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Influence of Physical Activity, SES`, Perceived Safety, and Demographic Factors on the GPA of Asian American Students: Report of the National High School Longitudinal Study

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Abstract

Physical Activity is an important contributor to health, both physical and cognitive. Relationships among students' physical activity (PA), sports participation, physical health status, and academic performance have been explored in various academic venues, however, investigating Asian American students nationwide has not yet been covered. Using the latest National High School Longitudinal Study data and the hierarchical regression approach analyzed, this study examined: How the extracurricular PAs, school attitudes, and other demographic variables impact the participants' personal health, and grade point average (GPA). Participants were 956 Asian American high-school students (AAHSSs). Findings confirmed the importance of participating in PA and identified the relationships between the relative factors. In brief, AAHSSs who participated in after-school PA (including sports) earned a higher GPA. No significant impact on GPA from the AAHSSs' hours spent on extracurricular activities. Female AAHSSs had a higher GPA than their male counterparts. AAHSSs' socioeconomic status significantly impacted their educational achievement. Why the way of distributing social resources to all American students is the key to having equal educational opportunities was revealed and explained because the equal distribution of social resources influences educational achievement. Meaningful recommendations are offered to parents, community leaders, teachers, school administrators, and policymakers as well.

Introduction

Regularly participating in physical activity (PA) generates benefits for personal health, functional ability, and general quality of life became an unarguable fact and accepted by the public society (Powell & Pratt, 1996). In contrast, physical inactivity has become a major public health problem in most developed countries and has been recognized as a worldwide epidemic (Chief Medical Officer, 2004). This situation may become even worse because research studies have predicted that: within the next two decades, the rate of childhood obesity in the United States will reach 40% or higher (Kopelman, 200). Researchers also predicted that by the year 2040, Type 2 diabetes will affect 300 million people globally (Zimmet, 2003). Therefore, educating young people on the benefits of PA, and facilitating opportunities for participation have become extremely meaningful tasks in the

challenges of developing a healthier next generation. According to Sallis and Owen (1999), PA is defined as "any bodily movement produced by skeletal muscles that result in energy expenditure" (p. 1); this definition is generally accepted and recognized by the public.

Moreover, regularly participating in Physical Activity has been verified as an effective strategy to improve and keep personal health. The PA Guidelines for America are a critical resource for health professionals and policymakers that provide recommendations on how youth can improve their health through regularly participating in physical activity (Office of Disease Prevention and Health Promotion, 2018). Castelli et al. (2015) stated "Because children spend so much time at school, schools have a unique opportunity to help children become healthier and more active." (p. 1). The Institute of Medicine has called on school leaders to offer more opportunities for children to be physically active before, during, and after school (Castelli et al. 2015). It is important to note that childhood obesity and poor academic performance in schools are highly associated with lower-income and minority-status, segments of the population, which bear an unequal burden of poor health indices (Castelli et al. 2015).

To accomplish the goal of regular PA participation by Asian American students' educators, administrators, parents, and legislation must work together. Specifically, this task requires that these stakeholders identify the factors that Asian American students to participate in, or not participate in PA. Hence, conducting this investigation appears to be very important and necessary. The objectives of this study were to examine those contributing factors to Asian American high school students "Physical activity participation" including Perception of school safety, Socioeconomic status (SES), and Other demographic factors.

It is important and necessary to explore what the literature had to say about Asian American high school students' PA participation and their academic performance. Hence, the primary literature review and background would cover the Effects of school physical education, Participation in organized sports, The debate on adolescents' PA participation and Academic achievement, and the Relationships between physical activity, Cognitive function, and Academic performance from the previous research. Then, the Theory of Intersectionality, and Studies on academic performances of Asian American high school students would be addressed. Certainly, in the present study, we focus on the relationships between Personal-health, Physical activity participation, and Asian American high school students' Phys-Ed GPA.

Effects of School Physical Education

Coe, Pivarnik, Womack, Reeves, and Malina (2006) examined the effects of physical education, class enrollment, and physical activity on the academic achievement of 214 6th-grade students. 9 Participants were assigned to execute 30-minute blocks of moderate and vigorous physical activity (MVPA), outside of school. Their key finding was that physical education classes averaged only 19 minutes of MVPA. Students who either met some or met all of the "Healthy People 2010 guidelines" for vigorous activity had significantly higher GPAs ($P < .05$) in comparison to students who performed no vigorous activity over two school semesters. They concluded that although academic achievement was not significantly related to physical education class enrollment, a higher GPA

was associated with MVPA; in one word, the higher the activity level, the higher the GPA the participants obtained.

Participation in Organized Sports

According to the Committee on Sports Medicine and Fitness and Committee on School Health (CSMFCSH, 2001), participation in organized sports provides an opportunity for young people to increase their physical activity and develop physical and social skills. However, when the demands and expectations of organized sports exceed the maturity and readiness of the participant(s), the positive aspects of participation can be reduced or invalidated. Meanwhile, the degree of parental support and involvement can also have a huge influence on participation in organized sports of young people (CSMFCSH, 2001). Additionally, the organizations hosting after-school sports programs offer students the opportunity to learn safety rules and use proper equipment and facilities due to the presence of trained coaches/instructors.

The Relationships among the Physical-activity, Cognitive Function, and Academic Performance

Using a very large sample, a longitudinal design, and a cluster-randomized trial methodology, Donnelly and Lambourne (2011) examined the relationship between physical activity, fitness, obesity, cognitive function, and academic achievements in a large sample (not specifically for Asian American students). The impact of classroom-based physical activity on body mass index (BMI) and academic achievement was assessed. Their "Physical Activity Across the Curriculum Intervention Project" also supported the role of physical activity in the classroom. In brief, the participants who received the "Intervention Project" did better in overall performance on a standardized academic test by six percent in comparison to those who did not receive the "Intervention Project". Their BMI also had significant ($p < 0.00$) improvement compared to those students who did not receive the 'Intervention Project'. Although further research studies are needed, their main conclusion was that the physical activity academic lessons provided greater intensity than other physical activity lessons because it was based on the scientific principles of development; therefore, students who participated in the intervention project obtained significant BMI and academic achievement related benefits.

The Debate on Adolescents' Physical-activity Participation and Academic Achievement

Although it is common knowledge that regular participation in physical activity will lead to positive personal health indices and psychological benefits, the relationship between adolescents' physical activity participation and academic achievement, requires additional clarification. Some studies have found little support for a positive relationship between physical activity and academic performance (Donnelly & Lambourne, 2011), while other studies have identified a negative relationship between physical activity participation and academic achievement (Castelli et al. 2015; Coe et al., 2006). However, a greater number of studies have reported positive physical health as well as better cognitive outcomes as a function of regular physical activity participation (e.g., Donnelly &

Lambourne, 2011).

A quantitative systematic literature analysis conducted by Fedewa and Ahn (2011) has clarified the argument. Their review included a total of 59 studies from 1947 to 2009. Results indicated a significant and positive effect of physical activity on adolescents' academic achievement and cognitive outcomes, with aerobic exercise generating the maximum effect. Several variables were also found to have a significant contribution to this relationship. Fedewa and Ahn (2011) also provided strategies to modify school-based policies regarding physical activity to improve children's academic performance. Castelli et al. (2015) indicated that one in three children and adolescents in the US was overweight or obese; this overweight group had a higher risk of experiencing health problems such as heart disease, type 2 diabetes, unhealthy blood cholesterol patterns, and other health problems related to cardiovascular disease. Obesity can also cause serious consequences for children and adolescents' cognitive development and attending any extracurricular activities. Since children spent most of their time in school, schools are of cause a unique place for children to learn and develop knowledge and skills to become more healthy and active people (Castelli et al. 2015).

Several investigators have suggested that multiple factors that influence the health-related effects of physical activity; these factors include SES, perception of neighborhood safety, race, and gender (e.g., Hasson, 2017; Meyer, Castro-Schilo, & Aguilar-Gaxiola, 2012; Stokie, 2009). Hasson (2017) in his article "Addressing Racial/Ethnic Differences in Age-Related Declines in Physical Activity During Adolescence" suggested that there was evidence that showed racial or ethnic differences in school-age adolescent decline among adolescents who regularly participate in physical activity during their school hours.

The Theory of Intersectionality

Over the last three decades, many researchers have investigated gender differences in health (e.g., Beal, 2008; Bermúdez, Stinson, Zak-Hunter, & Abrams, 2011; Kiehne, 2016). Moreover, the theory of Intersectionality (Crenshaw, 1991) identified how race, gender, and class intersected, and created unique experiences for minorities in American society. Specifically, the theory of Intersectionality conveyed and illustrated how oppression occurred among specific races, genders, and social classes. Beal (2008) found that minority women faced Double Jeopardy by being both members of an exploited race, and a 'weaker' gender group. In recent years, investigators have focused on Blacks, Latinx, Asian Americans, and women. For example, Bermúdez et al. (2011) in their study "Mejor Sola Que Mal-Acompañada: Strengths and Challenges of Mexican-Origin Mothers Parenting Alone" examined the importance of recognizing Mexican-Origin feminism and its relevance to Intersectionality theory. The researchers stated that the primary reasons for incorporating Mexican-Origin American feminism into family research are to elucidate the strengths within the Mexican-Origin American community, to highlight women's experiences, and better understand the sources of their empowerment (Bermúdez et al., 2011).

Similarly, the Intersectionality Theory can be applied to other ethnic groups, such as the Asian American community, particularly when incorporating overlapping forms of identity such as race, gender, class, origin, citizenship status, and current geographic location in a multidimensional Approach. Utilizing multidimensional

observations, Beam, Casabianca, and Chen (2011) reported that the quality of education available to Asian Pacific American students in the New York City public schools system is negatively influenced by multiple factors such as the inequitable distribution of teaching resources, large class-sizes, schools shut down, the qualifications and education as levels of educators and administrators, and the serious deficits in the cultural competence of educators and administrators. These factors affect the academic achievement of Asian-Pacific American children and youth, as well as other communities of Color (Beam et al., 2011).

From a different perspective, Kiehne (2016) a researcher indicated that nativism, an aspect of the 'Intersectionality Approach', played a critical role in Asian American communities. However, it is important to understand, that the Intersectionality Approach is born from the lack of attention to gender identity. Brown and Battle (2018) suggested that because the Intersectionality Theory provides a broader theoretical perspective that situates race, class, and gender as a new field of intersection studies it has attracted the attention of many researchers worldwide. Multiple social stratums and social locations are experienced simultaneously and mutually reinforcing, and therefore all things must be considered in tandem rather than independently (Browne & Battle, 2018). These social factors are not always equal but are mutually impactful on one another while serving as the basis for anti-discrimination and low-class life chances (Browne & Battle, 2018). Furthermore, Browne and Battle (2018) pointed out that this theoretical framework provides a powerful tool for analyzing the social, economic, and educational status of various ethnic groups including Asian Americans.

Studies on Asian American High School Students' Academic Performances

There are both similarities and differences in the characteristics of intersectionality among Asian Americans, Black, and Latinx populations. Research studies focused on the Asian American population, however, are far less in number than their Black and Latinx counterparts; hence, the current study would utilize the methodologies and findings from the other two ethnic groups as a guide whenever relative discussion and analyses are needed. Fortunately, a diversity educator and a distinguished researcher from the Education University of Hong Kong conducted a research study, in which he provided a detailed description of how the 'Intersectionality theory' can play to the Asian American communities. In his article "Asian America and Education" Chang (2017) indicated that "The communities that constitute the racialized category of Asian Americans consist of approximately 20 million people in the United States or about 5% of the total population. About 20% or 4 million are of primary or secondary school age, and over 1.1 million are in higher education" (p. 1). These are critical points of view and factors related to the current study. Chang (2017) further described that: "Asian American generally refers to people who have ethnic backgrounds in South Asia (e.g., Bangladesh, India, Pakistan, Sri Lanka), Southeast Asia (e.g., Cambodia, the Philippines, Thailand, Vietnam), and East Asia (e.g., China, Japan, Korea, Taiwan). As Asian American is an umbrella term used to categorize a very diverse, heterogeneous, and transnational set of populations, Asian Americans as a group present various challenges to education and research in and about the United States (p. 1)."

Moreover, concerning the notions of Intersectionality and Transnationalism related to Asian American studies, Chang (2017) indicated, that, "Asian Americans are characterized as "the Model Minority" or "the Oppressed

Minority" persist, the relevance of such static binaries has increasingly been challenged as the Asian American populations and migrations continue to diversify and increase (p. 1)". Based on the above description, conducting an investigation to address on Asian American high school students' issues related to the current topic is extremely necessary. In brief, the present study has the following hypotheses or needs to answer the following questions: (1) whether differences exist in cognitive function between the Asian American high-school students who participated in extracurricular physical activities or not. (2) Whether differences would exist in cognitive function between Asian American high-school students who perceive the school environment to be safe or not? As we presented in the Introduction section, those previous studies have limitations on the size of sampling, duration of the investigation, and data analysis techniques; the present study would overcome these limitations by employing the latest national survey - the High-School Longitudinal Study (HSLS). The HSLS was designed by the National Center for Educational Statistics, a primary federal entity for collecting and analyzing data related to the education status of multiple ethnic groups in the United States. This data set was the largest sample size in the topic of Asian American high-school students' research study by far.

Specifically, the Independent variables or the relative factors in the current study involved 11 meaningful variables; it is counted as the most extensive information collection for this topic ever, and using the OLS Regression technique for determining different Models for the participants in the first attempt in the study of Asian American high school students. In brief, our expectations for this study are able to provide clear findings or statements on the status of Asian American high- school students' sport participation, personal health, and their Phys-Ed GPA; provide meaningful suggestions for helping the policymakers to accept the 'Intersectionality' theory perspective, and to challenge them to enable to develop structural interventions that may have affected on the current racism structure as well as other related factors, and so on.

Methods

Data Collection and Participants

Data for this research was taken from the High School Longitudinal Study (HSLS). It was designed by the National Center for Educational Statistics (NCES), a primary federal entity for collecting and analyzing data related to the current education in the United States Note. The baseline survey was administered to 9th-grade students in 2009, and the sample size included 944 schools with over 23,000 students, and their parents, school counselors, administrators, and teachers. Public, Private, and Catholic schools were all sampled, and 9th grad students were randomly selected within each school. The first follow-ups began in 2012 when the majority of the students would be in the 11th grade. In 2013 high school transcripts were collected. Finally, the second/last follow-up occurred in 2016, which would be indicative for most students of a (3-year) post-secondary education phase, in which many students were either in college, employed, or have never attended college. The Institutional Review Board (IRB) permission to conduct the survey; and the "Inform Consent' form from the participants were administrated by the NCES during the investigation and the three following up.

Physical Education GPA is a variable indicative of a student's grade point average for Personal Health and Physical Education courses. Courses under this terminology include traditional courses such as gym classes that

are largely physical activity-based as well as courses tailored towards physical education such as learning about exercise and nutrition. We simplify the name of this variable as a Phys-Ed GPA. Grade point averages (GPSs) for this variable were reported on a 4.0 scale, with 4.0 being the highest, and 0 being the lowest, however, in this data set the lowest Phys-Ed GPA reported is 0.25.

Independent Variables

According to a review of the most relevant literature on our study topic (e.g., Battle, Alderman-Swain, & Tyner, 2005; Browne & Battle, 2018), the following independent variables were adopted: (1) Participated in Sports is a dummy variable reflecting whether a student participated in organized sports outside of school (1 = yes, 0 = no). (2) Hours Spent on Extracurricular Activities investigates the number of hours a student spends on extracurriculars on a typical school day. (3) Feels Safe at School is a dummy variable that investigates whether a student feels safe in school or not (1 = yes, 0 = no). (4) School Pride is a dummy variable that investigates whether a student is proud to be a part of their school or not (1 = yes, 0 = no). (5) Female is a dummy variable indicating student's gender, (1 = female, 0 = male). (6) Urbanicity is recoded into a series of dummy variables that reflect the schools' urbanicity; Individually included are City (1 for a city, 0 for all else); Town (1 for a town. 0 for all else), and Rural (1 for Rural and 0 for all else), with suburban, being the reference category. (7) South is a dummy variable indicating whether the school's region is in the south or not in the south (1 = south, 0 = not in the south). (8) Socioeconomic Status (SES) is a standardized variable reflecting socioeconomic status, which is a combination of income education, and occupational prestige. (9) Born in the U.S.A. is a dummy variable that investigates whether or not a student is born in the USA or not (1 = Born in the USA, 0 = another country). (10) Two-Parent Household is a dummy variable indicating whether or not a student lives in any kind of two-parent household (1 = any 2-parent configuration, 0 = other).

As stated in the 'Introduction' section, some of the independent variables listed above have been used or adopted by researchers in previous studies, (e.g., Browne & Battle, 2018; Martens et al., 2014; Rothon, Goodwin & Stansfeld, 2012). Other researchers on this particular topic such as Hasson (2017); Meyer, Castro-Schilo, and Aguilar-Gaxiola (2012); and Stokie (2006) have used SES, perception of Neighborhood safety, race, and gender in their studies. Additionally, race, gender, class, origin, citizenship status, and current geographic location were also used in a multidimensional approach by many researchers (e. g., Browne & Battle, 2018; Fedewa & Ahn, 2011; Hasson, 2017). Therefore, it is clear that the current study employed valuable and reliable methods, techniques, and variables from the previous studies.

Models for Determining Participants' PE GPA

To investigate the relationship between participating in physical activity and the Phys-Ed GPA of Asian American students, three models were employed and analyzed for all students and then calculate separately for male and female students, resulting in nine models in total. The first domain of Extracurricular activities included participation in sports and PA (the main independent variable) and Hours spent on extracurricular activities. The second domain was a series of School attitudes variables including Feels safe at school and School pride. The

third domain introduces *Demographic* variables such as Gender, Urbanicity, Region, Socioeconomic Status, Born in the USA, and Two-parent household. Ultimately these three models were run again, that was: for the female students and the male students. The data analytics strategy was the hierarchical regression technique. All results can be found in the nine models (as presented in Table 2).

Results

Models

The summary for the dependent and independent variables was presented in Table 1 including the summary of the means, standard deviations (S.D.), and other descriptive statistics for the dependent and independent variables (presented in Table 1):

Table 1. Means, Standard Deviations, Ranges and Description of Variables for Asian high-school students (N = 956)

Variable	N	Mean	S.D.	Range	Description: HSLS Variable NAME and Label
			Dependent Variable		
Phys-Ed GPA	1755	3.54	0.71	0.25-4.0	X3 GPA: Physical Education
			Extracurricular Activities		
Participated in Sports	1649	0.41	0.49	0-1	S2 F02D Participated in organized sports outside of school since fall 2009
Hours Spent on Extracurricular Activities	1608	2.21	1.26	1-6	S1 E15D Hours spent on extracurricular activities on typical schooldays
			School Attitudes		
Feels Safe at School	1646	0.92	.27	0-1	Recode of 'S1 E01A 9th grader feels safe at school' to 1=agree, 0 = Disagree
School Pride	1635	0.88	0.33	0-1	Recode of 'S1 E01B 9th grader is proud to be part of his/her school' to 1 = agree, 0 = disagree
			Demographics		
Gender	1952	0.50	.50	0-1	Recode of 'X1 Student's Sex' 1= Female, 0 = Male.
Urbanicity (Ref Suburban)					
City	1952	0.31	0.46	0-1	X1 School locale (urbanicity)
Town	1952	0.09	0.29	0-1	X1 School locale (urbanicity)
Rural	1952	0.22	0.42	0-1	X1 School locale (urbanicity)
South	1952	0.41	0.49	0-1	X1 School Geographic Region 1=South, 0=Other
Socioeconomic Status	3515	-0.16	0.73	-1.93 2.56	X1 Socio-economic status composite
Born in U.S.A.	1215	0.61	0.49	0-1	P1 B17 Whether student was born in the U.S.
Two Parent Household	1272	0.87	0.34	0-1	Recode of 'X1 P1-P2 relationship pattern' to 1= all two parent households, 0 = Other

The multivariate relationships among the rest of the variables were present in Table 2. In other words, ultimately, the nine models were run, three for all students, three for females, and three for males (see Table 2):

Table 2. OLS Regression on Personal Health and Physical Education Grades for Asian Students (N = 956) (Betas in Parentheses) [a]

Predictor Variables	All Students (n = 956)			Female Students (n = 491)			Male Students (n = 465)		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model
Extracurricular Activities									
Participated in Sports	0.15***	0.15***	0.11***	0.18***	0.17***	0.14**	0.14**	0.14**	0.08
	(0.04)	(0.37)	(0.04)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)
Hours spent on Extracurricular Activities									
	0.13	0.00	0.00	0.02	0.02	0.01	0.00	0.00	-0.01
	(0.14)	(0.01)	(0.01)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
School Attitudes									
Feels Safe	---	0.12	0.08	---	0.10	0.05	---	0.16	0.14
		(0.08)	(0.08)		(0.10)	(0.11)		(0.12)	(0.12)
School Pride	---	0.13*	0.13*	---	0.20**	0.19**	---	0.06	0.04
		(0.06)	(0.06)		(0.07)	(0.07)		(0.10)	(0.10)
Demographics									
Gender	---	---	0.08*	---	---	---	---	---	---
			(0.40)						
Urbanicity (Suburban Ref Category)									
City	---	---	0.07	---	---	0.02	---	---	0.13
			(0.04)			(0.05)			(0.70)
Town	---	---	-0.01	---	---	-0.04	---	---	0.13
			(0.07)			(0.08)	---	---	(0.12)
Rural	---	---	0.02	---	---	-0.01	---	---	0.06
			(0.05)			(0.06)			(0.07)
South	---	---	0.12**	---	---	0.09	---	---	0.15**
			(0.04)			(0.05)			(0.05)
Socioeconomic Status	---	---	0.10***	---	---	0.09***	---	---	0.11***
			(0.02)			(0.02)			(0.03)
Born in U.S.A.	---	---	0.00	---	---	0.00	---	---	0.00
			(0.04)			(0.05)			(0.05)
Two Parent Household	---	---	0.07	---	---	-0.02	---	---	0.19**
			(0.05)			(0.06)			(0.08)
Constant	3.60	3.38	3.24	3.60	3.36	3.38	3.59	3.41	3.130
Adjusted R^2	0.018	0.027	0.069	0.032	0.048	0.067	0.009	0.012	0.066

[a] Information above is based on a listwise deletion of cases. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

For the general sample, Asian-American students who participated in sports had a higher GPA (models 1-3) and that relationship was true for female students (models 4-6). However, for male students, that effect was only true until Demographics were entered into the model (model 9). The hours spent on extracurricular activities did not

affect Asian students. Having pride in one's school for the overall sample had a positive relationship with PE GPA (models 2-3), and this also was true for female students (models 5-6), however, there was no effect for male students (models 8-9). The hours spent on extracurricular activities did not affect Asian-American students.

Having pride in one's school for the overall sample had a positive relationship with PE GPA (models 2-3), and this also held for female students (models 5-6), however, there was no effect for male students (models 8-9). The impact of SES is positive and robust, thus, the higher the SES the higher the PE GPA across all models (models 3, 6, 9). Finally, while male students in Two-parents households had a higher PE GPA than their counterparts in one-parent households (model 9), the parental configuration had no significant impact on Asian-American students.

As to the other variables such as: Having pride in one's school, Impact of SES, and Parental configuration. The results of this study indicated that all Asian students who participated in PA demonstrated a positive relationship with a PE GPA (Models 2-3 and models 5-6). The results of this study also found that the higher the SES, the higher the PE GPA. Furthermore, students from Two-parent households earned higher PE GPAs than students from One-parent households, which suggested that Parental configuration did have a critical impact on the Asian High-School Students' Physical Activities, personal health, and PE GPA.

Discussion

Using the date from the latest National High School Longitudinal Study, adopting the hierarchical regression approach analyzed, and the Intersectionality theory. This study examined and analyzed how 'extracurricular physical activities', school attitudes, and other demographic variables impact on the 956 Asian American High school students' personal health and Phys-Ed GPA). Based on our research purposes, our discussion would be divided into the following sub-headings:

Differences in Cognitive Function as a Result of Sports Participation

Based on the results the first hypothesis, "no differences exist in cognitive function between the Asian high school students who participated in after-school sports or who do not participate" was accepted. For 'all Students', those who participated in after-school sports obtained a higher Phys-Ed GPA than their counterparts who did not participate; this finding is consistent with previous studies (Chief Medical Officer, 2004). For example, the report delivered by the London Department of Health stated that schoolchildren that participated in PA at least five times per week had better health and higher academic performance (Chief Medical Officer, 2004).

It is also consistent with the report of the Effect of physical education and activity levels on academic achievement in children by a previous research study (Coe et al. (2006). Thus, the current investigation confirmed their earlier research findings Coe et al. (2006) in their report about the Effect of Physical Education and Activity Levels on Academic Achievement in Children, presented evidence that described and illustrated why the positive relationship exists between physical activity and academic achievement in children; how to obtain those positive

relationships. Moreover, Castelli et al. (2015) in their findings illustrated that long-term research studies have shown that increases in physical activity levels resulted in greater academic learning time spent in physical education, and significant improvement in academic performance, such as GPA. Their findings, however, were different from the reports by Kao and Thompson (2003) and Kuo, Chong, and Joseph (2008), who stated that the school and environment conditions, educational resources, and educators' qualifications, impacted the Asian American family and their children's PA participation and their academic performance.

Nevertheless, in 'parental configuration', our findings are consistent with several previous studies (e.g., Beal, 2008; Kao & Thompson, 2003; Rothon, Goodwin, & Stansfeld, 2012). Their studies found that: Parental configuration matters; Two-parent households had more time and better conditions to participate in after-school sports programs and earned better Phys-Ed GPAs than those kids who are in One-parent households. Based on the above, the null hypothesis of no difference is rejected. Surprise, our findings partially contradict this point: the male students who participated in after-school sports did not earner a higher Phys-Ed GPA (see models 9); that seems not a reasonable result. The reasons behind this are probably related to the limitations of this sampling. All students who are from the region of the south had a higher Phys-Ed GPA than their counterparts who are not in the region of the south (see model 3). This relationship held for all students and male students (see model 3, model 9), but no regional differences for female students (see model 6). For the reasons behind this phenomenon, we speculate that this regional difference is a result of budgetary constraints. Since the year 2000, schools in the South have received more funding for, renovations or upgrades in equipment and facilities than schools that were not in the South (e.g., Dortch, 2013; Leigh, 2012; Mcgowen, 2007).

About the impact of SE*S*, the findings were positive and robust, such that the higher the SES the more students reported participation in after-school sports programs and demonstrated a higher Phys-Ed GPA across three models (Models 3, 6, & 9) (see Table 2). This finding is consistent with the findings from several previous studies by Browne and Battle (2018), Martens et al. (2014), and Rothon et al. (2012). Finally, male students in 'two-parent households' earned a better Phys-Ed GPA than their counterparts (model 9). This finding is new to know. The results suggest that parental configuration had very little or no significant impact on Asian American students although other ethnic groups might be impacted by parental configuration (Browne & Battle, 2018; Kao & Thompson, 2003; Kiehne, 2016; Rothon et al., 2012). As Browne and Battle (2018) indicated, "Racial differences in family structure have existed since at least the nineteenth century in the USA. However, beginning in the 1960s, the family structure underwent significant changes as structural and cultural forces significantly altered household structures." (p. 78).

Cognitive Function as a Result of Perceived Safety of School Environment

The results of the investigation supported the second hypothesis of "no differences exist in cognitive function between the high school students who perceive the school environment to be safe or who perceive it not safe. As can be seen in Table 2, the Feels Safe variable demonstrated no significant effect among Asian American students; which supports the hypothesis; therefore, the null hypothesis is accepted.

Regarding Differences in Cognitive Function as a Result of Gender and Region

Female students who participated in after-school sports demonstrated a higher Phys-Ed GPA (as shown in models 4-6). These findings are consistent with the findings of a previous study (e.g., Donnelly & Lambourne, 2011). These investigators also reported that female students who participated in organized sports demonstrated better academic performance. Secondly, all students from the south region had a higher Phys-Ed GPA than their counterparts who were not from the south (see model 3). This relationship was true for all students, and male students (see model 9), but no regional differences were found for female students (see model 6). As stated above, we speculate that Southern schools have received more funding to upgrade, renovate and improve their equipment and facilities in comparison to schools that are not in the South (e.g., 2018; Dortch, 2013; Leigh, 2012; Mcgowen, 2007).

Lastly, the data revealed that Asian American male high-school students in Two-parent households did not earn a better Phys-Ed GPA as their female counterparts (model 9), but no previous studies have identified this issue among Asian American high-school students. Thus, the parental configuration has no significant impact on Asian American students' education, because traditionally Asian people always put their children's education as the first priority of their family. Even though other ethnic groups' families might be impacted by their parental configuration (e.g., Browne & Battle, 2018; Kao & Thompson, 2003; Kiehne, 2016; Rothon et al., 2012).

Conclusion

Multiple previous studies have confirmed that ethnic group, economic class, and gender elements simultaneously impact minority American students' personal health, sports participation, and educational achievement. Our findings had many similarities with those previous studies (e.g., Battle et al. 2005; Beam et al. 2011; Browne & Battle, 2018). Their main point of view was: minority American families, communities, and quality of education are formed by social forces including public policy, neoliberalism, culture, and structural discrimination that exert disparate racial, gendered education unequal distribution of resources have negatively impacted minority American students' families and communities, and adversely shaped the educational attainment of these minority American students (including the Asian American students).

Our findings supported the findings of these previous researchers who pointed to the role of social forces, the larger political economy, and structural discrimination in shaping household class structure. These social factors also strengthen the contention that household structure can be a poor proxy for the educational outcomes of Asian children; rather, cultural capital and socioeconomic status may exert a greater impact on educational outcomes (e.g., Chang, 2017; Kao & Thompson, 2003; Kuo et al., 2008). Griffin and Allen (2006), and Browne and Battle (2018) indicated that the SES was more crucial in influencing children's educational outcomes than the household structure. Although their studies were conducted in Black households, we speculate that as a minority ethnic group the Asian American's experience is similar to the Black American households to some degree; hence, their findings are meaningful and can be a helpful reference to the Asian American family and students.

Lastly, the findings of this study provided meaningful information on personal health, PA and sport participation, and the Phys-Ed GPA in Asian American high-school students based on the National High School Longitudinal Study data set. The results of this study might help the policymakers to accept the intersectionality theory perspective, and to challenge them to develop structural interventions that might also affect structural racism, and other related variables, therefore, contributing to our understanding of and progress in addressing educational inequity.

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