Interaction Among Gender, Race/Ethnicity, and School Sports Participation in Youth Development

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Abstract

This study investigates whether the relationship between participation in school sports and youth development is similar for both female and male students. Moreover, the association between youth development and interaction among students' gender, race/ethnicity, and school sports participation was examined. Utilizing a survey of 79,339 Minnesota students, results suggest sports participation enhances perceived support and developmental skill for female students, but increase developmental challenges for minority female students. The results of this study demonstrate that the role of school-organized sports in student development is complex, and that more research is needed to understand the experience of different groups of students within these sports in order for participation to foster positive outcomes for all students.

INTRODUCTION

For high school seniors across the United States engaging in after school sport activities is very important (Aud, KewalRamani, & Frohlich, 2011). National Federation of High School Associations reported that approximately 55.5% of high school students play at least one school-organized sport (High School Sports, n.d.). Participation in school-organized sports has a long established relationship with many indicators of positive development, such as resiliency, academic performance, psychological adjustments and lower levels of depression (Bradley, Kean, & Crawford, 2013; Fredricks & Eccles, 2005, 2006; Peck, Roeser, Zarret, & Eccles, 2008; Van Boekel, Bulut, Stanke, Palma Zamora, Jang, Kang, & Nickodem, 2016). Given these

relationships, an interesting question to ask is whether these benefits can be extended to all subgroups of students in the same manner.

Adolescence is a time for many cognitive and developmental changes (Sebastian, Burnett, & Blakemore, 2008; Steinberg, 2005; Yurgelun-Todd, 2007), and these changes are not always similar for females and males. For example, female and male high school students tend to report varying degrees of depression, likely caused by the increased number of new challenges female adolescents face compared to adolescent males (Nolen-Hoeksema & Girgus, 1994; Petersen, Sarigiani, & Kennedy, 1991). Furthermore, participation rates in school-organized sports for male seniors are higher (46%) than female seniors (31%) (National Center for Education Statistics, 2011). Consequently, the following research questions were addressed:

1. Do student athletes' perceptions of developmental support, self-reported developmental skills, and developmental challenges differ, on average, from non-athlete students?
2. Is sports participation associated with female students' perceptions of developmental support, self-reported developmental skills, and challenges in a similar manner to male students?
3. Is sports participation associated with perceptions of developmental support, self-reported developmental skills, and developmental challenges for minority race/ethnic male and female students in equal proportion as for white male students?

METHODS

Procedure and Instrument

This study involves secondary data analysis of the MSS database. The survey was designed by an interagency team from the Minnesota Departments of Education, Health and Human Services, Public Safety, and Corrections to monitor important trends and support

planning efforts of the collaborating state agencies and local public school districts, as well as youth serving agencies and organizations. The MSS is a statewide survey that is used to monitor trends in students' behaviors and thoughts related to academics, school climate, out-of-school activities, violence and safety, health, positive and risky behaviors, and family environment. The MSS is administered every three years.

Participants

The 2013 MSS was administered to 162,034 students from the 5th, 8th, 9th, and 11th grades. This study included the 9th and 11th grade students since the survey questions of interest were asked only to those students. The sample size of this study was 79,339. The age of the students ranged from 13 to 19 years old with a mean of 15.6 years (SD = 1.13). Males (n = 39,793) and females (n = 39,546) each composed approximately 50% of the sample. The sample consisted of mostly White (74%) followed by Multiracial (7%), Latino (6%), Asian (3%), Black (4%), Hmong (3%), Native Hawaiian or Pacific Islanders (2%), American Indian (1%), and Somali (1%) youth. The race and ethnicity are mutually exclusively categorized in this study. Students who reported participating in a school-organized sport at least 1-2 times per week were classified as Athletes, while those who participated less than once a week were classified as Non-Athletes. This distinction was drawn because research has demonstrated that infrequent participation in sports produces a similar student profile as students with no sports participation (Linver, Roth, & Brooks-Gunn, 2009). The sample comprised of 49% Athletes (n = 37,195) and 51% Non-Athletes (n = 39,173). See Table 1 for a breakdown of student athletes versus non-athletes by gender and race/ethnicity.

Measures

The measures of developmental skills, support, and challenges were created based on the positive youth development research of Search Institute, and three scales adopted from the Developmental Asset Profile (DAP, Search Institute), and factors from theory and prior research from the 2013 MSS item-level data. Proposed measures were identified and tested for model-data fit. Confirmatory factor analysis (CFA) was used to provide evidence that supports resulting scores to indicate the extent to which the proposed skills, supports, and challenges as measured with the MSS fit the observed data, which are responses. The CFAs were conducted using Mplus (Muthén, L.K., & Muthén, B.O., 2012) which provided three pertinent evidence: model-data fit information, item-factor loadings, and correlations among measures.

Following evaluation of fit, the Rasch measurement model was used to calibrate items with Winsteps Version 3.92.1 (Linacre, 2016). As a latent-trait model, the assumption is that students' level of a trait causes their responses to the relevant items. Through the response-rates to item response options and response patterns across items, the Rasch model estimates probabilities of responses to items. This process estimates the location of each item on the underlying trait – whether a certain response to an item (given the item's response options) requires a low or high level of the trait. Each measure is scaled around zero by default, generally ranging from -5 to +5 (much like a standardized score). The location of the average item response defines the zero point on the Rasch score scale (technically in the logit or logistic metric). Once item responses are located on this scale, persons can then be located on the trait scale as defined by the items, based on the likelihood of their trait level given their responses to the items with known (fixed) locations on the scale (Rodriguez, 2017).

As a result, from students' responses on 2013 MSS items, three scales of developmental support were created: Teacher/School Support (TSS), Family/Community Support (SP), and

Empowerment (EM). Three scales of developmental skills were created: Social Competence (SC), Positive Identity (PI), and Commitment to Learning (CTL). Lastly, five scales of developmental challenges were devised: School Violence (SV), Family Violence (FV), Mental Distress (MD), Bullying behavior (BY), and being Bullied (BD).

Statistical Analysis

Three regression models were conducted for each of the eleven developmental supports, skills, and challenges. The first model included only the main effects of *female* with male as the reference group, *athlete* as an indication of school sports participation with non-athlete as the reference group, and *students of color (SoC)* with white students as the reference group, and control variables *students' age, free or reduced lunch status*, and *whether they receive Individualized Education Program (IEP).* The second regression model included the same predictors in the first model as well as two-way interactions for *gender* and *school sports participation* and for *gender* and *SoC*. The third regression model included all the predictors in the second model as well as two-way interactions for *gender* and *SoC* and three-way interactions for *SoC*, *gender*, and *school sports participation*.

RESULTS

Developmental Supports and Skills

The results from the first regression model for each developmental support and skill are shown in Table 2. The results imply that athletes were, on average, 0.19 standard deviations (*SD*s) to 0.35 *SD*s higher than non-athletes on developmental skill and support measure, controlling for all other covariates. Moreover, female students were, on average, 0.14 *SD*s higher on social competence and 0.72 *SD*s higher on commitment to learning than their male peers holding all other covariates constant. However, female students were also, on average, 0.04 *SD*s lower on

teacher/school support, 0.07 *SD*s lower on empowerment, and 0.26 *SD*s lower on positive identity than male students holding all other covariates constant. These differences between male and female athletes suggest that it is necessary to further investigate the interaction between gender and sports participation.

Table 3 contains results of the second regression model for each developmental supports and skills with two-way interactions. The interaction of identifying as both female and an athlete was significant only for two measures. Female athletes were, on average, 0.03 *SD*s lower on empowerment and 0.04 *SD*s lower on commitment to learning than non-athlete male peers. This indicates that sports participation have almost the same positive relationship with developmental skills for female and male students.

Also, the interaction of identifying as both female and as a student of color was significant for all five supports and skills. However, the direction of the interaction implies that female-minority students perceive having lower levels of support from family, friends, teachers, their school, and their community, and report lower measures of developmental skills than white male students. These results highlight the need for a further analysis of the three-way among gender, sports participation, and students' race/ethnicity to investigate whether sports participation is equally beneficial for minority female students. In the analysis that follows we further breakdown the *student of color* variable and investigate these interactions for the different race and ethnicities that represent students in Minnesota schools.

The regression models with three-way interaction term are included in Table 4. The result indicate that Asian female athletes are, on average, 0.19 *SD*s lower on social competence and both Asian and Hmong female athletes are, on average, 0.21 *SD*s and 0.17 *SD*s lower on commitment to learning than white male non-athlete peers, controlling for all other covariates.

Multiple race or ethnicity female athletes are, on average, 0.10 *SD*s lower on family, friends, and community supports and 0.11 *SD*s lower on empowerment compared to white male non-athlete peers. The interaction of identifying as black, female, and as an athlete as well as Somali, female, and as an athlete was significant for all five supports and skills. Unfortunately, the direction of the interaction suggests school sports participation does not provide equal benefits to black and Somali female students to the same degree as it does for white male non-athlete peers.

Developmental Challenges

Table 5 contains the results of the first regression model for each developmental challenge. Students participating in school sports are, on average, 0.06 *SD*s lower on social violence, 0.15 *SD*s lower on family violence, and 0.30 *SD*s lower on mental distress than non-athlete peers. Recall that this is a desired trend, representing a reduction in the negative developmental challenges. Experiences of bullying and getting bullied were not significantly different for athletes and non-athletes at the $\alpha = .05$ level. This indicates that sports participation plays role in alleviating some of the developmental challenges of students. However, female students are, on average, 0.13 *SD*s higher on family violence, 0.45 *SD*s higher on mental distress, and 0.22 *SD*s higher on getting bullied whereas 0.21 *SD*s slower on social violence, 0.19 *SD*s lower on bullying than male peers. Students of color are, on average, 0.07 *SD*s to 0.15 *SD*s significantly higher than their white peers on all five developmental challenge scales at the $\alpha = .05$ level.

The second regression models for each developmental challenges including two-way interactions are presented in Table 6. Female athletes were, on average, lower on all five developmental challenge measures than male non-athletes, but the difference on social violence was not significant. This implies that school sports participation is critical especially for those

female students with very high mental distress. Conversely, female minority students are, on average, 0.05 *SD*s higher on social violence, 0.06 *SD*s higher on family violence, 0.07 *SD*s higher on mental distress, and 0.06 *SD*s lower on getting bullied than their white male peers. Figure 1 also presents the degree of mental distress is different to a great extent across different gender compared to other developmental challenge measures. Moreover, Figure 2 shows that participating in school sports is not equally beneficial for males and females. The present results highlight the need for a further analysis of the three-way among gender, school sports participation, and students' race/ethnicity to investigate whether school sports participation is equally beneficial for minority female students.

The third regression models for each developmental challenge with three-way interactions are included in Table 7. The interaction of Somali, school sports participation, and female was significant: Somali female athletes are, on average, 0.34 *SD*s to 0.95 *SD*s higher on all five developmental challenges than white male non-athlete peers. Asian female athletes are, on average, 0.20 *SD*s higher on mental distress than their white male non-athletes. This indicates sports participation worsens Somali female student' all five developmental challenges and worsens Asian female students' mental distress. Conversely, participating in school sports alleviated social violence for American Indian female students, family violence and mental distress for Native Hawaiian or Pacific Islander female students, and social violence and mental distress for Latino female students.

DISCUSSION AND SIGNIFICANCE

When examining the relationships between participation in school-organized sports and youth development, research has consistently demonstrated positive outcomes (Bradley, Kean & Crawford, 2013; Fredricks & Eccles, 2005, 2006; Peck, Roeser, Zarret & Eccles, 2008; Van

Boekel et al., 2016). The limitation of these studies is that these research typically discuss positive relationships as uniform, and as experiences shared by all students. This generalization is problematic. Recently, Nickodem and colleagues (2016) demonstrated that the relationship between participating in school-organized sports and various developmentally supportive and challenging outcome behaviors varies considerably when the relationships were studied separately for heterosexual, lesbian and gay, and bisexual students.

Building on Nickodem et al.'s (2016) findings, our research suggests that participation in school-organized sports is positively related to developmental skills and supports such as teacher/school support, family/friends/community supports, students' empowerment, social competence, positive identity, and commitment to learning and related to decreases in developmental challenges such as social violence, family violence, and mental distress. However, when we explored these relationships separately for males and females, and then males and females within their respective race and ethnicity, pre-specified relationships were not as clear. The results of this study demonstrate that the role of school-organized sports in student development is complex, and that more research is needed to understand the experience of different groups of students within these sports in order for participation to foster positive outcomes for all students.

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Table 1

Number and Percent of Students by Athlete/Non-Athlete, Race/Ethnicity, and Gender

Athlete/ Non-Athlete		*Race - Gender*										*Ethnicity - Gender*								Total
		American Indian Female	American Indian Male	Asian Female	Asian Male	Black Female	Black Male	Native Hawaiian PI Female	Native Hawaiian PI Male	White Female	White Male	Multiple Race/ Ethnicity Female	Multiple Race/ Ethnicity Male	Latino Female	Latino Male	Somali Female	Somali Male	Hmong Female	Hmong Male	
Athlete	N	106	165	340	383	511	850	27	39	14534	15260	1077	1219	689	1013	55	159	267	276	36970
	% by athlete/ non-athlete	33.3%	41.0%	30.3%	37.3%	34.7%	54.0%	43.5%	46.4%	50.7%	54.0%	37.9%	47.2%	29.4%	44.4%	18.2%	49.1%	26.3%	24.9%	48.8%
Non-Athlete	N	212	237	781	645	962	723	35	45	14116	13013	1651	1270	1651	1270	248	165	750	831	38808
	% by athlete/ non-athlete	66.7%	59.0%	69.7%	62.7%	65.3%	46.0%	56.5%	53.6%	49.3%	46.0%	62.1%	52.8%	70.6%	55.6%	81.8%	50.9%	73.7%	75.1%	51.2%
Total	N	318	402	1121	1028	1473	1573	62	84	28650	28273	2838	2582	2340	2283	303	324	1017	1107	75778

Table 2

Standardized Regression Coefficients and Standard Errors Predicting Developmental Supports and Skills: With No Interaction Terms

	Dependent variable:					
	TSS	SP	EM	SC	PI	CTL
Constant	0.340***	0.021	−0.096*	0.366***	0.299***	−0.154***
	(0.053)	(0.052)	(0.052)	(0.052)	(0.052)	(0.051)
Age	−0.022***	−0.006*	0.006*	−0.031***	−0.016***	−0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Special Education	0.044***	0.045***	−0.194***	−0.157***	−0.158***	−0.213***
	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Free/Reduced Lunch	−0.184***	−0.248***	−0.255***	−0.229***	−0.167***	−0.170***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Female	−0.038***	−0.008	−0.073***	0.144***	−0.259***	0.272***
	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Athlete	0.191***	0.347***	0.328***	0.257***	0.302***	0.243***
	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)
Students of Color	−0.091***	−0.172***	−0.131***	−0.072***	−0.057***	0.093***
	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Observations	68,631	68,917	69,816	71,082	69,935	73,706
R^2	0.023	0.061	0.063	0.045	0.057	0.046
Adjusted R^2	0.023	0.061	0.063	0.045	0.057	0.046
Residual Std. Error	0.986 (df = 68624)	0.968 (df = 68910)	0.967 (df = 69809)	0.974 (df = 71075)	0.968 (df = 69928)	0.974 (df = 73699)
F Statistic	274.422*** (df = 6; 68624)	744.246*** (df = 6; 68910)	778.986*** (df = 6; 69809)	560.620*** (df = 6; 71075)	705.998*** (df = 6; 69928)	587.878*** (df = 6; 73699)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 3

Standardized Regression Coefficients and Standard Errors Predicting Developmental Supports and Skills: With Two-Way Interaction Terms

	Dependent variable:					
	TSS	SP	EM	SC	PI	CTL
Constant	0.327***	0.007	−0.106**	0.351***	0.292***	−0.164***
	(0.053)	(0.052)	(0.052)	(0.052)	(0.052)	(0.051)
Age	−0.023***	−0.006*	0.005*	−0.031***	−0.016***	−0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Special Education	0.044***	0.046***	−0.193***	−0.157***	−0.159***	−0.212***
	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Free/Reduced Lunch	−0.185***	−0.249***	−0.255***	−0.229***	−0.167***	−0.170***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Female	−0.008	0.022*	−0.049***	0.177***	−0.246***	0.300***
	(0.012)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)
Athlete	0.202***	0.356***	0.340***	0.260***	0.299***	0.261***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.010)
Students of Color	−0.050***	−0.127***	−0.106***	−0.011	−0.025**	0.112***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)
Female ∗Athlete	−0.023	−0.020	−0.025*	−0.008	0.004	−0.037**
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Female ∗Students of Color	−0.081***	−0.089***	−0.051***	−0.121***	−0.063***	−0.039**
	(0.018)	(0.018)	(0.017)	(0.017)	(0.017)	(0.017)
Observations	68,631	68,917	69,816	71,082	69,935	73,706
R^2	0.024	0.061	0.063	0.046	0.057	0.046
Adjusted R^2	0.024	0.061	0.063	0.046	0.057	0.046
Residual Std. Error	0.985 (df = 68622)	0.968 (df = 68908)	0.967 (df = 69807)	0.974 (df = 71073)	0.968 (df = 69926)	0.974 (df = 73697)
F Statistic	208.544*** (df = 8; 68622)	561.646*** (df = 8; 68908)	585.602*** (df = 8; 69807)	426.901*** (df = 8; 71073)	531.308*** (df = 8; 69926)	442.293*** (df = 8; 73697)
Note:						*p<0.1; **p<0.05; ***p<0.01

Table 4

Standardized Regression Coefficients and Standard Errors Predicting Developmental Supports and Skills: With Three-Way Interaction Terms

	Dependent variable:					
	TSS	SP	EM	SC	PI	CTL
Constant	0.346***	0.003	−0.109**	0.364***	0.294***	−0.116**
	(0.053)	(0.052)	(0.052)	(0.052)	(0.052)	(0.050)
Age	−0.024***	−0.006*	0.005	−0.032***	−0.017***	−0.007**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Special Education	0.062***	0.048***	−0.187***	−0.143***	−0.151***	−0.183***
	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Free/Reduced Lunch	−0.191***	−0.251***	−0.263***	−0.239***	−0.182***	−0.194***
	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Female	−0.018**	0.013	−0.061***	0.174***	−0.243***	0.283***
	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Athlete	0.211***	0.365***	0.355***	0.274***	0.324***	0.269***
	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)
American Indian	−0.172**	−0.219***	−0.243***	−0.191***	−0.149**	−0.166**
	(0.069)	(0.069)	(0.068)	(0.067)	(0.067)	(0.065)
Asian	0.198***	−0.101**	−0.064	0.151***	−0.020	0.480***
	(0.042)	(0.042)	(0.041)	(0.042)	(0.042)	(0.040)
Black	−0.143***	0.027	0.076*	0.115***	0.210***	0.195***
	(0.043)	(0.042)	(0.041)	(0.041)	(0.042)	(0.038)
Native Hawaiian/Pacific Islander	−0.434***	−0.390**	−0.057	−0.231	−0.215	0.024
	(0.160)	(0.155)	(0.155)	(0.154)	(0.153)	(0.148)
Multiple Race/Ethnicity	−0.171***	−0.159***	−0.165***	−0.129***	−0.091***	−0.126***
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.028)
Latino	−0.008	−0.049	−0.011	0.039	0.081***	0.111***
	(0.031)	(0.031)	(0.030)	(0.030)	(0.030)	(0.029)
Somali	0.128	0.035	0.164**	0.219***	0.295***	0.342***
	(0.084)	(0.084)	(0.083)	(0.082)	(0.083)	(0.079)
Hmong	0.095**	−0.254***	−0.157***	0.064*	−0.057	0.438***
	(0.038)	(0.038)	(0.037)	(0.037)	(0.037)	(0.036)
American Indian ∗Female	−0.264***	−0.105	−0.135	−0.366***	−0.159*	−0.318***
	(0.098)	(0.100)	(0.097)	(0.096)	(0.096)	(0.093)
Asian ∗Female	0.025	0.061	0.058	−0.030	0.037	0.101*
	(0.057)	(0.056)	(0.056)	(0.055)	(0.056)	(0.054)
Black ∗Female	0.051	−0.102*	−0.003	−0.120**	−0.048	0.078
	(0.055)	(0.054)	(0.054)	(0.053)	(0.054)	(0.050)
Native Hawaiian/Pacific Islander ∗Female	0.318	0.213	−0.041	0.142	0.146	0.110
	(0.236)	(0.233)	(0.229)	(0.225)	(0.226)	(0.220)
Multiple Race/Ethnicity ∗Female	−0.059	−0.095**	−0.041	−0.066*	−0.053	−0.041
	(0.039)	(0.038)	(0.038)	(0.037)	(0.038)	(0.036)
Latino ∗Female	−0.113***	−0.114***	−0.102**	−0.207***	−0.175***	−0.087**
	(0.041)	(0.040)	(0.040)	(0.039)	(0.039)	(0.038)
Somali ∗Female	0.053	0.276**	0.257**	0.074	0.136	0.242**
	(0.108)	(0.108)	(0.106)	(0.105)	(0.106)	(0.101)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 4

Standardized Regression Coefficients and Standard Errors Predicting Developmental Supports and Skills: With Three-Way Interaction Terms (Continued)

	Dependent variable:					
	TSS	SP	EM	SC	PI	CTL
Hmong∗Female	0.056	0.013	0.078	0.001	0.121**	0.155***
	(0.054)	(0.053)	(0.053)	(0.052)	(0.053)	(0.051)
AI ∗Athlete	0.140	0.136	0.004	0.015	−0.037	0.002
	(0.106)	(0.106)	(0.103)	(0.102)	(0.103)	(0.101)
Asian ∗Athlete	−0.029	−0.028	−0.088	−0.020	−0.073	−0.092
	(0.068)	(0.067)	(0.067)	(0.067)	(0.068)	(0.064)
Black ∗Athlete	0.050	−0.075	−0.092*	0.009	−0.105*	0.006
	(0.057)	(0.056)	(0.055)	(0.055)	(0.055)	(0.051)
Native Hawaiian/Pacific Islander ∗Athlete	0.260	0.026	−0.161	0.027	0.036	−0.397*
	(0.234)	(0.227)	(0.230)	(0.227)	(0.229)	(0.220)
Multiple Race/Ethnicity ∗Athlete	0.002	−0.008	0.020	0.009	−0.013	0.042
	(0.042)	(0.041)	(0.041)	(0.041)	(0.041)	(0.040)
Latino ∗Athlete	−0.040	−0.104**	−0.151***	−0.179***	−0.180***	−0.096**
	(0.045)	(0.045)	(0.044)	(0.044)	(0.044)	(0.042)
Somali ∗Athlete	−0.075	0.098	−0.105	0.080	−0.007	−0.013
	(0.118)	(0.119)	(0.117)	(0.116)	(0.117)	(0.111)
Hmong ∗Athlete	−0.097	−0.104	−0.163**	−0.043	−0.078	−0.070
	(0.074)	(0.073)	(0.072)	(0.072)	(0.072)	(0.069)
American Indian ∗Athlete ∗Female	−0.099	−0.246	0.007	0.016	−0.045	0.041
	(0.162)	(0.162)	(0.158)	(0.157)	(0.157)	(0.154)
Asian∗Athlete ∗Female	−0.127	−0.151	−0.118	−0.186**	−0.118	−0.206**
	(0.095)	(0.095)	(0.094)	(0.094)	(0.094)	(0.091)
Black ∗Athlete ∗Female	−0.291***	−0.188**	−0.238***	−0.188**	−0.151*	−0.179**
	(0.082)	(0.080)	(0.080)	(0.079)	(0.080)	(0.074)
Native Hawaiian/Pacific Islander ∗Athlete ∗Female	−0.581	−0.141	−0.119	−0.336	−0.179	0.031
	(0.365)	(0.349)	(0.349)	(0.343)	(0.347)	(0.340)
Multiple Race/Ethnicity ∗Athlete ∗Female	−0.084	−0.098*	−0.111**	−0.028	−0.063	−0.060
	(0.058)	(0.057)	(0.056)	(0.056)	(0.056)	(0.054)
Latino ∗Athlete ∗Female	−0.026	0.061	0.036	0.096	0.073	−0.033
	(0.065)	(0.064)	(0.063)	(0.063)	(0.063)	(0.061)
Somali ∗Athlete ∗Female	−0.543***	−0.706***	−0.676***	−0.590***	−0.409**	−0.501***
	(0.193)	(0.197)	(0.191)	(0.191)	(0.192)	(0.184)
Hmong ∗Athlete ∗Female	−0.076	−0.121	−0.122	−0.112	−0.118	−0.167*
	(0.106)	(0.104)	(0.103)	(0.102)	(0.103)	(0.099)
Observations	68,631	68,917	69,816	71,082	69,935	73,706
R^2	0.029	0.064	0.067	0.051	0.061	0.062
Adjusted R^2	0.029	0.064	0.066	0.050	0.061	0.061
Residual Std. Error	0.983	0.966	0.965	0.972	0.966	0.966
F Statistic	56.000***	127.874***	134.508***	102.151***	123.528***	131.080***

Note: *p<0.1; **p<0.05; ***p<0.01

Table 5

Standardized Regression Coefficients and Standard Errors Predicting Developmental Challenges: With No Interaction Terms

	Dependent variable:				
	SV	FV	MD	BY	BD
Constant	−0.334***	−0.019	−0.563***	0.333***	0.357***
	(0.051)	(0.052)	(0.050)	(0.053)	(0.051)
Age	0.026***	−0.007**	0.024***	−0.020***	−0.034***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Special Education	0.099***	0.183***	0.350***	0.160***	0.249***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Free/Reduced Lunch	0.073***	0.316***	0.208***	0.132***	0.127***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Female	−0.206***	0.131***	0.447***	−0.185***	0.223***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Athlete	−0.059***	−0.152***	−0.296***	−0.007	−0.012
	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)
Students of Color	0.085***	0.153***	0.118***	0.109***	0.067***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Observations	73,634	69,477	70,240	70,454	73,564
R^2	0.018	0.049	0.108	0.020	0.025
Adjusted R^2	0.018	0.049	0.108	0.020	0.025
Residual Std. Error	0.981 (df = 73627)	0.972 (df = 69470)	0.945 (df = 70233)	0.987 (df = 70447)	0.984 (df = 73557)
F Statistic	226.571*** (df = 6; 73627)	600.361*** (df = 6; 69470)	1,413.876*** (df = 6; 70233)	235.761*** (df = 6; 70447)	312.089*** (df = 6; 73557)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 6

Standardized Regression Coefficients and Standard Errors Predicting Developmental Challenges: With Two-Way Interaction Terms

	Dependent variable:				
	SV	FV	MD	BY	BD
Constant	−0.328***	−0.023	−0.573***	0.329***	0.343***
	(0.051)	(0.052)	(0.050)	(0.053)	(0.051)
Age	0.026***	−0.007**	0.023***	−0.020***	−0.035***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Special Education	0.099***	0.185***	0.353***	0.161***	0.250***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Free/Reduced Lunch	0.073***	0.315***	0.208***	0.131***	0.127***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Female	−0.217***	0.149***	0.483***	−0.171***	0.258***
	(0.011)	(0.012)	(0.011)	(0.012)	(0.011)
Athlete	−0.059***	−0.119***	−0.243***	0.013	0.007
	(0.010)	(0.011)	(0.010)	(0.011)	(0.010)
Students of Color	0.062***	0.120***	0.083***	0.095***	0.098***
	(0.012)	(0.013)	(0.012)	(0.013)	(0.012)
Female ∗Athlete	0.001	−0.063***	−0.104***	−0.039***	−0.040***
	(0.015)	(0.015)	(0.014)	(0.015)	(0.015)
Female ∗Students of Color	0.046***	0.061***	0.067***	0.024	−0.063***
	(0.017)	(0.018)	(0.017)	(0.018)	(0.017)
Observations	73,634	69,477	70,240	70,454	73,564
R^2	0.018	0.050	0.109	0.020	0.025
Adjusted R^2	0.018	0.050	0.109	0.020	0.025
Residual Std. Error	0.981 (df = 73625)	0.972 (df = 69468)	0.944 (df = 70231)	0.987 (df = 70445)	0.984 (df = 73555)
F Statistic	170.885*** (df = 8; 73625)	454.769*** (df = 8; 69468)	1,070.939*** (df = 8; 70231)	178.063*** (df = 8; 70445)	236.497*** (df = 8; 73555)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 7

Standardized Regression Coefficients and Standard Errors Predicting Developmental Challenges: With Three-Way Interaction Terms

	Dependent variable:				
	SV	FV	MD	BY	BD
Constant	−0.338***	−0.029	−0.568***	0.313***	0.342***
	(0.051)	(0.052)	(0.050)	(0.053)	(0.051)
Age	0.028***	−0.005	0.026***	−0.018***	−0.033***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Special Education	0.080***	0.168***	0.336***	0.138***	0.232***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Free/Reduced Lunch	0.088***	0.337***	0.230***	0.150***	0.146***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Female	−0.219***	0.113***	0.426***	−0.194***	0.235***
	(0.008)	(0.008)	(0.008)	(0.009)	(0.008)
Athlete	−0.090***	−0.180***	−0.328***	−0.029***	−0.053***
	(0.008)	(0.009)	(0.008)	(0.009)	(0.008)
American Indian	−0.005	0.056	0.003	0.203***	0.082
	(0.066)	(0.068)	(0.066)	(0.068)	(0.066)
Asian	−0.244***	0.065	−0.033	−0.118***	−0.014
	(0.041)	(0.042)	(0.040)	(0.042)	(0.041)
Black	0.005	0.074*	−0.163***	0.072*	0.025
	(0.039)	(0.042)	(0.041)	(0.042)	(0.039)
Native Hawaiian/Pacific Islander	0.236	0.119	0.025	0.217	0.084
	(0.149)	(0.159)	(0.151)	(0.158)	(0.150)
Multiple Race/Ethnicity	0.199***	0.244***	0.206***	0.274***	0.152***
	(0.028)	(0.029)	(0.028)	(0.029)	(0.028)
Latino	0.005	−0.099***	−0.069**	0.009	−0.053*
	(0.029)	(0.031)	(0.029)	(0.031)	(0.030)
Somali	0.330***	−0.025	−0.322***	0.116	0.173**
	(0.079)	(0.083)	(0.079)	(0.083)	(0.080)
Hmong	−0.341***	−0.055	−0.048	−0.298***	−0.221***
	(0.036)	(0.038)	(0.036)	(0.038)	(0.037)
American Indian∗Female	0.257***	0.327***	0.286***	0.200**	0.014
	(0.095)	(0.097)	(0.093)	(0.097)	(0.095)
Asian∗Female	0.122**	−0.125**	−0.122**	−0.006	−0.223***
	(0.054)	(0.056)	(0.054)	(0.057)	(0.054)
Black ∗Female	−0.030	−0.024	0.087*	0.065	−0.207***
	(0.050)	(0.054)	(0.052)	(0.055)	(0.050)
Native Hawaiian/Pacific Islander∗Female	−0.086	0.420*	0.310	−0.088	0.059
	(0.223)	(0.234)	(0.221)	(0.235)	(0.223)
Multiple Race/Ethnicity ∗Female	0.045	0.151***	0.185***	0.013	0.075**
	(0.037)	(0.038)	(0.037)	(0.038)	(0.037)
Latino ∗Female	0.103***	0.202***	0.204***	0.036	0.046
	(0.038)	(0.040)	(0.038)	(0.040)	(0.039)
Somali ∗Female	−0.353***	−0.515***	−0.288***	−0.290***	−0.228**
	(0.102)	(0.106)	(0.102)	(0.107)	(0.102)
Hmong∗Female	0.112**	−0.046	−0.038	0.081	−0.130**
	(0.052)	(0.054)	(0.051)	(0.054)	(0.052)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 7

Standardized Regression Coefficients and Standard Errors Predicting Developmental Challenges: With Three-Way Interaction Terms (Continued)

	Dependent variable:				
	SV	FV	MD	BY	BD
American Indian∗Athlete	0.303***	0.221**	0.312***	−0.080	0.186*
	(0.101)	(0.104)	(0.100)	(0.105)	(0.102)
Asian∗Athlete	0.098	0.053	0.137**	0.120*	0.153**
	(0.065)	(0.068)	(0.065)	(0.068)	(0.065)
Black ∗Athlete	0.049	0.110**	0.216***	0.133**	0.165***
	(0.052)	(0.056)	(0.054)	(0.056)	(0.052)
Native Hawaiian/Pacific Islander ∗Athlete	0.442**	0.260	0.451**	0.384*	0.391*
	(0.225)	(0.234)	(0.219)	(0.233)	(0.225)
Multiple Race/Ethnicity ∗Athlete	0.066*	0.007	0.023	−0.030	0.106***
	(0.040)	(0.041)	(0.040)	(0.042)	(0.040)
Latino ∗Athlete	0.167***	0.221***	0.231***	0.112**	0.185***
	(0.043)	(0.045)	(0.043)	(0.045)	(0.043)
Somali ∗Athlete	−0.140	0.014	0.217*	0.074	0.071
	(0.112)	(0.118)	(0.114)	(0.119)	(0.113)
Hmong ∗Athlete	0.303***	0.137*	0.179**	0.024	0.221***
	(0.070)	(0.073)	(0.070)	(0.073)	(0.071)
American Indian∗Athlete ∗Female	−0.281*	−0.095	−0.150	0.041	−0.009
	(0.156)	(0.159)	(0.152)	(0.159)	(0.156)
Asian ∗Athlete ∗Female	−0.005	0.150	0.195**	−0.073	0.004
	(0.092)	(0.095)	(0.091)	(0.096)	(0.092)
Black ∗Athlete ∗Female	0.117	0.108	0.061	0.010	0.105
	(0.075)	(0.080)	(0.077)	(0.081)	(0.075)
Native Hawaiian/Pacific Islander ∗Athlete ∗Female	−0.148	−0.623*	−0.731**	0.245	−0.197
	(0.340)	(0.356)	(0.335)	(0.356)	(0.339)
Multiple Race/Ethnicity ∗Athlete ∗Female	−0.042	0.026	−0.051	0.025	−0.031
	(0.055)	(0.057)	(0.054)	(0.057)	(0.055)
Latino ∗Athlete ∗Female	−0.119*	−0.101	−0.157**	−0.049	−0.051
	(0.062)	(0.064)	(0.061)	(0.064)	(0.062)
Somali ∗Athlete ∗Female	0.954***	0.781***	0.365**	0.421**	0.336*
	(0.185)	(0.195)	(0.186)	(0.195)	(0.187)
Hmong ∗Athlete ∗Female	−0.087	−0.133	−0.070	0.094	−0.100
	(0.100)	(0.104)	(0.100)	(0.105)	(0.101)
Observations	73,634	69,477	70,240	70,454	73,564
R^2	0.026	0.057	0.116	0.027	0.032
Adjusted R^2	0.025	0.056	0.116	0.027	0.032
Residual Std. Error	0.978	0.969	0.940	0.984	0.980
F Statistic	52.794***	112.967***	249.495***	53.453***	66.030***

Note: *p<0.1; **p<0.05; ***p<0.01

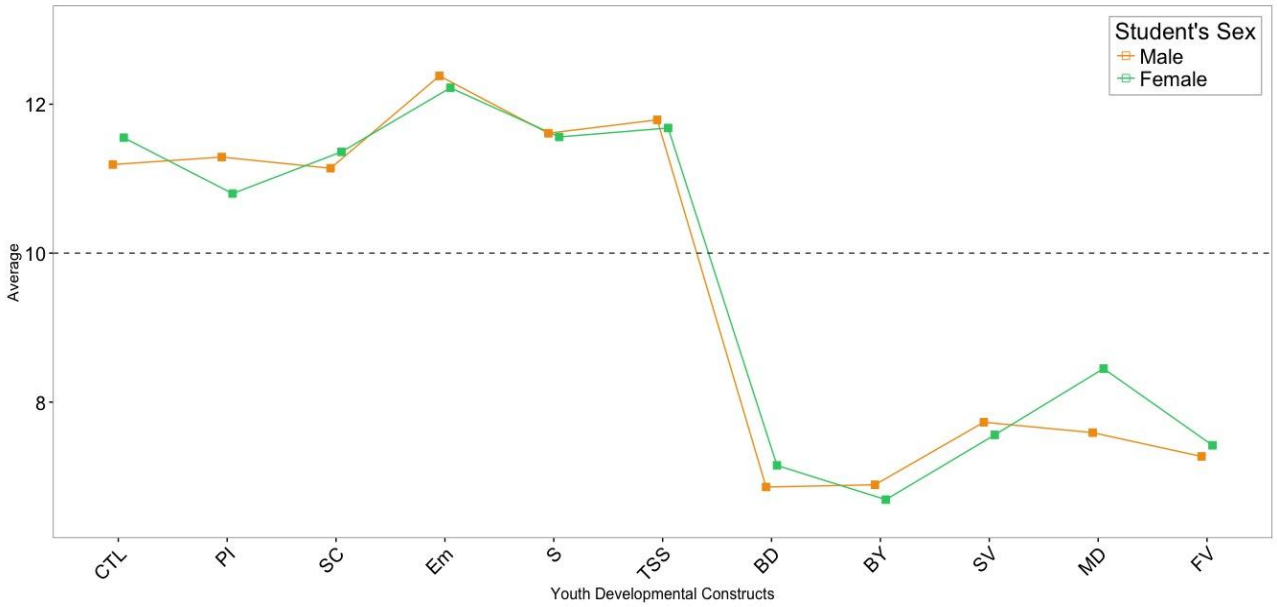

Figure 1. Average developmental supports, skills, and challenges scale scores for female and male students. The horizontal line at 10 is the average score set for scaling.

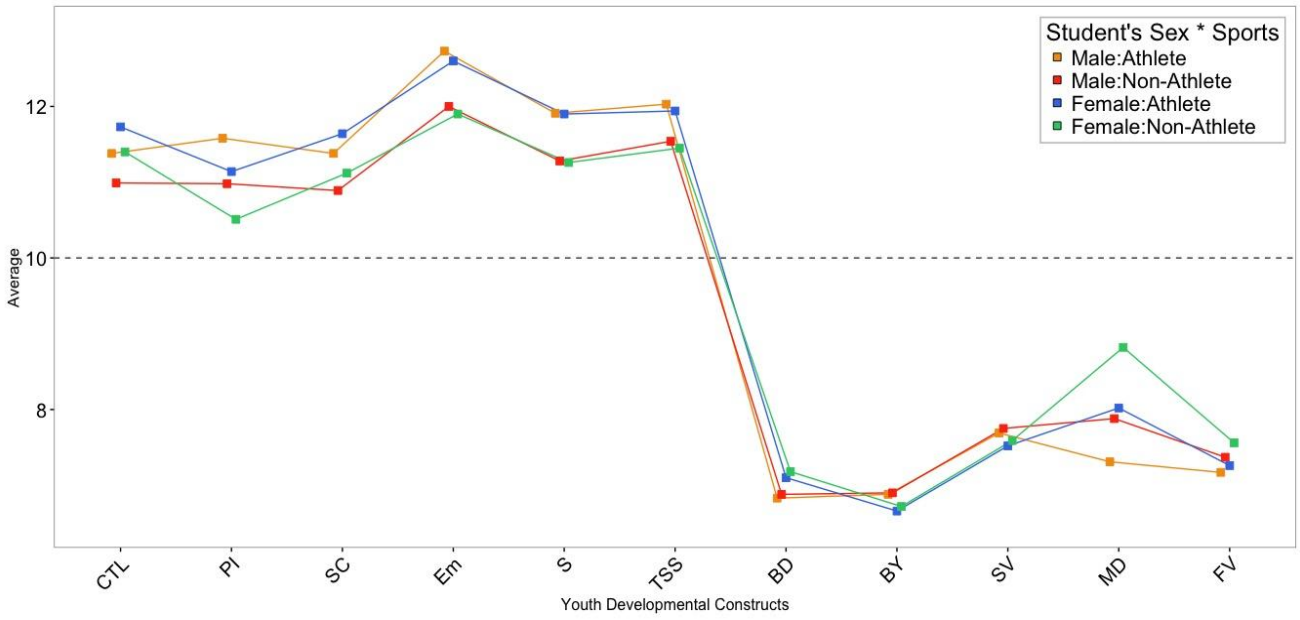

Figure 2. Average developmental supports, skills, and challenges scale scores for female-athlete, male-athlete, female non-athlete, and male non-athlete students. The horizontal line at 10 is the average score set for scaling.