

## **Understanding the Impact of Race, Socioeconomic Status on Student Achievement for Secondary School Students**

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### **Abstract**

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*Plenty of studies focused on race, gender, and academic outcome, but few examine the relationship to academic performance between socioeconomic status and ethnicity. Socioeconomic status and racial groups become one of the most widely used contextual variables in education research; however, not all researchers reinforce how they influence the high school students' academic outcome. This empirical research examined the correlation between socioeconomic status and racial groups with students' academic performance and how the socioeconomic and racial factors impact students' learning outcomes. The descriptive statistic and two-way independent factorial variance of ANOVA were employed to analyze the 600 samplings to measure the effect and relationship between socioeconomic and racial variables. Findings discovered that the upper socioeconomic status has a higher impact than the lower and middle groups. The racial groups of White and Asians have better academic outcomes than Black and Hispanics. Future research would be recommended.*

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**Keywords:** socioeconomic, race, ethnicity, correlation, ANOVA, secondary school

### **Introduction**

Over the last decade, there are plenty of studies focusing on race, gender, and academic outcome. Still, few of them examine the relationship to academic performance between socioeconomic status and ethnicity (Berger & Archer, 2015). This lack of attention has consistently been linked with student academic performance in many countries (Sirin, 2005). Although many studies focus on academic achievement research, few studies explored the relationship between socioeconomic status (SES) and academic achievement (Asiegbu & Ezeugbor, 2018).

Socioeconomic status (SES) might be one of the most widely used contextual variables in education researchers; however, not all researchers might reinforce how the SES influences the high school students' academic outcome (Sirin, 2005). White (1982) stated that there was a statistically significant between SES and academic performance through his meta-analysis studies and pointed out that many SES factors influence students' academic achievement.

Subsequently, many new empirical studies have explored the same relation and considered different SES indicators such as family income, parents' education background and occupation, neighborhood, perception, and other factors influencing the students' academic performance. Therefore, socioeconomic status is directly linked to academic achievement and indirectly related to other indicators of SES, such as students' racial, and school location (White,1982; Suleman et al., 2012).

Bradley & Corwyn (2002) found that low SES has a correlative relationship with academic outcomes. In their several international studies, Bradley & Corwyn (2002) concluded that the SES indicators affect students' performance, language proficiency, educational attainment (Sirin, 2005), and school attendance. Berger & Archer (2016) found that only 72% of students from the lowest SES areas complete secondary schooling compared to 91% of students from the highest SES background through the conceptual meaning and empirical measurement studies. Therefore, socioeconomic status becomes a critical factor in the academic achievement of society. Reviewed the previous studies, Berger & Archer (2016) used a t-test, bivariate correlation test for the total participants of 130 students, the mean of age was 16.5,  $t(126)=4.13$  to find out that there is a significant effect between socioeconomic status and academic achievement. Sirin (2005) found that socioeconomic status had a slight decrease in correlation with academic achievement. The sampling of his study had 101,157 students from 6,871 schools in 128 school districts. However, White (1982) concluded that socioeconomic status strongly correlated with students' academic outcomes through his meta-analysis studies.

Therefore, the study aims to look at the effects of socioeconomic status and racial differences on students' academic performance of reading test scores with the following questions addressed.

1. Is there a statistically significant relationship on the student's reading performance by socioeconomic status and ethnicity groups?
2. Is there a statistic main effect between A and factor B in the study?
3. Is there a statistic interaction between factor A and factor B in the study?

In an analysis of variance, the study has two factors of socioeconomic status with three levels, and the racial group has four levels. The researchers developed the following scientific hypotheses to engage the objectives of the study.

1. There is a significant interaction or relationship between two factors on academic performance tests in the study.
2. There is a significant main effect between the two factors in the study.
3. There is a simple effect between the two factors in the study.
4. There is no effect or a significant relationship between the two factors in the study.

## **Methods**

### **Participants and Design**

A primary concern for random participant selection was ensuring the representation of diverse socioeconomic backgrounds with various ethnicities. In the study, the original data was taken from the High School & Beyond in the United States with a total of 600 hundred high school students, age ranging from 15 years old to 18 years old nationwide. The socioeconomic status covers low (23.2%), middle (49.8%), and upper class (27%) of the total population and the racial varieties include White (72.8%), Black (9.7%), Hispanic (11.8%), and Asian (5.7%) of the total participants. With careful consideration, all the participants have shown the different performance of reading ( $M=51.90$ ,  $SD=10.10$ ). Correctly, the comparison on academic performance by socioeconomic status shows that the better economic condition has a better educational outcome, and race shows that White and Asians perform better than Black and Hispanic groups usually shown in table 1.

**Table 1**

*Mean and Standard Deviation on Academic Performance of Reading Score by Race and Socioeconomic Status (SES)*

	Reading			%
	N	M	SD	
<b>Race</b>				
White	437	53.35	9.8	72.8
Black	58	47.06	9.3	9.7
Hispanic	71	45.93	8.9	11.8
Asian	34	54.06	9.8	5.7
Total	600			
<b>SES</b>				
Lower	139	47.34	9.1	23.2
Middle	299	51.93	9.8	49.8
Upper	162	55.78	9.8	27
Total	600			

Understanding the impact on high school student academic performance of the study is a 3 (SES: Lower, Middle, Upper) by 4 (Race: White, Black, Asian, Hispanic) factorial design was conducted to evaluate the mean academic scores effects between different race and socioeconomic status. The study also predicts a statistically significant impact, or there has no interaction or no equal at any of them.

**Measurements and Analysis**

In the study, the independent variables have socioeconomic status with three levels of the lower, middle, and upper, and ethnicity with four groups of White, Black, Hispanics, and Asian. The dependent variables consider academic standardized test performance with the output of reading. The school's research staff recorded all students' academic test results for each time of the test. For the educational benefits of the high school students, analyzing the dataset, an instructional guide to the assignment was handed out. All student's academic data was compiled following the four years, and the researcher SES coded the data has three levels which are 1=lower, 2=middle, and 3=upper; and race has coded by 1=Hispanic, 2=Asian, 3=Black, and 4=White in the data analysis. The study will use contrast coefficients (high=1,-1,0; low=-1,0,-1; no=0,1,+1) to plan the comparisons of contrast estimate size for the race are 63, and SES are 179; p-value is less than .001 and the post-hoc test of Tukey-Kramer HSD both for factor A of the p-value is less than .001, and factor B is less than .05. Also, the study will use the power analysis to predict the relationship between power, effect size, sample size, and alpha in the survey.

The descriptive statistic will use to mean differences in student's academic outcomes between race and socioeconomic status and predict why they differ. The three by four factorial ANOVA will see whether there is an interaction or educational means differences by racial groups and socioeconomic status in the study.

**Results**

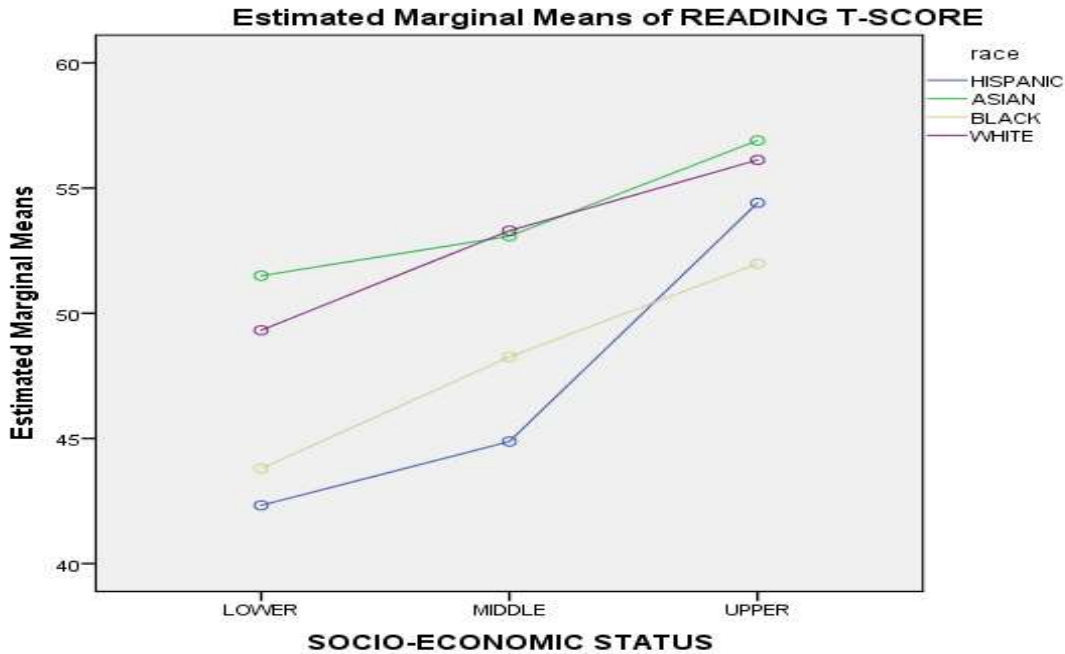
The results of this study will describe below.

**Q1: Is there a statistically significant relationship on students' reading performance by socioeconomic status and ethnicity groups?**

The three by four factorial of ANOVA was conducted to evaluate the mean reading scores between different ethnic groups and socioeconomic status to test whether there is a statistically significant interaction of the academic reading performance between ethnicity and socioeconomic status, shown in figure 1 below.

Figure 1

Academic Reading Performance by Ethnicity and Socioeconomic Status



The figure 1 shows that the White (  $M= 53.35, SD=9.8$  ) and Asian ( $M=54.06, SD=8.9$ ) groups have better academic mean scores than the Black( $M=47.06, SD=9.3$ ) and Hispanics ( $M=45.93, SD=9.8$ ), which indicated that White and Asian assume to have a better economic condition, and the middle class between Asian and White have interacted and the Hispanic and Black have interacted. The test for the normality of Shapiro-Will for all economic status is significant because the p-value is less than the alpha p-value of .05. However, the racial groups of Hispanics and White are substantial, but the Asian and Black might not be significant because their p-values are more than the alpha p-value of .05 in the study. Generally, they are typically distributed. The homogeneity of variance was not substantial, Levene  $F(11,588) = 1.558, p=.107$ , and it means that this assumption of the study was met, and an alpha level of .05 was initially used.

The results of the ANOVA test shows that there are statistically significant relationships between socioeconomic status (SES) and high school students' reading performance, due to the value of  $F(2,588) = 12.45, p<.001$ , partial Eta squared is .041. The racial group correlated with the academic performance due to the  $F(3,588) = 9.89, p<.001$ , partial Eta squared is .048. However, the socioeconomic status with a racial group based on  $F(6,588) = .825, p=.551 (>.05)$ , partial Eta squared is .008 shows a main effect in the study. Finally, according to the Post Hoc Test of both Tukey HSD and Bonferroni shows that the socioeconomic status with reading performance has a significant relationship because of the p-values among the lower, middle, and upper is less than the alpha of p-value. However, the Post Hoc Test of both Tukey HSD and Bonferroni shows that there are significant relationships between Hispanic and Asian, between Hispanic and White, between Asian and White, between Black and White, between Black and Asian on students' academic reading performance.

**Q2: Is there a statistic main effect for factor A and factor B in the study?**

The table 2 below of the two independent factorial analysis of ANOVA shows that the main effect of student race on academic reading performance was not significant ( $F(6,588)=.83, p=.55$ ), partial Eta squared is .008. Still, the main effect of the race ( $F(3,588)=9.89, P=.000$ ) and socioeconomic status ( $F(2,588)=12.45, p=.000$ ) on academic reading performance was significant. For example, the upper socioeconomic status has better academic performance, and vice versa, as the results of the study show that the Asian( $M=53.82, SD=1.66, 95\% CI(50.58,57.08)$ ) has higher academic reading performance than White( $M=52.91, SD=.49, 95\% CI(51.96,53.87)$ ). However, the Hispanic ( $M=47.20, SD=1.19, 95\% CI(44.87,49.54)$ ) is the lowest academic performance on reading test scores and Black ( $M=48.01, SD=1.34, 95\% CI(45.38, 50.65)$ ) is less than White.

**Table 2**

*Two-way Analysis of Variance for Academic Reading Performance between Racial Groups and Socioeconomic Status*

Source	SS	df	MS	F	P
Race	2614.33	3	871.44	9.89	.000
SES	2193.76	2	1096.88	12.45	.000
Race * SES	436.25	6	72.71	.83	.55
Within (Error)	51804.72	588	88.10		
Total	1677420.27	600			

The results of the post hoc test of Bonferroni pairwise comparison show that the reading performance test of the racial group was a significant difference,  $M_{diff}=-6.623$ , 95% CI (-12.017,-1.229),  $P=.007$  between Hispanic and Asian;  $M_{diff}=-5.711$ , 95% CI (-9.111, -2.310),  $P=.000$  between Hispanic and White;  $M_{diff}=5.813$ , 95% CI (.177, 11.450),  $P=.039$  between Asian and Black; and  $M_{diff}=4.901$ , 95% CI (1.127, 8.675),  $P=.004$ . However, there is no main significant difference between Asians and White; between Black and Hispanics ( $p=1.0$ ). Additionally, the reading performance test of socioeconomic status was a significant difference,  $M_{diff}=-8.115$ , 95% CI (-12.038, -4.193),  $P=.000$  between lower and upper;  $M_{diff}=-4.975$ , 95% CI (-8.580, -1.369),  $P=.003$  between middle and upper.

### **Q3: Is there a statistic interaction between factor A and factor B in the study?**

There was a significant interaction between students' socioeconomic status and academic reading test performance,  $F(2, 588) = 12.45$ ,  $p=.000$ . There also has an interaction between racial groups and academic performance,  $F(3,588) = 9.89$ ,  $p=.000$  in the univariate tests. In other words, the higher socioeconomic status expects to have a higher theoretical result and favorable racial groups. The post hoc test of homogeneous Tukey shows that the socioeconomic status among lower, middle and upper has a significant effect; however, the homogenous Tukey indicates that the Hispanic has a similar condition with Black and the White and Asian. Therefore, the study discovered that there is a statistical interaction between the two factors in the study.

To test with the planned contrast coefficient on academic reading assumed that  $t(600)=-4.62$ ,  $Std=.99$  for SES upper;  $t(600)=-92.24$ ,  $Std=1.11$  for SES middle, and the lower SES with  $t=114.18$ ,  $Std=.943$ ,  $p<.001$ , and Welch  $F(2,322)=29.89$ ,  $p<.001$ ,  $ES=179$ . Meanwhile, the post hoc test of Tukey HSD shows all of them are significant effects. This analysis correlated with the planned design. Also, the contrast coefficient on academic reading for the racial group is significant (Welch  $F(3,96.55) = 17.66$ ,  $p<.001$ ,  $ES=63$ , except no significant difference between Hispanic and Black, between Asian and White correlated with this study by the results of Tukey. Aside from the contrast coefficient, a-priori power analysis assumed 12 groups in the study. The total sample size is 340 participants; however, the current HSB data has 600 hundred larger sampling. Briefly, this study can conclude that there are relationships and effects on academic reading performance between ethnicity and socioeconomic status.

### **Conclusions and Limitations**

The current study correlates with the previous studies indicating a significant academic performance on reading between socioeconomic status and racial groups. This study found the same results as White (1982), stated that there is a meaningful relationship between socioeconomic status and academic performance results. However, the current study found that there is no significant difference between Black and Hispanic and White and Asian on their academic performance. Notably, the study continuously supports the previous results of their studies (Sirin, 2005; Berger & Archer, 2016) that there was a significant effect between the two factors. Also, the study found that better socioeconomic condition shows better academic performance and vice versa (White,1982).

However, the present study may consider several limitations. Firstly, if the author could collect the first raw data based on a preliminary power analysis, the review might be useful. Secondly, if the author could explore the multivariate and regression to measure the effect among SES, gender, self-concept, emotion, and type of school the students choose, the study might be useful. Therefore, future research could focus on the relationship of a standardized academic test of reading, writing, science, mathematics, and civic study between SES, Gender, emotion, and school choice.

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