Volume 17 Issue 28
Originally issued as C4



Global Journal of human-social science: C
Sociology & Culture
Volume 17 Issue 4 Version 1.0 Year 2017
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-460x & Print ISSN: 0975-587X

Differences in Student Participation and Performance in Advanced Coursework as a Function of Economic Status

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GJHSS-C Classification: FOR Code: 160899



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Differences in Student Participation and Performance in Advanced Coursework as a Function of Economic Status

Robert R. Michaels-Johnson [α] & John R. Slate [σ]

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I. Introduction

In 1964, then-President Lyndon B. Johnson, during his State of the Union Address to a joint session of the United States Congress, declared war on poverty. In that speech, Johnson announced, "Our aim is not only to relieve the symptoms of poverty, but to cure it and, above all, to prevent it" (Matthews, 2013, para. 2). Attacking poverty as a disease to be vanquished like rubella, smallpox, and polio, Johnson's legislative efforts to end poverty in America became the cornerstone of his broader political agenda to build a *Great Society*. Now, after 50 years, Johnson's ideals have instead left a great divide.

That divide is the difference in academic achievement between students who are economically disadvantaged and those students who are notin poverty. In fact, counter to the efforts of many politicians and education reformers to bridge this gap, the reality is, "in the United States over the last few decades these differences in educational success between high- and lower-income students have grown substantially" (Reardon, 2013, para. 3). According to a 2015 report on the effects of economic status on academic performance, demographics are determining destiny. Low-income students, primarily those students identified as high-ability, are being relegated to a "persistent talent underclass" (Plucker, Giancola, Healey, Arndt, & Wang, 2015, p. 1).

Although policy leaders agree establishing parity between those students who are economically disadvantaged and those students who are not in poverty has been a fundamental goal of educational reform and legislative efforts over the decades, rather than seeing the gap narrow, the separation has widened (Klug man, 2013). Writing for Jobs for the Future, Vargas (2013) noted some startling national statistics: only 65% of students in poverty who start eighth grade finish high school, 23% of students in poverty who start high school are prepared for a postsecondary level of academic work, and 17% of students in poverty ultimately earn any type of academic degree. This last statistic was in comparison to 57% of higher-income students who eventually complete a degree. Klug man (2013) commented, "In the United States, inequalities in opportunities to learn high-level curricular content are stark reminders that equality of educational opportunity has yet to be achieved" (p. 2).

The consequence of this persistent inequity has been a slow unraveling of the American social fabric. Essentially, half of America's students, an estimate of the number of students in poverty, are ill-equipped for either the workforce or for postsecondary educational opportunities (Reardon, 2013). As family income becomes the best predictor of a student's success in school, "the inadequacy of educational policies for such a large group of students has enormous implications for social mobility, preservation of the American Dream, and the nation's future economic prosperity" (Plucker et al., 2015, p. 3). The American educational system has not resolved the plight of its students in poverty but has instead become an unwitting accessory to the country's growing income inequality (Reardon, 2013).

However, this conundrum has not gone unaddressed by either the educational establishment, or by those persons who champion for the rights and benefits of persons who are economically disadvantaged. The No Child Left Behind legislation was established to address educational inequities in its various forms, including economic disparities (Welton & Williams, 2014). Discussing the specific steps taken in Texas, Welton and Williams (2014) critiqued the state's

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accountability system in light of its efforts to address the academic and college-ready needs of students in poverty. They determined, although initially designed to ensure students were ready for college or career, high-stakes tests undermined that purpose. Instead, because teachers lowered academic standards to concentrate on test-preparation, student achievement and college readiness declined. Welton and Williams (2014) concluded, "high school policies, especially in under-sourced and low-performing high schools, limit the academic preparation necessary for college because the pressure to meet tough accountability sanctions shifts the school-wide instructional focus to exit exam preparation" (p. 183). Additionally, they observed, despite recent greater flexibility in the federal accountability system, Texas continued to administer a test-based accountability system that, "de-emphasized college rigor and readiness" (p. 182).

Consequently, in Texas and across the nation, states and districts have depended on Advanced Placement and International Baccalaureate courses to fulfill the need for greater academic rigor and to ensure student college-readiness. Both the College Board that administers the Advanced Placement program and the International Baccalaureate Organization that oversees International Baccalaureate Diploma Program examinations have published statements outlining their commitments to help students who are economically disadvantaged effectively prepare for college. The International Baccalaureate Organization in its research brief on accessibility stated, "Nationally, research suggests that students from low-income backgrounds are less likely to obtain the high school qualifications that are needed in order to access college and to persist and perform at a high level once there" (Gordon, Vander Kamp, & Halic, 2015, para. 2). They continued by proclaiming the International Baccalaureate Organization was "committed to foster a more diverse and inclusive IB (International Baccalaureate) community, enabling access to a rigorous education regardless of personal circumstances" (Gordon et al., 2015, para. 3). The International Baccalaureate Organization substantiated its claim by declaring all International Baccalaureate graduates, including students in poverty, are admitted and attend college at similar rates (Gordon et al., 2015).

Similarly, the College Board asserted

In light of recent studies showing that parental income and educational level are the best predictors of high school success, we felt it imperative to also begin a conversation that will examine the equity gap in AP (Advanced Placement) participation and success for low-income students. (2014, para 10).

They supported their commitment to overcoming the achievement gap between students who were economically disadvantaged and students who were not economically disadvantaged by presenting data establishing a strong pattern of growth in the number of Advanced Placement examinees who were low-income. Comparing the class of 2003 with the class of 2013, the College Board indicated the number of Advanced Placement examinees who were low-income almost quadrupled over the decade (College Board, 2014).

Support for the claims of the College Board and the International Baccalaureate Organization can be located in empirical research studies. Jobs for the Future held schools offering more Advanced Placement courses were exercising a promising strategy to increase the college readiness of students in poverty (Vargas, 2016). They further contended such coursework improved student persistence in high school and college, leading to higher rates of college completion. Plucker et al. (2015) also supported Advanced Placement and International Baccalaureate coursework as avenues to bridge the in poverty and high-income achievement and college-readiness gap. Among their recommendations for more effectively educating high-potential students in poverty, was an endorsement to "ensure that all high-ability students have access to advanced educational services" (p. 2), which included enrollment in Advanced Placement and other accelerated coursework. Additionally, Culross and Tarver (2011) confirmed claims of the International Baccalaureate Organization that students in the International Baccalaureate's Diploma Program "had a greater breadth and depth of knowledge, improved creative and critical thinking skills, and improved oral and written communication skill" (p. 236). In essence, International Baccalaureate students were college ready.

II. Statement of the Problem

Historically, students in poverty have encountered fewer opportunities to access postsecondary educational options (Welton & Williams, 2014) than their more privileged peers. One way their choices have been curtailed has been through the number and quality of high school advanced coursework offerings available to students in poverty. In an effort to increase these course options for students in poverty, many school districts have been encouraged and have taken steps to implement programs designed to encourage individual school campuses to provide more advanced coursework options to all students, including Advanced Placement and International Baccalaureate Diploma-level courses (College Board, 2014; Sparks, 2015).Unfortunately, such efforts have fallen short of their intention, and students in poverty have continued to access advanced coursework at a lower rate than their peers. Consequently, postsecondary education opportunities for these

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students is limited (Plucker et al., 2015).Citing a lack of financial resources to provide for teacher training and student interventions, educational leaders continue to grapple with determining effective means to equalize student access to advanced coursework and to close the performance gap preventing students from being college-ready (Klugman, 2013).

III. Purpose of the Study

Despite efforts to close these performance gaps, students in poverty access advanced coursework at statistically significantly lower rates than the general student population (Plucker et al., 2015). Relatedly, if enrolled in advanced coursework, students in poverty tend to perform less successfully than their peers who are not poor (Welton & Williams, 2014). The purpose of this study was to determine, by examining Texas Academic Performance Reports data, if these disparities in advanced coursework enrollment and performance existed in Texas, and, if so,the extent to which they were present.

IV. Significance of the Study

Results from this investigation will add to the already existing body of research on the relationship between student economic status and student academic achievement. More specifically, the findings of this study could be used to highlight the disparity in the levels of college readiness for students in poverty as compared to students not in poverty. Additionally, investigative findings and the associated discussion could assist individual campuses, as well policymakers, in identifying and justifying efforts to narrow the achievement and college-readiness gaps existing between students in poverty and their peers.

V. Research Questions

The following research questions were addressed in this investigation: (a) What is the effect of economic status on the percent of students taking advanced coursework in Texas high schools in the 2013-2014 school year?; (b) What is the effect of economic status on the percent of students taking advanced coursework in Texas high schools in the 2014-2015 school year?; (c) What is the effect of economic status on the percent of students scoring above criterion in advanced coursework in Texas high schools in the 2013-2014 school year?; and (d) What is the effect of economic status on the percent of students scoring above criterion in advanced coursework in Texas high schools in the 2014-2015 school year?

VI. Method

a) *Research Design*

A causal-comparative research design was used in this study. In causal-comparative research, attempts are made to determine the cause of differences already existing between groups (Creswell, 2014).Analyzed in this investigation were archival data taken from the Texas Education Agency's Texas Academic Performance Reports to determine the effect of economic status on the enrollment and performance of high school students in advanced coursework.

b) *Participants and Instrumentation*

Aggregated campus-level data were obtained from the Texas Academic Performance Reports of the Texas Education Agency for the 2013-2014 and 2014-2015 school years. Initially obtained as an Excel spreadsheet document, the data were imported into the Statistical Package for Social Sciences (SPSS) software program. The data, as reported by school districts to the Texas Education Agency, were assumed to be accurate. This assumption was made because of the data audits routinely conducted by the Texas Education Agency.

c) *Definition of Terms*

As the data for this investigation were obtained from the Texas Education Agency and involved the participation and performance of Texas high school students, an understanding of the terms associated with this study as they were defined by the Texas Education Agency, was necessary. *Economically Disadvantaged* referred to the count and percentage of students eligible for free or reduced-price lunch or eligible for other public assistance (Texas Education Agency, 2016).*Advanced coursework completion* equaled the percentage of annual graduates who completed at least one Advanced Placement course from the College Board or at least one course from the International Baccalaureate's Diploma Program (Texas Education Agency 2016).In this study, course completion was also referenced as advanced coursework completion. To be *above criterion* on the associated advanced coursework assessments, students must have been awarded a minimum score of 3 out of 5 on an Advanced Placement examination, or a minimum score of 4 out of 7 on an International Baccalaureate examination (Texas Education Agency, 2016).

VII. Results

Prior to conducting inferential statistics to determine whether statistically significant differences were present between the percent of students in poverty and all students who took advanced coursework, checks were conducted to determine the extent the data were normally distributed. Similarly, checks were conducted to determine if normal distributions were present for the percent of students in poverty and the percent of all students who scored above criterion in advanced coursework. These checks were performed for both the 2013-2014 and the 2014-2015 school years. An examination of the standardized skewness

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coefficients (i.e., the skewness value divided by its standard error) and the standardized kurtosis coefficients (i.e., the kurtosis value divided by its standard error) revealed large deviations from normality; 15 out of 16 standardized coefficients were outside the bounds of normality of +/-3 (Onwuegbuzie & Daniel, 2002).

Because the data for the research questions were not normally distributed, a nonparametric statistical procedure had to be utilized (Slate & Rojas-Le Bouef, 2011). Accordingly, a nonparametric Wilcoxon's dependent samples *t*-test (Huck, 2007) was used to address each question. A dependent samples *t*-test was an appropriate inferential statistical procedure to calculate when the variables (i.e., percent of students in poverty and the percent of all students taking advanced coursework and scoring above criterion) are related (Slate & Rojas-Le Bouef, 2011). In this investigation, both variables were present for the same groups of students and were at the interval/ratio level of measurement.

For research question one, the Wilcoxon's dependent samples *t*-test yielded a statistically significant difference between the percentage of students in poverty and all students completing advanced coursework in the 2013-2014 school year, $z = 25.42$, $p < .001$. The effect size associated with these differences was below small, Cohen's *d* of 0.19 (Cohen, 1988). Students in poverty had statistically significantly lower participation rates than all students at 3.50%. Descriptive statistics for this analysis are presented in Table 1.

Table 1: Descriptive Statistics for Percent of Students Taking Advanced Coursework for the 2013-2014 School Year

Student Group	*n* of schools	*M%*	*SD*
Students in Poverty	1,681	11.31	17.15
All Students	1,681	14.81	19.00

For the 2014-2015 school year, the Wilcoxon's dependent samples *t*-test yielded a statistically significant difference in the percentage of students in poverty taking advanced coursework and the percentage of all students completing advanced coursework, $z = 25.20$, $p < .001$.The Cohen's *d* (Cohen, 1988) effect size was 0.17, below small. Students in poverty maintained a statistically significant lower participation rate than all students at 3.35%. Presented in Table2are the descriptive statistics for this school year's results.

Table 2: Descriptive Statistics for Percent of Students Taking Advanced Coursework for the 2014-2015 School Year

Student Group	*n* of schools	*M%*	*SD*
Students in Poverty	1,738	12.41	18.55
All Students	1738	15.76	19.98

For the third research question, the Wilcoxon's dependent samples *t*-test yielded a statistically significant difference in the percentage of students in poverty scoring above criterion from the percentage of all students scoring above for the 2013-2014 school year, $z = 10.83$, $p < .001$. The effect size associated with this difference, Cohen's *d* (Cohen, 1988), was below small at 0.15.Students in poverty had above criterion score percentages of 38.36% in advanced coursework, and all students had above criterion score percentages of 41.84%, a difference of3.48%. Table 3 contains the descriptive statistics for above criterion student percentages for the 2013-2014 school year.

Table 3: Descriptive Statistics for Percent of Students Scoring Above Criterion in Advanced Coursework for the 2013-2014 School Year

Student Group	*n* of schools	*M%*	*SD*
Students in Poverty	795	38.36	23.36
All Students	795	41.84	23.69

For the 2014-2015 school year, the Wilcoxon's dependent samples *t*-test also yielded a statistically significant difference in the percentage of students in poverty scoring above criterion and the percentage of all students scoring above criterion, $z = 12.76$, $p < .001$. Cohen's *d* (Cohen, 1988) indicated a below small effect size at 0.16. Students in poverty had above criterion score percentages of 36.06%. The above criterion percentage for all students was 39.85%. 3.79% lower than the percentages of all students for advanced coursework. Contained in Table4are the descriptive statistics for above criterion student percentages for the 2014-2015 school year.

Table 4: Descriptive Statistics for Percent of Students Scoring Above Criterion in Advanced Coursework for the 2014-2015 School Year

Student Group	*n* of schools	*M%*	*SD*
Students in Poverty	834	36.06	23.08
All Students	834	39.85	23.64

VIII. Discussion

In this investigation, the extent the percentage of students in poverty differed from all students in the rate of completing advanced coursework and in the percent scoring above criterion were examined. Student economic status was related to statistically significant differences in both the percent of students who took advanced coursework and in the percent of students who scored above criterion on advanced coursework examinations. These findings were consistent with earlier discussed research results (Klugman, 2013; Welton & Williams, 2014), regarding the disparity in course taking and examination performance rates in advanced coursework for students in poverty, as compared to students not in poverty. "Students in high

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poverty high schools generally have …limited access to a rigorous college preparatory curriculum such as Advanced Placement,…and are less likely to matriculate to any form of postsecondary education" (Welton & Williams, 2014, p. 183).

Readers should note that the effect size related to each research question was below small, ranging from 0.15 to 0.19. Moreover, the median difference between students in poverty and all students was less than 4% for students taking advanced coursework and for students scoring above criterion in advanced coursework for both research years. These less than expected results raised questions regarding the research questions and the research design. What factors associated with this study had such an effect on the study's findings?

Additionally, the previously mentioned median percentages prompted further reflection on the low number of students in Texas taking advanced coursework. Given the strength of advocacy for students to enroll in advanced coursework, and the benefits of advanced coursework afforded Texas students, such as college credit and advanced academic status at state colleges and universities (Texas Education Agency, 2016),the overall small student percentages were surprising. A conclusion could be that Texas campus leadership was not advocating advanced coursework, regardless of economics statues, to the degree presumed. The rhetoric from school district offices could be outpacing practices on individual high school campuses.

Related to the research questions, only two years of data were analyzed in this study. Logic could prompt speculation surrounding what differences, if any, would exist if the data from additional years were included in the study? The use of a longitudinal trend study encompassing three to five years could produce study results more in line with expectations (Johnson & Christensen, 2014).

Additionally, the study questions involved students in poverty as compared to all students. A more salient paring of questions would have compared students who are economically disadvantaged with students who are not economically disadvantaged. Unfortunately, the data-reporting mechanisms of the Texas Academic Performance Reports did not allow for the disaggregation of data in this manner. Should such a comparative study be designed, it could be determined that a much greater effect size for economic status did exist. Within this current study, the category of all students included students who are and who are not economically disadvantaged. The inclusion of students who are economically disadvantaged in this variable inherently diminished the effect size of economic status on the dependent variables of participation and performance in advanced coursework.

Therefore, readers are cautioned concerning the generalizability of these findings. Although a large sample size was used, results may not reflect relationships between students in poverty and advanced coursework and assessment in other states. Fellow researchers are also encouraged to explore further the issues related to students who are economically disadvantaged, by examining relationships between economic status and other demographic components such as gender and race/ethnicity. Further research on the influence of poverty on student college-readiness from perspectives other than aggregated campus data are also encouraged.

However, given the study findings, how valid was the traditional recommendation that disparities in college-readiness for students in poverty is most effectively addressed by placing students in advanced coursework and having those students take the related course examinations? Contrary to prior conclusions, other researchers (e.g., Nunley, Shartle-Gatollo, & Smith, 2000; Sparks, 2015) have brought this conventional practice into question. Nunley et al. (2000) reported colleges and universities, nationwide, are witnessing a growing trend in the lack of student readiness for college-level work, even among those students who complete high school advanced-level courses. Sparks (2015) called the effectiveness of the International Baccalaureate Diploma Program into question by noting International Baccalaureate students in poverty were still less likely to go on to college at rates compared to students not in poverty. Sparks (2015) went on to advocate for more access and support for students in poverty to participate and succeed in the International Baccalaureate Diploma Program. Additionally, Sadler and Tai (2007) determined only low correlations were present between Advanced Placement course examination scores and college grades.

Also participating in the discussion, Klopfenstein and Thomas (2009) concentrated their research on Texas high school graduates who matriculated at a Texas public university. Examining the grades of former Advanced Placement students, the researchers concluded Advanced Placement study had a minimal effect on student college success. Further, they questioned the validity of the College Board's claim regarding the efficacy of Advanced Placement course completion and challenged colleges and universities to stop using Advanced Placement course-taking when making admission decisions. In 2013, the University of North Carolina–Chapel Hill entered the emerging debate on the validly of Advanced Placement results, having established no direct correlation between the number of advanced-level high school courses taken and a student's college GPA (Kretchmar & Farmer, 2013). Surprisingly, the university recommended a revision to the weight advanced-level coursework held when determining university admission.

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Therefore, if economic disparity in academic participation, performance, and college-readiness exists, and if a healthy supply of advanced coursework options is not the answer, what hope is there for almost half of the nation's students? Klug man (2013), Plucker et al. (2015), and Welton and Williams (2014) suggested a multi-faceted approach to the challenge. They proposed a variety of programs, initiatives, and supports to ensure students in poverty are provided with equity.

Klug man (2013) made several recommend-dations including reframing the importance of Advanced Placement and the International Baccalaureate in determining college admissions, focusing on developing quality teachers for all classrooms, and increasing academic rigor in instruction before high school. Welton and Williams (2014) called for guaranteeing students in poverty appropriate social supports they would need within a high school's college-ready culture. These supports included family involvement, faculty advocacy, access to college information, and opportunities to participate in college-high school partnerships. Speaking for the Jack Kent Cooke Foundation, Plucker et al. (2015) recommended the development of high school structures to allow students, especially high-ability ones, to move through coursework at their own pace and be supportively monitored as they advanced. Additionally, Plucker et al. (2015) suggested students in poverty have access to a variety of student academic services and their teachers and administrators are fully trained in understanding student needs and how to help meet those needs and how to help students access services.

IX. Conclusion

In conclusion, in the spring of 2013 educators and education scholars from around the globe met for the annual meeting of the American Educational Research Association. The theme that year was – Can schools provide children a way out of poverty? Almost half a century after President Johnson declared war on poverty, the search for the cure to what ails us most, poverty, is still underway.

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