

## **Length of the School Day and Its Influence on New Jersey High School Proficiency Assessment Scores**

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### **Abstract**

This paper presents results from an examination of the relationships between high school (HS) school day length and 2011 New Jersey High School Proficiency Assessment (HSPA) Math and Language Arts Literacy test results. Variables found to have an influence on standardized test scores in the extant literature were evaluated and reported. Hierarchical regression models were used to determine the strength of the predictive influence of these variables, specifically school day length, on both HS Math and Language Arts Literacy student performance. Results indicated that school day length does not have a significant influence on HS LAL achievement, but accounts for 1.8% of the variance in HS Math achievement scores. Implications for practicing administrators are discussed.

### **Key Words**

school reform, extended school day, standardized testing

Gaining momentum in legislative circles is the idea that a longer school day and/or year will produce increased student achievement as measured by state mandated standardized tests. Since the initial mention of school time and the learning model proposed by Carroll (1963), school reforms have become cloaked in the belief that more time equals more achievement.

In recent times policymakers, pundits, and education bureaucrats claim that more time in school translates into increased test scores and that somehow affects the ability of the U.S. workforce to better compete globally.

### **Problem, Purpose, and Research Questions**

The purpose for this study was to explain the influence that school day length (as reported in minutes) had on student aggregate performance in New Jersey comprehensive high schools, on the HSPA 2011 Mathematics and Language Arts exam.

This study was guided by the overarching research question: What is the influence of length of school day on the Grade 11, 2011 New Jersey state-mandated High School Proficiency Assessment (HSPA) scores when controlling for student, school, and staff variables?

### **Conceptual Framework**

Zhang & Chen (2008) stated, “Education is different from other kinds of products: its output is not a change in the ‘physical properties’ of students. Educational output includes the increase in knowledge, qualification, attitudes, perceptions, emotions, and skills that students receive from this kind of production process”...“and it is, however, difficult to quantify the increase” (pp. 206-207). “... Educational outputs are influenced by a political process that can respond to local

differences in demand for public education in both budgetary (input) and output dimensions” (Klein, 2007, p. 2).

Furthermore, “... student demographic characteristics and family background better explain their performance on standardized tests than do measures of the resources devoted to their education” (Klein, 2007, p.3).

America has been dazzled by Frederick Taylor’s scientific management framework and has tried to employ structural constructs to education. Specifically, the production-function theory, or the idea that the more one puts in, the more one gets out has driven education reform policies for some time.

Lengthening the school day is a perceived education reform that, in theory, should increase output as measured by students’ results on standardized tests. The theoretical framework for this research study was aligned with input-output models.

### **Literature In A Snapshot**

A review of the literature revealed no statistically significant positive results related to the length of the school day at the high school level in New Jersey and the relationship of this variable on the High School Proficiency Assessment (HSPA). Therefore, the literature presented in this article relates to a broader review of the theories and studies related to the topic.

### **Influences on high school exit exams**

Graduation requirements based on high-stakes, high school exit tests became a universal policy tool in some states including New Jersey in the post No Child Left Behind (NCLB) era.

According to Ou (2009), many marginalized groups do not graduate because “high school exit exams are more prevalent in

states with higher percentages of economically disadvantaged and minority students” (p. 171). McIntosh & Kobler (2012) emphasized that “nearly 7 out of 10 students, and an even larger share of students of color, attend school in states with exit exams. Sixty-nine percent of the nation’s students are enrolled in states with exit exams, including 71% of African American students, 85% of Hispanic students, 71% of low-income students, and 83% of English language learners (ELLs)” (p. 2).

Student socioeconomic status and minority status are variables demonstrated to statistically significantly influence student achievement. McIntosh & Kobler (2012) contended that although results from empirical research says the opposite, “Proponents of exit exams, who often include state governors, chief state school officers, and state boards of education, maintain that requiring students to pass an exam will raise academic achievement and ensure that students graduate from high school with the knowledge and skills needed for college or careers” (p. 36). In fact, “the evidence indicates that low-achieving students—those often targeted by these policies—do not experience gains under the more rigorous exams” (McIntosh & Kobler, pp. 487-488).

Tienken (2011) found a flaw in the construct validity of high school exit (high-stakes) exams, nationally, known as the “conditional standard error of measure” (CSEM), (p.301). CSEM is a margin of error at the proficiency cut points of standardized tests. Tienken (2011) found large margins of error on all state high school exit exams with the New Jersey exam having approximately 10 points of error at the proficiency cut point.

That means that tests results can be  $\pm 10$  points from a student’s individual true scale score. Therefore, many students may in fact

pass the high-stakes test but be categorized as failing and consequently be prevented from graduating from high school.

Furthermore, Tienken (2011) suggested that a policy adjustment should be made to ameliorate the impact of CSEM on any single test score that determines the fate of students and families. No state makes an adjustment for CSEM in their score reporting.

### Student school attendance

Student school attendance has been linked to achievement. Gottfried (2010) evaluated the relationship between student attendance and achievement in Philadelphia elementary and middle schools. “Positive and statistically significant relationships between student attendance and academic achievement as expressed in GPA for both elementary and middle school students” was found (Gottfried, 2010, p. 434).

“The effect sizes, as defined by the standardized regression coefficient, ranged from 0.24 to 0.34, thereby indicating that the attendance-achievement relationship is fairly consistent for the full sample and across elementary and middle school sample” (Gottfried, 2010, p. 446).

Math achievement was especially sensitive to school absenteeism as well as standardized test scores, graduation and dropout rates (Balfanz & Byrnes, 2012, p. 3). Several researchers reported that students with healthier attendance histories had stronger test performance (Balfanz & Byrnes, 2006; Lamdin, 1996). Roby (2003) concluded that based on the analysis of educational outcomes in Ohio for 3,171 schools (711 schools for 9th grade and 691 schools at 12th grade), a statistically significant relationship existed between attendance and achievement in 4th, 6th, 9th, and 12th grades.

### Socioeconomic status

Abrams & Kong (2012), Graziano (2012), and Tienken (2012) supported and conveyed the fact that SES directly influences student achievement. Researchers studying student mobility also established that SES has a greater influence on Math than on LAL performance (Ashby, 2010; Xu, Hannaway, & D'Souza, 2009). Tienken (2012) advised that disadvantaged students, as a group, have never been reported as scoring higher than their more advantaged peers, as a group, on any state test at any grade level.

The achievement differences between economically disadvantaged and economically advantaged students ranged from 12 to 36 percentile points on state-mandated high school tests of language arts and mathematics (Tienken, 2012).

What makes a difference in student achievement: "Family background characteristics and other out-of-school factors clearly have a profound influence on students' academic achievement" (Abrams & Kong, 2012; Coleman, 1988; Sirin, 2005; West, 2012, p. 38) In fact, Coleman et al. (1966) first espoused that minority children (with weak family educational backgrounds) are likely to have increases in achievement when they are schooled with students with strong family educational backgrounds (p. 22).

Abrams and Kong (2012) ascertained that "research demonstrates that socioeconomic status (SES) is the strongest predictor of academic achievement" (Abrams & Kong, 2012, p. 1, 18). Abrams and Kong (2012) are supported in this finding by other researchers: Caldas, 1993; Coleman et al., 1966; Sirin, 2005; and White, 1982.

Graziano (2012) summed up the research on SES in this way:

...a school's average student characteristics, such as poverty and attitudes toward school, often had a greater impact on student achievement than teacher and schools and that the average teacher characteristics at a school had a small impact on a school's mean achievement (Graziano, 2012, p. 54).

### Length of school day

Patall, E., Cooper, H., & Allen, A. B. (2010) sum up the frenzy among policymakers regarding increasing the length of the school day or year: "Policymakers are drawn to using time as a lever for reform even though no guarantee of improved student learning exists...the cost to states are estimated at \$2.3 to \$12.4 million for each additional day for school." (p. 3).

Patall et al. (2010) prepared a systematic review of all the research from 1985-2009 on the length of the school day and located 15 research studies some of which reported effect sizes and findings (these can be found in the appendices of Patall et al. (2010) and synthesized in deAngelis, P. (2014), p. 75.

According to Patall, et al. (2010) (who conducted a national meta-analysis) the majority of studies dealing with the relationship of education time to student achievement looked at the total number of schools days or hours students are required to attend school, while other studies focused on engaged time or academic instructional learning time.

In some cases the time variable was not clearly specified. These inconsistencies made it difficult to make comparisons. Mixed findings about the degree to which time influences student learning complicates the issue. Despite this, the literature revealed a fairly consistent pattern (Patall et al., 2010, p. 3):

1. There is little or no relationship between allocated time and student achievement.
2. There is some relationship between engaged time and achievement.
3. There is a larger relationship between instructional time and achievement.

## Quantitative Methodology

The sample for the study was selected purposefully to represent only New Jersey's public, comprehensive, and academic secondary schools that reported all required information related to school, staff, and student variables to the New Jersey Department of Education (NJDOE).

From the more than 400 public secondary schools in New Jersey, 326 met the sampling requirements. Vocational schools, special services school districts/special education schools, and charter schools were excluded from the study to ensure all results obtained from the analysis were attributed to a typical district New Jersey public high school. The unit of analysis for this study was at the school level.

This explanatory, non-experimental study used a correlational research design and hierarchical multiple regression analyses (at a single point in time) to measure the relationship between two variables: length of school day and Grade 11 NJ 2011 HSPA scores. The analysis provided quantitative descriptive research on the relationship of length of school day in New Jersey secondary schools Grade 11 students in "A-J" districts and scores on the NJ Grade 11, 2011 HSPA (Note: "A" schools represent the lowest socio economic communities while "J" schools represent the wealthiest economic communities).

HSPA was used to determine student achievement in reading, writing, and mathematics as specified in the New Jersey Core Curriculum Content Standards for Grade 11. The NJ HSPA scores are scaled to fit into the 100-300 range of possible points available, where >200 is Passing/Proficient.

A "simultaneous" data entry method (using the SPSS comprehensive statistical analysis and data management software product) created statistical models used to structure a series of hierarchical regression models (Witte & Witte, 2010).

When the predictor variables (i.e., staff, school, and student) were entered into SPSS using the hierarchical regression method the models provided data on the specific contribution of each variable on HSPA LAL and Math student performance. In this study the untransformed dependent variable 2011 HSPA Passing score is identified as TP+AP (total proficient and advanced proficient) with MA Transformed labeled TPReflect and LA Transformed referenced as TPLA\_Reflxt.

The independent variables included staff, student, and school: a) Staff-Faculty attendance rate (FAttend), faculty mobility rate (FMobility), and Percentage of staff with master's degrees or higher (MA+); b) Student-attendance Rate (G11Attend), student mobility rate (STMOB), percentage of students eligible for free or reduced lunch (SES), percentage of students with disabilities (DIS), and percentage of students with limited English (LEP); c) School-Length of the school day (SCHDAYL) and school size (enG9to12).

A difference in this study from other studies about school day length was that the variables of school day length and SES strata

were analyzed separately (as well as analyzed with and without the covariate of attendance). To apply findings at the school or district level, passing percentage changes were calculated between short, medium and long day lengths.

## Results and Discussion

Results from this study suggested that school day length is a statistically significant predictor but weak predictor of HSPA Math performance and not a statistically significant predictor of LAL performance (illustrated in Table 1).

Table 1

*Summary of Statistically Significant Hierarchical Regression Standardized Beta Values by Predictor Variables*

	Grade 11 MA $\beta$	Grade 11 LA $\beta$
SES	-.550	-.382
G11attend	.407	.576
DIS	—	-.067
FMOBILITY	—	-.074
SCHLDAYL	.140	—

Table 2 displays the major findings from the hierarchical multiple regression analysis that used log 10 transformed (TPReflect/Reflex) and untransformed data from the performance data obtained from the total proficient (TP) and advanced proficient (AP) scores on 2011 NJ HSPA Language Arts (LA) and Math (MA).

The final hierarchical regression models (when using the transformed dependent variable) for both MA and LA had significant predictive capabilities on the HSPA passing rates. The fact that the adjusted  $R^2$  of 64.0% for LA was about five percentage points higher than the MA adjusted  $R^2$  of 58.7% showed that the LA regression model had slightly higher predictive power than the MA model.

Both MA and LA socioeconomic status (SES) had the greatest influence on HSPA

passing percentages; the extant literature supports this outcome. This was demonstrated by the fact that SES had the largest  $R^2$  value contribution—43.1% for MA and 48.1% for LA—in each subject's final regression model. Unfortunately, SES is a variable that schools have little power to change and hence the predictive powers of other more administratively mutable variables need to be examined.

The other significant variables for MA included G11attend (student attendance), SCHDAYL, and MA+, while for LA the significant variables were G11attend, SCHDAYL, DIS, MA+, and enrG9to12 (student enrollment). The variables that school administrators have some ability to change include G11attend, SCHDAYL, MA+, and enrG9to12.



Table 2

*Summary of Major Findings from Hierarchical Regressions*

HSPA Subject & Dependent Variable	Variables & Significance	Sig. Variables & Standardized Beta's* ( $\beta$ )	Adjusted $R^2$ (% of Variance Explained by the Model)	SCHDAYL $p$ -value
<b>MA TP+AP</b>	SES (.000) G11attend (.000) SCHDAYL (.000)	SES (-.55) G11attend (.41) SCHDAYL(.14)	69.3% * (Model 3)	Statistically significant (.000)
<b>MA TPReflect*</b>	SES (.000) G11attend (.000) SCHDAYL (.000) MA+ (.003) DIS (.255)	SES (.50) G11attend (-.30) SCHDAYL (-.23) MA+ (-.12) DIS (.04)	58.7% (Model 5)	Statistically significant (.000)
<b>LA TP+AP</b>	G11attend (.000) SES (.000) DIS (.040) FMOBILITY (.026) FATTEND (.057)	G11attend (.58) SES (-.38) DIS (-.07) FMOBILITY (.07) FATTEND (-.07)	68.5% (Model 5)	Not statistically significant (.151)
<b>LA TPLA_Reflex*</b>	SES (.000) G11attend (.000) SCHDAYL (.000) DIS (.000) MA+ (.010) enrG9to12 (.037)	SES (.46) G11attend (-.33) SCHDAYL (-.18) DIS (.15) MA+ (-.10) enrG9to12 (-.08)	64.0% (Model 6)	Statistically significant (.000)

\*Note: Regressions with transformed dependent variables have a standardized  $\beta$  (Beta) whose signs are opposite. A negative  $\beta$  (Beta) value means that the associated predictor variable has a positive relationship with the HSPA passing percentage similarly a negative  $\beta$  (Beta) value means that the predictor variable has a positive relationship with the HSPA passing percentage.

The fact that the adjusted  $R^2$  value for the final hierarchical MA model with the untransformed dependent variable is about 11 percentage points higher than that for the final hierarchical MA model with the transformed dependent variable (69.3% vs. 58.7%) suggests that the regression model using the untransformed dependent variable is superior to (in the sense that it has more predictive power) than the regression model using the transformed variable.

The data in Table 3 suggest that for schools serving larger proportions of students from poverty, lengthening the school day from a short to a median day virtually had no impact on HSPA MA passing rates.

Interestingly, increasing the school day from a median length to a long length day resulted in a rise of about 6 percentage points in the passing rate on HSPA MA for poor schools.

Subsequent analysis on the median and wealthy SES schools showed little variation in the HSPA LA passing percentages when the length of the school day was increased.

For the poorer schools the HSPA LA passing rate declined from a short to a median length day but improved about 3.5 points when the school day was increased from a median to a long day.

Table 3

*Influence of the Length of the School Day by SES Category*

SES Category	MA SCHDAYL Short to Med Range =347-397 Median=390	MA SCHDAYL Med to Long Range=398-415 Median= 406	MA SCHDAYL Short to Long Range= 416-515 Median=435	LA SCHDAYL Short to Med Range =347-397 Median=390	LA SCHDAYL Med to Long Range=398-415 Median= 406	LA SCHDAYL Short to Long Range= 416-515 Median=435
<b>Poor</b> (Mean SES =59.9%)	0.14 %	5.75 %	5.89 %	-2.48 %	3.35 %	0.87 %
<b>Med</b> (Mean SES =19%)	0.84 %	0.30 %	0.14 %	-0.43 %	-0.60 %	-1.02 %
<b>Rich</b> (Mean SES =19%)	1.98 %	0.59 %	2.56 %	0.22 %	-0.70 %	-0.49 %

The estimated marginal means illustrated in Figures 1 and 2 highlighted each SCHDAYL/SES bin combination mean passing percentage, after controlling for differences in student attendance rates among the schools included in the study.

Even when controlling for differences in student attendance rates, the length of the school day had little influence on HSPA MA passing percentages for the both rich schools and median SES schools. Increasing the school day for the poorest schools from a median to a long day did increase the MA passing

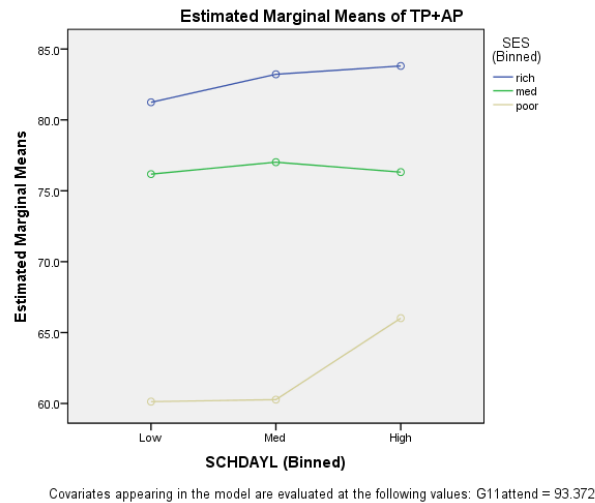
percentage by about 6 points. Although the graphs in Figures 1 and 2 look impressive, the increases do not come close to putting student performance on par with that of schools serving less poor youth.

However, for LA a decline in scores for the poorest schools is illustrated when a short day is replaced by a median length day and the scores only increased slightly when a longer day is implemented. Both the median and wealthier schools LA scores decline when the school day is lengthened.

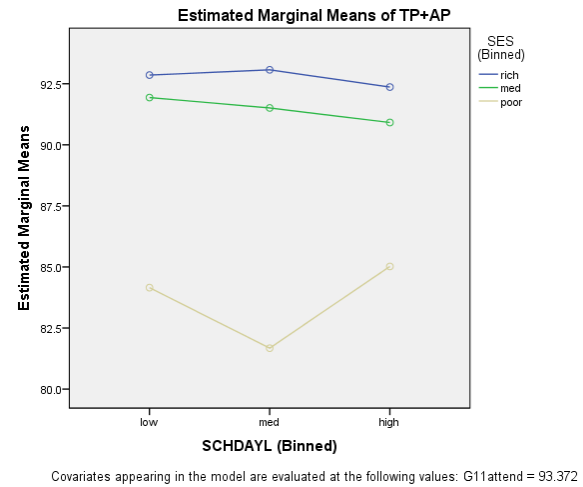


**Figure 1.**

MA estimated marginal means untransformed dependent variable (TP+AP) with binned SCHDAYL and SES with covariate G11 attend.

**Figure 2.**

LA estimated marginal means untransformed dependent variable (TP+AP) with binned SCHDAYL and SES with covariate G11attend.



## Implications for Practice

Socio-economic status (-.55), student attendance (.41) and school day length (.14) accounted for 69.3% of the variance in model 3 for HSPA Math. Whereas model 5 for Language Arts HSPA accounted for 68.5% of the variance in test results: student attendance (.58), socio-economic status (-.38), students with disability (-.07), faculty mobility (.07), faculty attendance (-.07).

The length of the school day was not statistically significant (.151). The strongest predictor of student achievement on HSPA was socio-economic status. After SES, G11attend (student attendance) had the highest  $R^2$  contribution to the HSPA passing percentage rate at about 10% for both subjects.

School principals need to be proactive in their quest to build relationships and to educate families about the importance of student school attendance. Parents participating in parent

conferences, PTA meetings and family nights, especially in poorer districts, can increase student achievement at the high school level. “Research shows that families are more likely to be involved when staff reach out to them and also when they feel that their involvement is appropriate and will be effective” (Hoover-Dempsey & Sandler, 1997; Moll, Amanti, Neff, & Gonzalez, 1992, as cited by Kakli et al. p. 11).

For learning to occur, especially for students low-income designated strata, students need to attend school and be in class learning (Gottfried, 2010). The analyses in this study showed a significant and positive relationship between student attendance and academic achievement. Therefore, more focus on attendance policies that have the potential to positively influence HSPA passing percentage rates should gain administrative focus, including increasing parent awareness about the importance of students being in the classroom.

Children have to attend school in order to learn; chronic absenteeism for any child for any reason is detrimental to their ongoing development but even more profound for younger children of poverty.

The subject of math is particularly sensitive to student attendance and researchers reported that students with better attendance records, especially those of poverty, have stronger test performance (Balfanz & Byrnes, 2006, 2012; Lamdin, 1996).

When a student misses class time, the missed time negatively affects academic achievement. Research consistently showed that more instructional time led to higher achievement (Dreeben & Gamoran, 1986, cited by Kubitschek, Hallinan, Arnett, Galipeau, 2005). Principals can increase accountability for non-instructional time at the local level.

Because of the significant expense in lengthening the school day for all schools, policies and practices should be more focused on creating strategies that improve student attendance rates.

Missed class time within the high school day is not tracked. Students are known to miss class time for assemblies, field trips, testing, college interviews, public service activities, sports events, rehearsals or actual musical/theatrical programs, guidance counselor or discipline meetings, missed time due to schedule changes, in-school and out-of-school suspensions as well as a host of other events.

This missed class time (non-instructional time) needs to be controlled and tracked by administration so that student

learning is not negatively impacted (Aaronson et al., 1998).

## Recommendations for Future Research

Obviously a single study cannot relate all the elucidations that influence student achievement on a state's exit exam. However, the variables examined in this study were taken from the NJ School Report Card data to provide direction for further research and enable local district level use.

The results of this study were supported in the extant literature by the factors identified as influencing student achievement. The following topics may add value to the extant literature on the influence of the length of the school day and student high school exit exam achievement:

1. Devise a high school study to examine the actual minutes used for non-instructional purposes.
2. Conduct a study on early academic interventions for freshman and sophomore high school students who score low on state standardized tests in math and language arts.
3. Conduct a study to compare the curriculum and academic interventions among schools with the highest and lowest school day lengths.
4. Conduct a study on high schools with the highest and lowest poverty rates to compare the curriculum and academic interventions provided for low scoring standardized testers.
5. Design a study that examines the influence of parent involvement at the high school level on the passing rates of the HSPA.

### **Author Biography**

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#### **Author note:**

This work is adapted from a paper presented at the annual conference of the National Council of Professors of Educational Administration (NCPEA), August 5, 2015, Washington. DC.

## References

- Abrams, K., & Kong, F. (2012). *The variables most closely associated with academic achievement: A review of the research literature*. Omaha, NE: Progressive Research Institute of Nebraska, 1-27.
- Arnold, D. (2014). *Longer school days affect everyone, consider all opinions before enacting a law*. National Education Association. Retrieved from <http://www.nea.org/home/14511.htm>.
- Ashby, C. M. (2010). K-12 Education: Many Challenges Arise in Educating Students Who Change Schools Frequently. GAO Reports, 1-49. Retrieved from <http://www.gao.gov/products/GAO-11-40>
- Balfanz, R., & Byrnes, V. (2006). Closing the mathematics achievement gap in high-poverty middle schools: Enablers and constraints. *Journal of Education for Students Placed at Risk*, 11(2), 143–159.
- Balfanz, R., & Byrnes, V. (2012). *The importance of being in school: A report on absenteeism in the nation's public schools*. Baltimore, MD: The John Hopkins University.
- Caldas, S. J. (1993). Reexamination of input and process factor effects in public school achievement. *The Journal of Educational Research*, 86(4), 206-214.
- Carroll, J. B. (1963). A model of school learning. *Teachers College Record*, 64(8), 723-733.
- Coleman, J. S., Campbell, E. Q., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F. D., & York, R. L. (1966). *Equality of educational opportunity*. Washington, DC: U.S. Government Printing Office.
- Coleman, J. (1988). Social capital in the creation of human capital. *American Journal of Sociology, Supplement*, 94, S95-S120.
- Cuban, L. (2008). The perennial reform: Fixing school time. *Phi Delta Kappa*, 90(4), 241-250.
- Deangelis, P. (2014). *The influence of the length of the school day on grade 11 NJ HSPA scores. (Doctoral Dissertation)*. Retrieved from ProQuest Dissertations and Theses database (ID No. 1564756061).
- Deslandes, R. (2005). Motivation of parent involvement in secondary-level schooling. *The Journal of Education Research*, 98(3), 164-175.
- Gottfried, M. A. (2010). Evaluating the relationship between student attendance and achievement in urban elementary and middle schools: An instrumental variables approach. *American Educational Research Journal*, (2), 434-467. doi:10.2307/40645446

- Gottfried, M. A. (2011). The detrimental effects of missing school: Evidence from urban siblings. *American Journal of Education*, 117, 147–182. doi:10.1086/657886
- Graziano, D. (2012). *The relative influence of faculty mobility on NJ HSPA scores*. (Doctoral Dissertation). Retrieved from ProQuest Dissertations and Theses database. (ID No. 1470242142)
- Kakli, Z., Kreider, H., Little, P., Buck, T., & Coffey, M. (2006). Focus on families! How to build and support family-centered practices in after school. Boston, MA: Harvard Family Research Project and Build the Out-of-School Time Network. Retrieved from [http://www.hfrp.org/content/download/1075/48578/file/focus\\_on\\_families.pdf](http://www.hfrp.org/content/download/1075/48578/file/focus_on_families.pdf).
- Klein, C. C. (2007). *Efficiency versus effectiveness: Interpreting education production studies* (Department of Economics and Finance Working Paper Series). Retrieved from <http://capone.mtsu.edu/berc/working/Klein2007b.pdf>
- Kubitschek, W. N., Hallinan, M. T., Arnett, S. M., & Galipeau, K. S. (2005). High school schedule changes and the effect of lost instructional time on achievement. *High School Journal*, 89(1), 63-71.
- Lamdin, D. J. (1996). Evidence of student attendance as an independent variable in education production functions. *The Journal of Educational Research*, (3), 155. doi:10.2307/27542026
- Marschall, M. (2006). Parent involvement and educational outcomes for Latino students. *Review of Policy Research*, 23(5), 1053-76.
- McIntosh, S., & Kober, N. (2012). *State high school exit exams: A policy in transition*. Washington, DC: Center on Education Policy.
- New Jersey Department of Education (NJDOE). (2006a). *Your guide to the HSPA New Jersey Department of Education High School Proficiency Assessment (HSPA) March 2006*. Retrieved from [http://www.nj.gov/education/assessment/hs/hspa\\_guide\\_english.pdf](http://www.nj.gov/education/assessment/hs/hspa_guide_english.pdf)
- New Jersey Department of Education (NJDOE). (2006b). *High school proficiency assessment (HSPA). A mathematics handbook: Open ended questions*. Retrieved from [http://www.state.nj.us/education/assessment/hs/hspa\\_mathhb.pdf](http://www.state.nj.us/education/assessment/hs/hspa_mathhb.pdf)
- New Jersey Department of Education (NJDOE). (2010). *Funding period twelve (7/1/09 – 6/30/10), Free and reduced lunch data*. Retrieved from <http://www.state.nj.us/education/techno/teleact/>
- New Jersey Department of Education (NJDOE). (2011b). *DOE archives, historical report card data 2011*. Retrieved from <http://www.state.nj.us/education/reportcard/2011/index.html>

- New Jersey Department of Education (NJDOE). (2011c). *New Jersey high school proficiency assessment spring 2011 executive summary*. Retrieved from <http://www.state.nj.us/education/schools/achievement/2012/hspa/summary.pdf>
- New Jersey Department of Education (NJDOE). (2011d). *Understanding accountability in New Jersey for 2011*. Office of Student Achievement and Accountability. Retrieved from <http://www.nj.gov/education/title1/accountability/ayp/1112/understanding.pdf>
- New Jersey Department of Education (NJDOE). (2012a). *2011\_Report card data downloads*. Retrieved from <http://education.state.nj.us/rc/rc11/database.htm>
- New Jersey Department of Education (NJDOE). (2012b). Department of education releases user-friendly school report cards for 2010-11 school year. Retrieved from <http://www.state.nj.us/education/news/2012/0531rc.htm>
- New Jersey Department of Education (NJDOE). (2013a). *How does your school measure up?* Retrieved from <http://www.state.nj.us/education/parents/measure.htm>
- New Jersey Department of Education (NJDOE). (2013b). *New Jersey public schools fact sheet*. Retrieved from <http://www.state.nj.us/education/data/fact.htm>
- New Jersey Department of Education (NJDOE). (2013c). *NJ school performance reports –Interpretive guide*. Retrieved from <http://education.state.nj.us/pr/NJSchoolPerformanceInterpretiveGuide.pdf>.
- Ou, D. (2009). To leave or not to leave? A regression discontinuity analysis of the impact of failing the high school exit exam. *Economics of Education Review*, 29(2), 171-186. doi:10.1016/j.econedurev.2009.06.002
- Outhouse, C. (2012). Carnegie units and high school attendance policies: An absence of thought?!?. *Journal of Cases in Educational Leadership*, 15(4), 3-21.
- Patall, E., Cooper, H., & Allen, A. B. (2010). Extending the school day or school year: A systematic review of research (1985-2009). *Review of Educational Research*, 80(3), 401- 436.
- Roby, D. E. (2003). Research on school attendance and student achievement. A study of Ohio schools. *Educational Researcher Quarterly*, 28(1), 3-14.
- Schachter, R. (2014). Extending the school day. Extra time is being championed by reformers left and right. *Scholastic Administrator*, 10(5), 42-44. Retrieved from <http://www.scholastic.com/browse/article.jsp?id=3755837>
- Silva, E. (2007, January). On the clock: Rethinking the way schools use time. *Education Sector*, 1–22. Retrieved from [http://www.educationsector.org/usr\\_doc/OntheClock.pdf](http://www.educationsector.org/usr_doc/OntheClock.pdf)

- Silva, E. (2012). Off the clock: What more time can (and can't) do for school turnarounds. *Education Sector*, 1-12.
- Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, 75(3), 417-453.
- Tienken, C. H. (2011). High school exit exams and mismeasurement. *The Educational Forum*, 75, 298-314.
- Tienken, C. H. (2012). Poverty matters. *AASA Journal of Scholarship and Practice* 9(1), 3-6.
- Tienken, C. H. (2012). The influence of poverty on achievement. *Kappa Delta Pi Record*, 48(3), 105. doi:10.1080/00228958.2012.707499
- West, M. (2012). Global lessons for improving U. S. education. *Issues in Science & Technology*, 28(3), 37-44.
- White, K. R. (1982). The relation between socioeconomic status and academic achievement. *Psychological Bulletin*, 91(3), 461-481.
- Witte, R. S., & Witte, J. S. (2010). *Statistics* (9th ed). Hoboken, NJ: Wiley & Sons.
- Xu, Z., Hannaway, J., D'Souza, S. (2009). *Student transience in North Carolina: The effect of school mobility on student outcomes using longitudinal data* (Working Paper 22). Cambridge, MA: National Center of Analysis of Longitudinal Data In Education Research. Retrieved from <http://www.urban.org/publications/1001256html>
- Zhang H., & Chen X. (2008). An extended input-output model on education and the shortfall of human capital in China. *Economic Systems Research*, 20(2), 205-221. doi:10.1080/09535310802075414