In the following report, Hanover Research explores theoretical and empirical literature on the relationship between arts participation, athletics participation, and indicators of student success.
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EXECUTIVE SUMMARY AND KEY FINDINGS

INTRODUCTION

Many students participate in school-based arts education and athletics/physical education programs each year, both during the school day and after school. Researchers and educators argue that arts and athletics yield positive benefits to student participants, both in the classroom and throughout their postsecondary life. At the same time, some observers have questioned whether increased investment in arts and athletics programs negatively impacts the quality of instruction in core content areas, such as reading and mathematics. ¹ This report discusses current theoretical and empirical literature that describes the relationship between arts participation, athletics participation, and indicators of student success.

KEY FINDINGS

- **Researchers believe that arts education supports student achievement by increasing engagement in the learning process and fostering students’ dispositions and habits of mind.** In addition, the arts encourage students to develop skills that can be applied to other disciplines, such as curiosity, collaboration, and spatial thinking skills. Experts in brain development explain that experience gained through arts participation positively impacts neurological growth.

- **Arts participation correlates positively with indicators of student success.** Research shows that students who participate in arts education show improved standardized test scores, attendance, and graduation rates, as well as reduced disciplinary incidents when compared to students with lower or no arts participation. In addition, a National Endowment of the Arts (NEA) study found that students with higher exposure to arts education are more likely to attend college and be engaged in their community.

- **Arts education that is integrated into other content areas may have a greater impact on student outcomes than standalone arts programming.** Researchers argue that arts integration helps students form connections between the arts and other subjects, and that interdisciplinary learning enhances student learning across content areas. Studies that compare integrated and standalone arts programs find that while the implementation of integrated arts programs may vary, some produce a comparatively positive effect on student achievement.

- **Researchers believe that athletics participation is a pro-social activity that fosters character growth, discipline, and the formation of positive peer relationships.** In addition, researchers find that athletics participation increases student connections to their school, and successful sports teams may lead to a greater sense of school community for all students. Scientists further note that physical activity of all forms,

including sports, physical education class, and recess, positively shapes brain development, especially in the areas of memory and learning.

- **Studies have linked athletics participation with positive student outcomes.** Sports participation at the high school level is correlated with improved standardized test scores, improved aspirations to attend college, and other indicators related to student success. In addition, studies show that physical activity of all types and at all grade levels is associated with improved student achievement.

- **The positive impact of arts and athletics participation appears to be consistent across student subgroups.** Studies find that students of low-SES or minority backgrounds benefit from arts and athletics at levels similar to the general population. Research further suggests that arts and athletics are effective ways to engage hard-to-reach student populations, such as students with disabilities, English language learners, and students from marginalized groups.
SECTION I: THE IMPACT OF ARTS PARTICIPATION

The literature on arts education typically divides the arts into four types: visual arts, music, drama/theatre, and dance. The U.S. Department of Education reports that during the 2009-10 school year, 94 percent of U.S. elementary schools offered music and 83 percent offered visual arts, and large percentages of schools reported that drama and theater were integrated into other curriculum areas, including physical education. At the secondary level, 91 percent of schools offered music, 89 percent offered visual arts, 12 percent offered dance, and 45 percent offered theater programs. Figure 1.1, below, presents data on student arts participation in U.S. public schools.

This section discusses literature on the relationship between arts participation and student outcomes, including academic achievement, graduation rates, and community engagement. Current literature presents several theoretical frameworks that identify possible causal mechanisms linking arts and student success, as well as empirical research that seeks to test those theories and measure the magnitude of that relationship.

LINKING ARTS AND ACHIEVEMENT

Researchers believe that arts education supports student achievement by increasing engagement in the learning process and fostering students’ dispositions and habits of mind. In other words, arts education teaches students the discipline to be become better

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3 Ibid.
learners. The arts encourage students to experiment, take risks, and develop flexible thinking skills. In addition, arts education is an active and participatory process that requires students to use their bodies and engage with materials and their environment. Thus, through the arts, teachers can engage typically hard-to-reach learners, such as reluctant learners, students with disabilities, and English language learners.4

Researchers frequently describe the cognitive link between arts participation and student achievement as a process of “transfer.” Through transfer, learning in one context facilitates learning in another. 5 UCLA education researcher James Catterall explains that at the neurological level, learning experiences in one context impact future learning experiences by reorganizing neural pathways, neural receptors, and the functioning of specific brain regions:

If altered neuro-function is a consequence of learning in the arts, it is reasonable to think that such neural-conditioning could enhance performance in related skills, either through improved related cognitive functioning or through positive affective developments such as achievement motivation.6

When viewed in the neurological perspective, Catterall argues, it becomes clear that learning through the arts is not a one-way affect but a reciprocal process that involves interactions across multiple domains and disciplines.7

Furthermore, students who participate in the arts learn specific skills that can be applied in other disciplines. In particular, arts education encourages students to:8

- Draw on curiosity;
- Observe accurately;
- Perceive an object in a different form;
- Construct meaning and express one’s observations accurately;
- Work effectively with others;
- Think spatially (e.g., rotating an object in one’s head); and
- Perceive kinesthetically (e.g., understanding how an object moves)

In addition, researchers believe that the benefits of arts participation may extend well beyond the classroom. For example, a 2004 report by the RAND Corporation presents an

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6 Ibid., p. 163.
7 Ibid., p. 7.
expanded framework for evaluating the benefits of arts education. Participation in the arts, the framework posits, can have both *instrumental benefits* that are seen by others and *intrinsic benefits* that are experienced by the student alone. These benefits shape the student’s private, personal growth as a person and student and may lead to positive spillover effects in their classroom and society.\(^9\) Figure 1.2, below, illustrates the framework.

![Figure 1.2: Framework for Understanding the Benefits of the Arts](image)

<table>
<thead>
<tr>
<th>INTRINSIC BENEFITS</th>
<th>INSTRUMENTAL BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Benefits</td>
<td>Pleasure</td>
</tr>
<tr>
<td></td>
<td>Captivation</td>
</tr>
<tr>
<td></td>
<td>Improved test scores</td>
</tr>
<tr>
<td>Private Benefits with Public Spillover</td>
<td>Expanded capacity for empathy</td>
</tr>
<tr>
<td></td>
<td>Cognitive Growth</td>
</tr>
<tr>
<td></td>
<td>Improved self-efficacy and learning skills</td>
</tr>
<tr>
<td>Public Benefits</td>
<td>Creation of social bonds</td>
</tr>
<tr>
<td></td>
<td>Expression of communal meaning</td>
</tr>
<tr>
<td></td>
<td>Development of social capital</td>
</tr>
<tr>
<td></td>
<td>Economic growth</td>
</tr>
</tbody>
</table>

Source: RAND Corporation\(^{10}\)

**RESEARCH ON ARTS AND ACHIEVEMENT**

Multiple empirical studies conducted over the past two decades have demonstrated a relationship between student participation in the arts and indicators of student success. For example, *Critical Links*, a 2002 report published by the Arts Education Partnership, reviewed 62 studies that measured the impact of specific arts programs (e.g., music, theater, dance) on various measures of student achievement. While many of the studies reviewed found positive impacts of arts education, the book’s authors noted several methodological shortcomings, namely the small scale of the studies reviewed and their statistical rigor.\(^{11}\)

Since the publication of *Critical Links*, however, several larger and more comprehensive studies – such as the statewide studies from Florida and Missouri that are discussed below – have confirmed and expanded the research base for using arts to promote student achievement.

Despite the increased volume and rigor of research on arts education, researchers note that available research literature can indicate correlation only, not a straightforward causal link.\(^{12}\) Therefore, it is not possible to discern, for example, whether arts education alone led to improved student achievement:

> The fact that the two types of measures are related does not necessarily imply that the former causes the latter. This problem is particularly important in studies asserting that certain cognitive benefits—especially, higher test scores—are caused


\(^{10}\) Figure text adapted from: Ibid., p. xiii.


by arts education rather than by the much greater likelihood that students from higher socioeconomic backgrounds have had arts education.\textsuperscript{13}

However, several of the studies discussed below have shown that the correlation between arts education and improved student outcomes holds across student subgroups, including students of low socio-economic status (SES) and minority racial and ethnic groups.\textsuperscript{14} While these findings alone do not explain causality, they strengthen the argument that arts education may play an instrumental, rather than coincidental, role in a student’s overall academic success.

**IMPACT ON STUDENT ACHIEVEMENT**

**Studies link increased arts participation with improved academic achievement.**\textsuperscript{15} Recent studies from Florida and Missouri, described in Figure 1.3 on the following page, illustrate how arts education may impact various measures of academic success. The 2012 study from Florida examined the academic records of all high school students in the state in the 2010-11 academic year. The study found that students who enrolled in more high school arts classes had higher overall grade point averages (GPAs) when compared to students who enrolled in fewer or no arts classes. In addition, students who took arts classes had higher scores on the Florida Comprehensive Assessment Test (FCAT) in reading, mathematics, and writing.\textsuperscript{16}

Similarly, a 2010 study from the Missouri Alliance for Arts Education used data from more than 500 public school districts in the state to examine the relationship between student test scores and the percentage of students participating in arts education at the school.\textsuperscript{17} A correlational analysis revealed Grade 6 through 8 scores on the Measures of Academic Progress (MAP) communication arts exam were three points higher in districts with “high arts” compared to districts with “low arts” participation. Further, student scores on the Grade 6 through 8 MAP mathematics exam were four points higher in the “high arts” schools.\textsuperscript{18}

\textsuperscript{13} Ibid., p. 10.
\textsuperscript{14} Ibid.
\textsuperscript{18} Ibid., pp. 15–16.
Figure 1.3: Impact of Arts Participation on Student Success in Florida and Missouri

<table>
<thead>
<tr>
<th>Population Studied</th>
<th>Florida Study</th>
<th>Missouri Study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cohort of 197,932 Grade 12 students who graduated in 2010-11</td>
<td>Students in Grades K-12 in 514 public school districts (data from the years 2007-08 to 2010-11)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measure of arts participation</th>
<th>Number of arts credits during high school</th>
<th>Percentage of students enrolled in fine arts classes</th>
</tr>
</thead>
</table>

**Impact of Arts on Achievement**

- Higher scores in reading, mathematics, and writing on the Florida Comprehensive Assessment Test (FCAT)
- Higher scores on the SAT math and verbal exams
- Higher GPAs
- Higher student scores in mathematics and communication arts on the Measures of Academic Progress (MAP) assessment in Grades 6-8
- Higher median communication arts score on the Terra Nova assessment in Grades 6-8

**Impact of Arts on Other Academic Indicators**

- Reduced drop-out rates
- Lower rate of behavior incidents that require student removal from the classroom
- Higher attendance rates
- Higher graduation rates

Source: Kelly, S., Missouri Alliance for Arts Education19

The results of the Florida and Missouri studies correspond with positive results found in other studies. For example, a longitudinal study by researchers at the University of California-Los Angeles analyzed data from the data from 25,000 Grade 8-12 students who participated in the National Educational Longitudinal Survey (NELS). The analysis showed that students who reported consistent involvement in instrumental music while in middle and high school had significantly higher levels of math proficiency when they graduated when compared to students with less or no arts participation. Further, increased theater participation was associated with improved reading proficiency.20 Similarly, a 2000 study published in the *Journal of Aesthetic Education* studied the College Board’s complete data set of student SAT test scores and Student Descriptive Questionnaires (SDQs) from 1987 and 1998.21 The analysis revealed that students who took art courses in high school had higher verbal and math SAT scores than students who did not take an art class.22

**Studies indicate that low-income and minority students benefit from arts education at rates similar to the general population.** Both the Florida and Missouri studies found that the impact of arts education was consistent across student subgroups. For example, the Florida study found the correlation of arts enrollment and higher GPA was similar among

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22 Ibid., p. 86.
high-achieving students who met the academic criteria for the state’s Bright Futures scholarship program and lower-achieving students who did not meet the Bright Futures criteria.\footnote{Kelly, Op. cit., p. 9.} Similarly, the impact on GPA remained stable when comparing students who were eligible for free or reduced price lunch (FRL) and those who were not FRL eligible, and across all racial and ethnic categories.\footnote{Ibid.} The Missouri study also found that the relationship between arts participation and positive academic indicators remained at the level of statistical significance even after controlling for district poverty levels and percentage of minority students.\footnote{“Arts Education Makes a Difference in Missouri Schools,” Op. cit., p. 18.}

**IMPACT ON OTHER ACADEMIC INDICATORS**

Research shows that arts participation correlates positively with several additional indicators related to academic achievement, including high school graduation, discipline, and attendance rates. The Missouri study, for example, found that greater arts participation was associated with fewer disciplinary incidents, higher attendance rates, and higher graduation rates.\footnote{Ibid., p. 2.} Similarly, a 2009 study published by the Center for Arts Education found that New York City high schools with the highest graduation rates were more likely to offer their students arts education than schools with the lowest graduation rates.\footnote{Israel, D. “Staying in School: Arts Education and New York City High School Graduation Rates.” Center for Arts Education, October 2009. p. 2. http://centerforartsed.org/sites/default/files/cae_arts_and_graduation_report.pdf}

In addition, research has linked arts education to indicators of post-graduation success. For example, a 2012 study published by the National Endowment for the Arts (NEA) compared high-arts, low-SES students to their low-arts, low-SES peers using data from four nationwide longitudinal studies.\footnote{Low-SES students represents the bottom quartile of students on an SES scale, while high-SES represents students in the top quartile. Catterall, Dumais, and Hampden-Thomson, Op. cit., pp. 9–10.} In addition to improved academic performance, the NEA study found that high-arts students in the sample were more likely to attend a moderately selective four-year college, earn mostly A’s in college, and earn a bachelor’s degree.\footnote{Ibid., pp. 15–16.} High-arts students also performed better on measures of community engagement, such as registering to vote, volunteering, and regular newspaper readership.\footnote{Ibid., pp. 18–21.} Figure 1.4, on the following page, presents detailed results of the NEA study.
ARTS INTEGRATION

Recently, researchers and educators have investigated the extent that arts are integrated into content area instruction, rather than treated as a separate discipline. Arts integration, experts believe, encourages students “to use higher-order thinking skills and aesthetic qualities to gain further understanding of a particular academic concept.” In practice, arts integration can take many forms and lacks a formal definition, therefore limiting the ability of researchers to measure its impact on students’ academic achievement and other indicators. In an attempt to synthesize best practices of arts integration, A. Helene Robinson (2013) presents the following definition of arts integration:

High-quality arts integration involves a curricular connection process that collaboratively engages all to promote learning through and with the arts.

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31 Figure content adapted from: Catterall, Dumais, and Hampden-Thomson, Op. cit.
33 Ibid., p. 192.
In her review of arts integration literature, published in the *Arts Education Policy Review*, Robinson identified 44 studies that examined the effect of arts integrated with one or more academic subjects. While the studies reviewed varied in terms of design and populations studied, many showed positive effects. In particular, positive effects were reported for multi-arts integration and drama integration, while potentially positive effects were reported for all other forms of arts integration. Arts integration involving students with disabilities and as a way means to improve the school environment also showed potentially positive effects.  

In addition, evaluations of individual arts integration initiatives found positive impacts of arts integration on student achievement. For example, a 2003 evaluation by researchers at the University of Minnesota examined the level of arts integration in Minneapolis Public Schools elementary classrooms. Using self-reported data from teacher surveys, the study found that students in classrooms where teachers reported they implemented arts integration “a lot” produced modestly higher gains in Grade 3 reading and math scores when compared to students with less exposure to arts integration. The relationship between arts integration and reading scores was stronger for FRL-eligible students and English language learners. 

Similarly, a 2014 study published in *The Educational Forum* compared three Los Angeles elementary schools that participated in a multi-arts integration initiative with three comparable schools that offered only standalone arts programming. The study found that arts integration schools had slightly higher percentages of students proficient in English language arts when compared to non-arts integration schools over a three-year period. The proficiency gains were even more pronounced among English language learners.  

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34 Ibid., p. 201.
36 Ibid.
38 Ibid., pp. 372–373.
SECTION II: THE IMPACT OF ATHLETICS PARTICIPATION

More than 7.8 million high school students participated in competitive athletics programs in 2014-15, according to the National Federation of State High School Associations. Many more students, including elementary and middle school students, participate in physical education classes during the school day. Figure 2.1, below, lists the most popular organized sports at the high school level.

Figure 2.1: Most Popular High School Athletics Programs

<table>
<thead>
<tr>
<th>BOYS</th>
<th>GIRLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sport: Total Participants = 4,519,312</td>
<td>Sport: Total Participants = 3,287,735</td>
</tr>
<tr>
<td>Football - 11-player</td>
<td>Track and Field - Outdoor</td>
</tr>
<tr>
<td>24%</td>
<td>15%</td>
</tr>
<tr>
<td>Track and Field - Outdoor</td>
<td>Volleyball</td>
</tr>
<tr>
<td>13%</td>
<td>13%</td>
</tr>
<tr>
<td>Basketball</td>
<td>Basketball</td>
</tr>
<tr>
<td>12%</td>
<td>13%</td>
</tr>
<tr>
<td>Baseball</td>
<td>Soccer</td>
</tr>
<tr>
<td>11%</td>
<td>11%</td>
</tr>
<tr>
<td>Soccer</td>
<td>Softball - Fast Pitch</td>
</tr>
<tr>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>Wrestling</td>
<td>Cross Country</td>
</tr>
<tr>
<td>6%</td>
<td>7%</td>
</tr>
<tr>
<td>Cross Country</td>
<td>Tennis</td>
</tr>
<tr>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Tennis</td>
<td>Swimming and Diving</td>
</tr>
<tr>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>Golf</td>
<td>Competitive Spirit Squads</td>
</tr>
<tr>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>Swimming and Diving</td>
<td>Lacrosse</td>
</tr>
<tr>
<td>3%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Source: National Federation of State High School Associations

This section explores literature on the impact of organized athletics programs, including physical education classes and after-school sports programs, on test scores, graduation rates, student discipline, and other indicators of student success.

LINKING ATHLETICS AND ACHIEVEMENT

Researchers have identified several causal mechanisms that may explain how athletics participation impacts students’ academic success. Based on several decades of prior research in the fields of sociology and brain development, the theoretical frameworks described below explore the social benefits derived from participation in organized, competitive sports and the physiological benefits of physical activity.

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40 Ibid.
HUMAN CAPITAL BENEFITS

Researchers believe that participation in organized athletic programs – especially competitive sports teams – is a pro-social activity that yields academic benefits to students. Developmental theorists suggest that athletics builds character and fosters social skills, habits, and discipline – all skills that are considered “human capital” and that are necessary for success in the classroom.\(^{41}\) Athletics programs encourage the development of human capital skills through the following:\(^{42}\)

- Regular schedules,
- Supervision and guidance by adults,
- Clear feedback,
- Activities that require sustained attention, and
- Opportunities for meaningful and autonomous participation.

Thus, researchers link athletics participation with improved homework completion and reduced absenteeism.\(^{43}\) Further, research from the field of psychology indicates that participating in sports may lead to improved mental health and self-esteem.\(^{44}\)

SOCIAL CAPITAL BENEFITS

Sociologists explain that that organized sports programs and other afterschool activities create a pro-social environment that shapes student development.\(^{45}\) While the impact of participating in such programs may be mediated by family, socio-economic, and other circumstances, after-school programs can impact a student’s values and who they choose as friends:

> It’s believed that extracurricular activities offer a means to express and explore one’s identity, generate social and human capital, and offer a challenging setting outside of academics. Adolescents form their identity by developing skills, discovering preferences, and associating themselves with others. Being a member of a particular group structures what individuals do with their time and the kinds of values and norms to which they are exposed. ... Thus, adolescents’ identity and peer group influence subsequent activity choices, shaping the nature of their developmental pathway.\(^{46}\)

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\(^{46}\) Ibid., pp. 161–162.
In addition, researchers believe that athletics participation may lead to improved academic success by fostering a sense of community and connection with the school and school peers. Researchers interviewed for a 2009 report prepared for the California non-profit Coaching Corps argued that athletics may build community in the following ways:

- Participation in sports may foster greater identification with and commitment to school and school values.
- Sports help students feel more connected to school, attend school regularly, and connect with a more positive peer network.
- High school students who are participating more in sports experience higher parental expectations.
- Athletics participation builds planning skills and provides the experience of failing and trying again (persistence); these experiences provide a learning process that can translate to feelings of greater possibility for achievement in the school setting.

By fostering an enhanced sense of community, researchers further hypothesize that school athletics programs can improve the achievement of all students in a school, in addition to the student-athletes themselves.

However, while many experts agree that organized activities such as sports impact students’ formation of peer groups, it remains unclear whether the effect is positive or negative. Some research suggests that participation in unstructured afterschool activities increases students’ risk of exposure to negative peer influences, while other studies associate participation in organized athletics and other highly competitive extracurricular activities with increased alcohol use, stress, and anxiety.

**Physiological Benefits**

Research indicates that physical activity may improve academic performance. Regular physical activity – through organized sports, physical education classes, or even recess/playtime – has been linked to improved cognitive function, including memory, concentration, and mood. As described in Figure 2.2 on the following page, scientists believe that aerobic activity supports neurological growth and stimulates neuron growth in
the region of the brain most responsible for learning and memory. Physiological stress to the brain causes the brain to adapt, leading to positive cognitive development.51

**Figure 2.2: Physiological Impact of Physical Activity on Cognitive Ability**

<table>
<thead>
<tr>
<th>IMPACT ON BRAIN FUNCTION</th>
<th>IMPACT ON COGNITIVE ABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research has shown that physical movement can affect the brain’s physiology by increasing:</td>
<td>These physiological changes may be associated with:</td>
</tr>
<tr>
<td>▪ Cerebral capillary growth</td>
<td>▪ Improved attention</td>
</tr>
<tr>
<td>▪ Blood flow</td>
<td>▪ Improved information processing, storage, and retrieval</td>
</tr>
<tr>
<td>▪ Oxygenation</td>
<td>▪ Enhanced coping</td>
</tr>
<tr>
<td>▪ Production of neurotrophins</td>
<td>▪ Reduced sensations of cravings and pain</td>
</tr>
<tr>
<td>▪ Growth of nerve cells in the hippocampus (center of learning and memory)</td>
<td></td>
</tr>
<tr>
<td>▪ Neurotransmitter levels</td>
<td></td>
</tr>
<tr>
<td>▪ Development of nerve connections</td>
<td></td>
</tr>
<tr>
<td>▪ Density of neural network</td>
<td></td>
</tr>
<tr>
<td>▪ Brain tissue volume</td>
<td></td>
</tr>
</tbody>
</table>

Source: Centers for Disease Control and Prevention52

Researchers further suggest that physical activity can be particularly beneficial for learners with special needs:

Many special-needs learners are stuck in counterproductive mental states, and movement is a quick way to change them. Second, movements, such as those involved in playing active games, will activate the brain across a wide variety of areas. It may be the stimulation of those neural networks that helps trigger some learning. For other students, it may be the rise in energy, the increased blood flow, and the amines that put them in a better mood to think and recall. Some routines that call for slower movement can do the reverse, calming down students who are overactive, hence supporting a state of concentration.53

Consequently, researchers conclude, even physical activity that is not typically considered “athletics,” such as classroom activities that incorporate movement, can improve student learning.54

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54 Ibid.
RESEARCH ON ATHLETICS AND ACHIEVEMENT

The extant empirical literature on the relationship between athletics and achievement employs varying academic and methodological approaches. Similar to research on arts participation, research into the benefits of athletics participation suffers from several methodological weaknesses, including rigor and sample size. Like arts participation literature, existing research indicates correlations, not causal relationships, between athletics participation and student outcomes.55

Researchers warn of a possible selection bias in available data on student athletes.56 For example, some experts have questioned whether high achieving students are more likely to participate in athletics. In fact, some schools require students to meet specific academic standards in order to participate in athletics. However, several of the most comprehensive and rigorous studies of athletics participation and achievement, discussed below, control for SES-status, race/ethnicity, and other student background variables. Similarly, the fact that many studies have found positive effects across student subgroups indicates that, despite the inability to determine causality, the multiple positive relationships reported in the research may not be coincidental in nature.

IMPACT ON PARTICIPANTS

In general, the literature finds a positive correlation between athletics participation and student outcomes. In particular, studies frequently report that athletics participation is associated with improved standardized test scores, improved aspirations to attend college, and persistence, especially at the high school level.57 For example, a 2003 study, published in the Journal of Sport & Exercise Psychology, is one of the most comprehensive studies to date on the relationship between athletics participation and student achievement. Using a nationally representative, longitudinal sample of 4,250 students, the study compared different types of sport participation (e.g., team vs. individual sports) and their impacts on a wide range of Grade 12 and postsecondary student outcomes.58 After controlling for student background characteristics, the study found that athletics participation had a modest, yet statistically significant, positive effect on eight Grade 12 indicators and four postsecondary indicators. Figure 2.3, on the following page, displays detailed results of the study. Notably, the study found the most positive effects concentrated among students who participated in extramural team sports. The sole negative effect on standardized test scores was concentrated among students who participated in intramural/team sports; for all other types of sports the effect was not significant.59

59 These results were for a simultaneous analysis of all four types of athletics participation: Intramural/Individual, Intramural/Team, Extramural/Individual, and Extramural/Team. A second analysis, in which the four types were analyzed separately produced similar, though not identical, results. For example, the “separate analysis” also found negative effects on standardized tests among students who participated in extramural team sports. Ibid., pp. 218, 222.
### Figure 2.3: Athletics Participation and Student Outcomes

<table>
<thead>
<tr>
<th>OUTCOMES MEASURED</th>
<th>ALL PARTICIPANTS</th>
<th>INTRAMURAL*</th>
<th>EXTRAMURAL*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Individual</td>
<td>Team</td>
</tr>
<tr>
<td>Grade 12 Indicators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standardized tests</td>
<td>Negative</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Grades</td>
<td>Positive</td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Carnegie units (time in class)</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Homework</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>TV watching</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attendance</td>
<td></td>
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</tr>
<tr>
<td>Locus of control</td>
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<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>Positive</td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Parental expectations</td>
<td>Positive</td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Educational aspirations</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Occupational aspirations</td>
<td></td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Staying out of trouble</td>
<td></td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>School preparation</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No substance abuse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University applications</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Postsecondary Indicators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Months unemployed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University enrollment</td>
<td>Positive</td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Months in university</td>
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<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Educational aspirations</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Occupational aspirations</td>
<td></td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Highest education level attained</td>
<td>Positive</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Results of simultaneous comparison of all four components

Source: Journal of Sport and Exercise Psychology\(^{60}\)

In addition, numerous studies have identified relationships between athletics participation and reduced high school dropout rates, reduced student arrest rates, and higher postsecondary wages.\(^{61}\)

**COMMUNITY IMPACT**

Studies that explore the social capital and community impact theories of athletics participation have produced mixed results. Two recent studies have explored the impact of athletics programs on the broader school community by comparing student achievement at high schools with successful athletic programs (as measured by the school’s win-loss record) and schools with less “winning” athletic programs. The first study, published in 2012 by the

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\(^{60}\) Figure data taken from: Ibid., pp. 218–219.

Journal of Research in Education, analyzed data from 657 Ohio high schools over a five-year period. The study included athletic records from the schools’ boys’ football, boys’ basketball, and girls’ basketball teams as well as their cumulative promotion index (CPI), an estimate of the school’s graduation rate. The analysis found that a 10 percentage increase in the school’s winning rate was associated with a 1.3 percentage point improvement in CPI. All three sports examined produced positive impacts on CPI, with football producing the largest impact. The number of sports a high school offered and the percentage of students participating in those sports were also associated with higher CPI.

Conversely, a second study, published in 2011 in the Global Education Journal, examined the academic achievement of 285 Alabama high schools and the win-loss records of their football teams. The study, which used standardized test results as a measure of academic achievement, concluded that the success of a school’s football team is not significantly related to achievement.

While research on the community-boosting impact of school sports remains inconclusive, it does indicate that investments of time and money in school athletics programs do not necessarily have a negative impact on the school’s academic achievement. This was the conclusion of a 2002 report published by the Brookings Institution, which examined the impact of 141 schools (called “powerhouse schools”) that rank nationally for athletic success. Across the entire sample, the powerhouse schools ranked in the 52nd percentile nationally on standardized tests, indicating that, overall, having very successful sports teams had close to no impact on achievement. However, when the study examined schools individually, several key differences emerged. The schools that benefited most from powerhouse status served predominantly white, non-Hispanic populations and were located in suburban areas. By comparison, urban powerhouse schools scored no better or worse than non-powerhouse schools, and rural powerhouse schools scored slightly worse.

IMPACT OF PHYSICAL ACTIVITY

Several studies find general physical activity and fitness to be correlated with improved cognition. For example, a 2005 study analyzed the relationship between standardized test scores of all Grade 5, Grade 7, and Grade 9 students in California and their score on the FITNESSGRAM physical fitness test. The analysis, published in the Journal of Exercise Physiology, showed that as students’ overall fitness scores improved, so did their mean reading and mathematics scores on the Stanford Achievement Test. The relationship was

63 Ibid., p. 11.
66 Ibid., pp. 26–27.
stronger for girls than boys, and stronger among higher-SES students than lower-SES students.\textsuperscript{68}

Overall, however, research into the impact of physical activity on achievement has produced mixed results.\textsuperscript{69} A 2010 review of 50 empirical studies on school-based physical activity, published by the Centers for Disease Control and Prevention (CDC) reported that 50.5 percent of the studies reviewed reported positive impacts on academic achievement. Meanwhile, 48 percent reported no association between athletics and achievement, while only 1.5 percent reported negative impacts.\textsuperscript{70} The review included studies of physical activity during recess and classroom physical activities, and concluded that research has found similarly mixed impacts for both types of activity.\textsuperscript{71}

However, researchers note that most studies of physical activity and achievement do not specify the quality or intensity of physical activity, thereby limiting the generalizability of their results.\textsuperscript{72} Despite such limitations, the CDC review concluded:

Schools should continue to offer or increase opportunities for physical activity. There is evidence that physical activity may help improve academic performance (including grades and standardized test scores) in some situations. Increasing or maintaining time dedicated to physical education does not adversely impact academic performance.\textsuperscript{73}

\textbf{GENERAL RESEARCH ON AFTER-SCHOOL PROGRAMS}

Finally, after-school programs, including sports, may have a greater impact when students participate for longer periods of time and take advantage of multiple, varied types of activities. A 2006 study published in the journal \textit{Applied Developmental Science} examined three characteristics of extracurricular activities (including sports and clubs): 1) how long students participated in the activity, 2) the number of activities in which they participated, and 3) the variability of these activity types. Using information from a longitudinal dataset that includes several hundred students, the study measured these three characteristics and their association with student academic achievement, risky behavior (e.g., alcohol use), psychological adjustment, and whether their peers encourage “academic” or “risky” behavior.\textsuperscript{74} The results of the study, which are described below in Figure 2.4, indicate that duration of participation has the most comprehensive impact on student outcomes, especially among the oldest cohort of students studied (all high school students). Students

\textsuperscript{71} Ibid., pp. 19–23.
in the two youngest cohorts (mostly middle but some high school students) exhibited fewer impacts as the characteristics changed.\textsuperscript{75}

**Figure 2.4: Characteristics of Extracurricular Activities and Student Outcomes**

<table>
<thead>
<tr>
<th><strong>Duration of Participation:</strong></th>
<th>The length of time a student participated in school clubs was associated with improved grades (all cohorts), higher sense of school belonging (youngest two cohorts), and lower alcohol use (oldest cohort). Duration of participation in sports was associated with higher alcohol use (oldest cohort) and school belonging (oldest cohort).</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Number of Activities:</strong></td>
<td>Students in the oldest cohort who participated in more extracurricular activities reported greater sense of school belonging, psychological resilience, less psychological distress, and fewer risky peers. For the youngest cohort, an increased number of activities was associated with more academic peers and fewer risky peers.</td>
</tr>
<tr>
<td><strong>Breadth of Participation:</strong></td>
<td>For the oldest cohort, breadth of participation was predictive of improved school belonging, grades, psychological resilience, and more academic peers, as well as less psychological distress and risky peers. For the two youngest cohorts, breadth of participation was associated with increased academic peers only.</td>
</tr>
</tbody>
</table>

Source: *Applied Developmental Science*\textsuperscript{76}

The results of this study align with the conclusions of other studies of extracurricular and athletics participation, which find that sports allow students to meet and interact with like-minded peers and build their self-identity. However, as noted above, studies have produced mixed results about the association of athletics participation with teen alcohol use. Researchers note that teen alcohol use is a “social phenomenon,” and therefore is more likely to be shaped by peer behavior rather than athletic activity.\textsuperscript{77}

Research into after-school programs generally, including studies involving younger students, further supports the theory that organized after-school programs have positive effects on student achievement.\textsuperscript{78} For example, 2005 study published in the journal *Child Development* examined nearly 600 elementary students in an urban, disadvantaged area who participated in different types of after-school care, including an after-school program, parent care, and care by siblings or other adults. The study found that students involved in after-school programs scored higher on indicators of academic performance and motivational attributes than students who experienced an alternative form of care.\textsuperscript{79} In particular, students in after-school programs performed better on measures of reading achievement after one year and their teachers reported higher expectations for their success.\textsuperscript{80}

\textsuperscript{75} Ibid., pp. 137–142.
\textsuperscript{76} Ibid.
\textsuperscript{80} Ibid., p. 820.
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