
	(2.39)	(2.95)	(2.10)
PTRATIO	-0.68	-0.51	-0.79*
	(-1.26)	(-1.36)	(-3.17)
INEXPER_RANK	0.06	-0.05	-0.09***
	(0.70)	(-0.59)	(-1.70)
R^2	0.5878	0.6707	0.7253

* Significant at the 1% level
** Significant at the 5% level
*** Significant at the 10% level

While insignificant, *OBES_RANK* carries the expected negative coefficient sign, supporting past results that reported the negative impacts of poor diet on cognitive abilities and school performance. The insignificance is due to multicollineraity, as *OBES_RANK* has a -0.62 and -0.65 correlation coefficient with *NSLP* and *C_POVERTY* respectively.

The significant negative signs on *C_POVERTY* and *CRIME* are as expected. This finding echoes past literature and findings (Farrington, Roderick, Allensworth, Nagaoka, Keyes, Johnson, and Beechum 2012) highlighting the negative effect of lower levels socio-economic status on educational attainment. Children who grow up in households with better socio-economic conditions are more likely to graduate from high school. Higher crime rates reduce educational attainment, as students may be less focused on academics due to the distractions of or involvement with crime related activity in the surrounding neighborhood.

The positive and significant estimate on *M_TEACHERS* shows that with an additional percentage of male teachers in the state, graduation rates increase. As male teachers currently make up a less than a quarter of all teachers in the United States, additional presence of male teachers could be more effective than female teachers up to a certain point. This theory makes sense, given that the breakdown of female-male students in the nation is roughly balanced to a 50:50 ratio (Davis and Bauman, 2013). Male teachers may help some students work through personal issues or life events and may provide alternative role models.

SAT is significant and positive, showing that students with a higher SAT score are more likely to graduate. Although an often-debated topic, the SAT has been argued to proxy high performing academic students and predict success. According to this argument, the coefficient on *SAT* makes sense. Higher SAT scores represent the states with stronger students, thus higher graduation rates.

The negative and significant sign on *PTRATIO* shows that having more students per teacher decrease graduation rates. Given that a lower pupil-teacher ratio enables teachers to provide more time and attention per student, this finding is as expected. A lower pupil-teacher

ratio allows one's teaching style to be more individualized and tailored toward students' needs, providing a more conducive environment to learning and success in the classroom.

INEXPER_RANK's negative and significant result reiterates existing research's (Fetler, 2001 and Rivkin, Hanushek, and Kain 2005) emphasis on the relation between novice teachers and student achievement. The more novice teachers there are in a state, lower graduation rates are likely to be attained. This finding highlights the importance of teacher development through experience and time in the classroom. On average, teachers with some experience are more effective than brand new teachers (Kane, Rockoff, and Staiger, 2008).

VI. THE IMPACT OF THE LUNCH PROGRAM ON EDUCATIONAL ATTAINMENT

The regression results for 2000, 2005, and 2010 provide evidence that participating in the lunch program helps schools increase educational output. This finding confirms past research regarding the positive effect of healthy meals on educational attainment (Hinrichs 2010, Belot and James 2009). The coefficient on the *NSLP* variable is significant for years 2010 and 2005, but not year 2000. The coefficients in all years are positive and the size of the coefficients increase over this period. As the number of meals served per student increases by one meal yearly, the graduation rate is expected to increase by 0.51, 0.64, and 0.77 percentage points for years 2000, 2005, and 2010 respectively.

While providing nutritious meals has a positive effect on educational attainment, the negative coefficient of $NSLP^2$ during all three years implies a diminishing marginal effect. Similar to the *NSLP* results, years 2005 and 2010 show the squared term as being significant, while the coefficient in 2000 is insignificant.
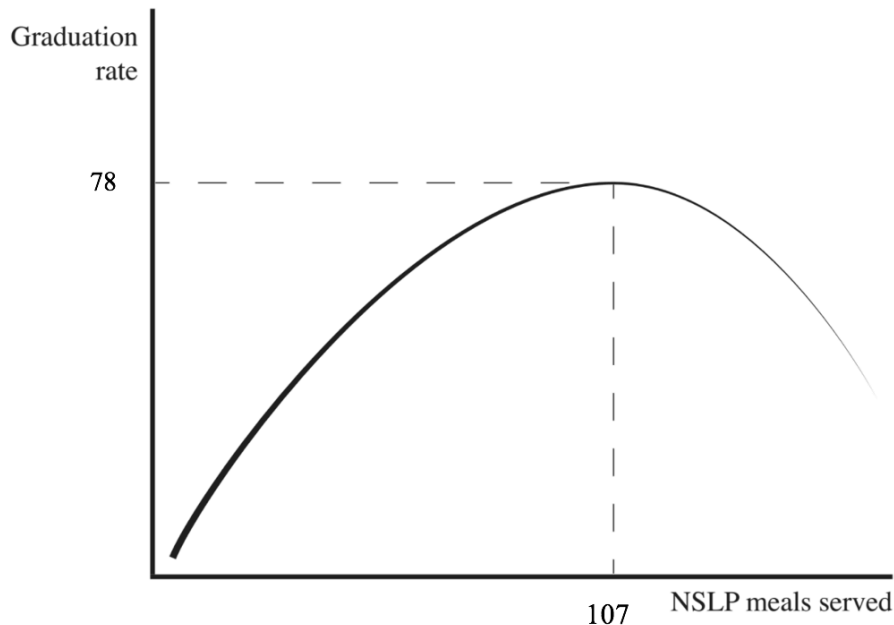
A theoretical explanation regarding why *NSLP* and $NSLP^2$ are only significant in years 2005 and 2010 is due to the policy changes regarding the NSLP directly prior to these years. A

main driver of policy change started with the 2004 Child Nutrition and WIC Reauthorization Act, which amended the Richard B. Russell National School Lunch Act (NSLA) and the Child Nutrition Act of 1966 (CNA) to provide children with increased access to nutrition assistance and food, simplify program operations, improve management and reauthorize child nutrition programs. This policy remained in effect through most of 2010, then Michelle Obama's Healthy, Hunger-Free Kids Act of 2010 was enacted at year-end to increase the meal reimbursement rate, nutritional standards and the number of program-eligible children. These policy changes caused more focus to be put on the effectiveness of the program nationally. These were the first changes to the NSLA standards since they were established in 1966. This increased attention and program changes could explain the increasing significance of the *NSLP* variable in years 2005 and 2010. Furthermore, the statistical reason regarding the *NSLP* insignificance in year 2000 is related to the presence of high multicollinearity in the model.[9]

Based on the 2010 results from the estimated equation and using the mean value for the independent variables yields:

$$grad\ = 37.63 + 0.77nslp - 0.0036nslp^2 \tag{3}$$

In each of the regression models for 2000, 2005, and 2010, the diminishing returns to resources devoted to nutrition occurs. Based on equation (3), *NSLP* has a positive effect on *GRAD* when *NSLP* is less than 107. The marginal effect on *GRAD* for *NSLP* becomes zero when 107 meals are served per student per year. After that, increasing lunches served reduces the graduation rate. (For years 2000 and 2005, the turnaround point of *NSLP* is 92 and 88 meals respectively.) Figure 2 below shows the relationship between graduation rates and meals served for 2010.

Figure 2: The Relationship between *GRAD* and *NSLP* (2010)

The negative effect might not be relevant if zero states served more than 107 meals per

student yearly. However, 25 states served more than 107 meals per student yearly in 2010, which

is too large an amount to ignore. The result that serving more meals can stop being beneficial for

increasing educational attainment is something that school districts should consider.

Two theories can help explain why at some point, schools that serve more meals

experience a decline in student achievement. First, serving additional meals takes away from

other resources schools use to provide a quality educational experience. Although the

government sponsors the NSLP, there are other expenses that school districts would have to

absorb out of their budget when meals are served. For example, the school district must hire

more cafeteria staff, in addition to purchasing more equipment (e.g. plates and utensils) and

machinery (e.g. ovens, stoves, and refrigerators) to sustain the growth in meals served. As school

districts have a limited budget, more resource allocation to the lunch program may come at the expense of providing other school inputs (ones with relatively higher marginal products) such as hiring quality teachers, enhancing technology and expanding classroom or physical education facilities.

A second argument is that increases to the number of lunches served may indicate that the district has more students from low socio-economic households. This is supported by a correlation co-efficient of 0.44 between *C_POVERTY* and *NSLP* in the model. The NSLP most directly helps lower-income, distressed students, as they may not be receiving the recommended nutritional content in their home environment. As discussed above, students from lower socio-economic householders have fewer home, student and neighborhood resources to support educational attainment.

Although there are diminishing marginal returns, it still may be necessary for schools to partake in this program to maintain nutrition and serve a greater non-educational function. For instance, if students are in need of additional food (beyond the 107 meals served per year), they would be burdened to get additional meals from alternative sources such as food banks or social service agencies. Despite the eventual negative impact of the program, serving meals at school can fulfil non-educational purposes.

VII. CONCLUSION

The empirical results show that the NSLP has a positive, increasing over time impact on graduation rates and gives students access to better levels of nutrition across years. Improved access to better nutrition positively impacts the growth and development of children. When schools participate in the NSLP, graduation rates increase up to a point, then a diminishing effect is observed. This finding shows that improving nutrition matters, but relying on schools to

provide too much in terms of meals per student per year may have a detrimental effect on student achievement as observed across all years tested.

Public policy must find the balance so children can easily attain affordable, healthy meals at school while not requiring schools to misallocate resources to meal provision. There have been cases of unintentional meal program participation decreases due to the high costs of complying with the new standards noted in the Healthy Hunger-Free Kids Act. For example, some school districts switched to fresh produce from canned foods increasing shipment frequency and the labor time necessary to unload and prepare foods. Since 2012, over 300 school districts have opted out of the meal program altogether, and the increased standards and cost were undoubtedly factors (Harrington, 2014).

It should be noted that causal relationships should not be inferred from the studies conducted in this paper. Rather, the regression results suggest that perhaps there is a relationship between the NSLP and educational attainment. Specifically, increasing the requirements of the NSLP and dealing with the issues of hunger in school have become increasingly more important for statewide graduation rates.

VIII. FURTHER RESEARCH

There are multiple ways that research on the effect of the NSLP on educational attainment can be enhanced. First, it would be valuable to analyze if the NSLP specifically helps reduced-price and free meal recipients get closer to attaining higher graduation rate levels over the paying, meal recipient counterparts. Students receiving the reduced-price and free meals are the children who presumably need nutritional compensation the most. State-by-state data on reduced-price and free meals served can help investigate specifically whether these students are impacted by the NSLP. Second, using data at the school district level, instead of statewide,

would allow for a more detailed analysis of the impacts of NSLP. With a more specific group focus, perhaps alternative models such as the difference-in-difference or lagged outcome variable model can be utilized.

These issues notwithstanding, the analysis here provides evidence that the NSLP's nutritional impacts have significant and positive effects on educational outcomes. To the extent that cost and pricing issues reduce access to this program, gains will be lost.

End Notes

[1] This work started as a senior thesis in the Economics Department at the University of Puget Sound in September 2013. I want to thank my thesis professor, Bruce Mann, for his suggestions and guidance on this paper for the past two years. Without him, this work would not have been possible. Additionally, I would like to thank the Kriens Family as this work was funded, in part, by the Kriens Family through a generous grant to support the Kriens Awards/Vita Fund in the Economics Department at the University of Puget Sound. Of course, I take responsibility for all remaining errors and omissions.

[2] Higher than average fast food consumption is defined as four to six times in the last seven days or more.

[3] Sorhaindo and Feinstein found that iron and zinc deficiencies are usually associated with weak neuropsychologic function, growth retardation and development, reduced immunity and vulnerability to sickness. They noted a link between vitamin B deficiency and reduced cognitive scores in adolescence. They also found that iron deficiency could cause developmental challenges in the central nervous system that may later impact cognition.

[4] Higher quality teachers have the potential to affect students beyond school years, too. For example, if student achievement gains are much larger from a higher quality teacher, lifetime earnings could be greater.

[5] The Education Research Center calculates graduation rates by using a Cumulative Promotion Index (CPI) approach (Ebner, 2013). The CPI method captures the high school experience as a process, as opposed to focusing on a single event. It encompasses the four key steps a student must take in order to graduate – three grade promotions (9 to 10, 10 to 11, and 11 to 12) and earning a diploma (12 to graduation). These individual components correspond to a grade-promotion ratio. The CPI approach is defined by:

$$\text{CPI} = (10th \; graders, \; fall \; 2010 \, 9th \; graders, \; fall \; 2009) * (11th \; graders, \; fall \; 2010 \, 10th$$
$$graders, \; fall \; 2009) * (12th \; graders, \; fall \; 2010 \, 11th \; graders, \; fall \; 2009) * (Diploma \; recipents,$$
$$2010 \, 12th \; graders, \; fall \; 2009)$$

[6] There are 46 observations because Florida, Hawaii, Maryland, and Rhode Island did not report statistics for the percentage of novice teachers in year 2010.

[7] According to the data source from the Department of Justice, violent crime includes murder, non-negligent manslaughter, forcible rape, robbery and aggravated assault.

[8] The Breusch-Pagan test indicated no heteroskedasticity problem with the non-constant error terms, and no corrections were needed for years 2000, 2005, and 2010.

[9] The high multicollinearity of the variables in the model bias the standard error estimates of the coefficients. For example, the *NSLP* and *C_POVERTY* variables exhibit high multicollinearity due to the structure of the NSLP program – over half of NSLP participants qualify for free or reduced price meals due to their families' income levels. It could be that the high multicollinearity present in 2000 model bias the *NSLP* variable to insignificance. However, since the *NSLP* variable is significant in both 2005 and 2010, that should serve as support that the *NSLP* variable matters.

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Appendix

Figure A: Average Daily Participation in the NSLP
Data Source: United States Department of Agriculture – Food and Nutrition Service
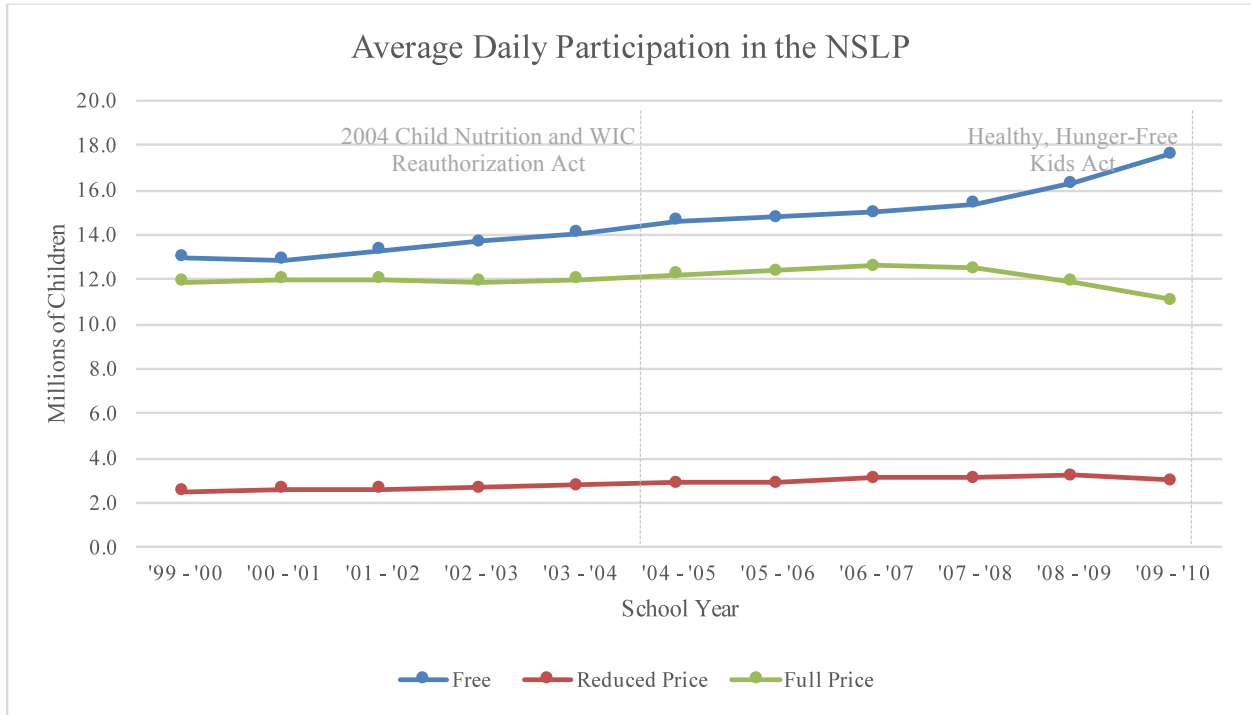

Figure B: Percentage of Free & Reduced-Price NSLP Lunches Served
Data Source: United States Department of Agriculture – Food and Nutrition Service

Percentage of Free & Reduced-Price NSLP Lunches Served

Chart showing "Percentage of Free & RP Lunches" (y-axis, from 52.00% to 66.00%) versus "School Year" (x-axis, from '99 – '00 to '09 – '10). Annotations: "2004 Child Nutrition and WIC Reauthorization Act" and "Healthy, Hunger-Free Kids Act".