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Differences in Student Participation and Performance in Advanced Coursework as a Function of Economic Status Robert R. Michaels-Johnson¹ and John R. Slate² ¹ Sam Houston State University Received: 13 February 2017 Accepted: 1 March 2017 Published: 15 March 2017

7 Abstract

19

Examined in this investigation was the relationship of student economic status with the 8 completion of advanced coursework for Texas high school students in the 2013-2014 and 9 2014-2015 school years. Also analyzed was the relationship of student economic status with 10 scoring above the state-specified criterion on advanced coursework examinations for the same 11 school years. Using statewide data on all Texas high schools available from the Texas 12 Academic Performance Reports, inferential statistical procedures revealed the presence of 13 statistically significant differences. The percentage of students in poverty who completed 14 advanced coursework in both school years was statistically significantly lower than all Texas 15 students who completed advanced coursework. Similarly, fewer students in poverty scored 16 above criterion on advanced coursework examinations. Implications of the findings were 17 provided, along with suggestions for further research. 18

Index terms— economically disadvantaged, students in poverty, advanced coursework, advanced placement,
 international baccalaureate, college readiness

²² 1 Introduction

n 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).

36 Although policy leaders agree establishing parity between those students who are economically disadvantaged 37 and those students who are not in poverty has been a fundamental goal of educational reform and legislative 38 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 39 poverty who start eighth grade finish high school, 23% of students in poverty who start high school are prepared 40 for a postsecondary level of academic work, and 17% of students in poverty ultimately earn any type of academic 41 degree. This last statistic was in comparison to 57% of higher-income students who eventually complete a degree. 42 Klug man (2013) commented, "In the United States, inequalities in opportunities to learn high-level curricular 43

44 content are stark reminders that equality of educational opportunity has yet to be achieved" (p. 2).

4 STATEMENT OF THE PROBLEM

The consequence of this persistent inequity has been a slow unraveling of the American social fabric. 45 Essentially, half of America's students, an estimate of the number of students in poverty, are ill-equipped for 46 either the workforce or for postsecondary educational opportunities (Reardon, 2013). As family income becomes 47 the best predictor of a student's success in school, "the inadequacy of educational policies for such a large group 48 49 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 50 plight of its students in poverty but has instead become an unwitting accessory to the country's growing income 51 inequality (Reardon, 2013). 52

However, this conundrum has not gone unaddressed by either the educational establishment, or by those 53 persons who champion for the rights and benefits of persons who are economically disadvantaged. The No Child 54 Left Behind legislation was established to address educational inequities in its various forms, including economic 55 disparities (Welton & Williams, 2014). Discussing the specific steps taken in Texas, Welton and Williams (2014) 56 critiqued the state's accountability system in light of its efforts to address the academic and college-ready needs 57 of students in poverty. They determined, although initially designed to ensure students were ready for college 58 or career, highstakes tests undermined that purpose. Instead, because teachers lowered academic standards to 59 60 concentrate on test-preparation, student achievement and college readiness declined. Welton and Williams (2014) 61 concluded, "high school policies, especially in undersourced and low-performing high schools, limit the academic 62 preparation necessary for college because the pressure to meet tough accountability sanctions shifts the schoolwide instructional focus to exit exam preparation" (p. 183). Additionally, they observed, despite recent greater 63 flexibility in the federal accountability system, Texas continued to administer a test-based accountability system 64 that, "de-emphasized college rigor and readiness" (p. 182). 65 Consequently The International Baccalaureate Organization substantiated its claim by declaring all Interna-66

tional Baccalaureate graduates, including students in poverty, are admitted and attend college at similar rates (Gordon et al., 2015).

⁶⁹ 2 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 lowincome 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

90 Baccalaureate students were college ready.

91 **3 II.**

92 4 Statement of the Problem

Historically, students in poverty have encountered fewer opportunities to access postsecondary educational options 93 (Welton & Williams, 2014) than their more privileged peers. One way their choices have been curtailed has been 94 through the number and quality of high school advanced coursework offerings available to students in poverty. 95 In an effort to increase these course options for students in poverty, many school districts have been encouraged 96 97 and have taken steps to implement programs designed to encourage individual school campuses to provide more 98 advanced coursework options to all students, including Advanced Placement and International Baccalaureate 99 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. 100 Consequently, postsecondary education opportunities for these students is limited (Plucker et al., 2015). Citing a 101 lack of financial resources to provide for teacher training and student interventions, educational leaders continue 102 to grapple with determining effective means to equalize student access to advanced coursework and to close the 103

¹⁰⁴ performance gap preventing students from being college-ready (Klugman, 2013).

III. 5 105

Purpose of the Study 6 106

Despite efforts to close these performance gaps, students in poverty access advanced coursework at statistically 107 significantly lower rates than the general student population (Plucker et al., 2015). Relatedly, if enrolled 108 in advanced coursework, students in poverty tend to perform less successfully than their peers who are not 109 poor (Welton & Williams, 2014). The purpose of this study was to determine, by examining Texas Academic 110 Performance Reports data, if these disparities in advanced coursework enrollment and performance existed in 111 Texas, and, if so, the extent to which they were present. 112 IV.

113

Significance of the Study 7 114

Results from this investigation will add to the already existing body of research on the relationship between 115 student economic status and student academic achievement. More specifically, the findings of this study could be 116 used to highlight the disparity in the levels of college readiness for students in poverty as compared to students 117 not in poverty. Additionally, investigative findings and the associated discussion could assist individual campuses, 118 as well policymakers, in identifying and justifying efforts to narrow the achievement and college-readiness gaps 119 existing between students in poverty and their peers. 120 \mathbf{V}

121

Research Questions 8 122

The following research questions were addressed in this investigation: (a) What is the effect of economic status 123 on the percent of students taking advanced coursework in Texas high schools in the 2013-2014 school year?; 124 (b) What is the effect of economic status on the percent of students taking advanced coursework in Texas high 125 schools in the 2014-2015 school year?; (c) What is the effect of economic status on the percent of students scoring 126 above criterion in advanced coursework in Texas high schools in the 2013-2014 school year?; and (d) What is 127 the effect of economic status on the percent of students scoring above criterion in advanced coursework in Texas 128 high schools in the 2014-2015 school year? VI. 129

9 Method a) Research Design 130

A causal-comparative research design was used in this study. In causal-comparative research, attempts are 131 made to determine the cause of differences already existing between groups (Creswell, 2014). Analyzed in this 132 133 investigation were archival data taken from the Texas Education Agency's Texas Academic Performance Reports 134 to determine the effect of economic status on the enrollment and performance of high school students in advanced

coursework. 135

b) Participants and Instrumentation 10 136

Aggregated campus-level data were obtained from the Texas Academic Performance Reports of the Texas 137 Education Agency for the 2013-2014 and 2014-2015 school years. Initially obtained as an Excel spreadsheet 138 document, the data were imported into the Statistical Package for Social Sciences (SPSS) software program. 139 The data, as reported by school districts to the Texas Education Agency, were assumed to be accurate. This 140 assumption was made because of the data audits routinely conducted by the Texas Education Agency. 141

c) Definition of Terms 11 142

As the data for this investigation were obtained from the Texas Education Agency and involved the participation 143 and performance of Texas high school students, an understanding of the terms associated with this study as 144 they were defined by the Texas Education Agency, was necessary. Economically Disadvantaged referred to the 145 count and percentage of students eligible for free or reduced-price lunch or eligible for other public assistance 146 147 (Texas Education Agency, 2016). Advanced coursework completion equaled the percentage of annual graduates 148 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 149 was also referenced as advanced coursework completion. To be above criterion on the associated advanced 150 coursework assessments, students must have been awarded a minimum score of 3 out of 5 on an Advanced 151 Placement examination, or a minimum score of 4 out of 7 on an International Baccalaureate examination (Texas 152 Education Agency, 2016). 153

154 **12** VII.

155 **13** 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 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 172 between the percentage of students in poverty and all students completing advanced coursework in the 2013-2014 173 174 school year, z = 25.42, p< .001. The effect size associated with these differences was below small, Cohen's d of 175 0.19 (Cohen, 1988). Students in poverty had statistically significantly lower participation rates than all students 176 at 3.50%. Descriptive statistics for this analysis are presented in Table 1. For the 2014-2015 school year, the 177 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 =178 25.20, p< .001. The Cohen's d (Cohen, 1988) effect size was 0.17, below small. Students in poverty maintained a 179 statistically significant lower participation rate than all students at 3.35%. Presented in Table2are the descriptive 180 statistics for this school year's results. For the third research question, the Wilcoxon's dependent samples t-test 181 yielded a statistically significant difference in the percentage of students in poverty scoring above criterion from 182 the percentage of all students scoring above for the 2013-2014 school year, z = 10.83, p < .001. The effect 183 size associated with this difference, Cohen's d (Cohen, 1988), was below small at 0.15. Students in poverty had 184 above criterion score percentages of 38.36% in advanced coursework, and all students had above criterion score 185 percentages of 41.84%, a difference of 3.48%. Table 3 contains the descriptive statistics for above criterion student 186 percentages for the 2013-2014 school year. For the 2014-2015 school year, the Wilcoxon's dependent samples t-test 187 also yielded a statistically significant difference in the percentage of students in poverty scoring above criterion 188 and the percentage of all students scoring above criterion, z = 12.76, p<.001. Cohen's d (Cohen, 1988) indicated 189 a below small effect size at 0.16. Students in poverty had above criterion score percentages of 36.06%. The above 190 criterion percentage for all students was 39.85%. 3.79% lower than the percentages of all students for advanced 191 coursework. Contained in Table4are the descriptive statistics for above criterion student percentages for the 192 2014-2015 school year. 193

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¹⁹⁵ 15 Discussion

In this investigation, the extent the percentage of students in poverty differed from all students in the rate of 196 completing advanced coursework and in the percent scoring above criterion were examined. Student economic 197 status was related to statistically significant differences in both the percent of students who took advanced 198 coursework and in the percent of students who scored above criterion on advanced coursework examinations. 199 These findings were consistent with earlier discussed research results (Klugman, 2013; Welton & Williams, 2014), 200 regarding the disparity in course taking and examination performance rates in advanced coursework for students 201 in poverty, as compared to students not in poverty. "Students in high poverty high schools generally have ?limited 202 access to a rigorous college preparatory curriculum such as Advanced Placement,?and are less likely to matriculate 203 to any form of postsecondary education" ??Welton & Williams, 2014, p. 183). 204

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 221 paring of questions would have compared students who are economically disadvantaged with students who are not 222 economically disadvantaged. Unfortunately, the data-reporting mechanisms of the Texas Academic Performance 223 Reports did not allow for the disaggregation of data in this manner. Should such a comparative study be designed, 224 it could be determined that a much greater effect size for economic status did exist. Within this current study, the 225 category of all students included students who are and who are not economically disadvantaged. The inclusion 226 of students who are economically disadvantaged in this variable inherently diminished the effect size of economic 227 status on the dependent variables of participation and performance in advanced coursework. 228

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 collegereadiness from perspectives other than aggregated campus data are also encouraged.

However, given the study findings, how valid was the traditional recommendation that disparities in collegereadiness 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., ??unley (Kretchmar & Farmer, 2013). Surprisingly, the university recommended a revision to the weight advanced-level coursework held when determining university admission.

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 recommendations including reframing the importance of Advanced Placement 245 and the International Baccalaureate in determining college admissions, focusing on developing quality teachers 246 for all classrooms, and increasing academic rigor in instruction before high school. Welton and Williams (2014) 247 called for guaranteeing students in poverty appropriate social supports they would need within a high school's 248 college-ready culture. These supports included involvement, faculty advocacy, access to college information, and 249 opportunities to participate in college-high school partnerships. Speaking for the Jack Kent Cooke Foundation, 250 Plucker et al. (2015) recommended the development of high school structures to allow students, especially 251 highability ones, to move through coursework at their own pace and be supportively monitored as they advanced. 252 Additionally, Plucker et al. (2015) suggested students in poverty have access to a variety of student academic 253 services and their teachers and administrators are fully trained in understanding student needs and how to help 254 meet those needs and how to help students access services. 255

²⁵⁶ 16 IX.

257 17 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.

1

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

Figure 1: Table 1 :

 $\mathbf{2}$

3

Student Group	n of schools	M%	SD
Students in Poverty	1,738	12.41 18.55	
All Students	1738	15.76 19.98	
Figu	re 2: Table 2 :		
Student Group	n of schools	M%	SD
Students in Poverty	795	38.36	23.36
All Students	795	41.84	23.69

Figure 3: Table 3 :

 $\mathbf{4}$

Student Group	n of schools	${ m M}\%$	SD
Students in Poverty	834	$36.06 \ 23.08$	
All Students	834	$39.85 \ 23.64$	
VIII.			

Figure 4: Table 4 :

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