Patterns of Social Skill Development Over-Time Among Clusters of LiFEsports Participants

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Abstract

Although growing in prevalence, little is known about how and for whom sport-based positive youth development (PYD) programs make a difference. This study addresses two gaps: A lack of multi-year studies and limited research differentiating outcomes between groups of participants. Specifically, this study uses repeated measures ANOVAs and hierarchical and non-hierarchical modeling procedures to investigate outcomes among two clusters of underserved youth who participated in two consecutive LiFEsports summer camps. Two hundred and thirty one youth participated, with the majority African American (87%) and male (62%). The average age of participants was 10.71 years. Participants completed surveys to assess four skills: self-control, effort, teamwork, and transfer. Within the full sample, growth was seen over the course of each camp. Social skills returned to baseline levels between summers. Youth entering LiFEsports with high levels of social skills experienced some fluctuations but no significant changes in outcomes. Conversely, youth with relatively low social skills experienced more consistent and maintained growth between summers. Results support the positive impact of sport-based PYD programs on vulnerable youth and reiterate the need for a more complex understanding of the mechanisms affecting certain types of youth. Implications for sports-based PYD research and practice are drawn.

Keywords: Youth Sports; Positive Youth Development; Social Skills
Patterns of Social Skill Development among Clusters of LiFEsports Participants: Investigating the Multi-Year Impact of a Sport-Based Positive Youth Development Program

Positive youth development (PYD) programs focus on increasing protective factors, reducing risk factors, and preventing problem behaviors among youth (Anthony, Alter, & Jenson, 2009; Eccles & Gootman, 2002). Reviews and meta-analyses exploring the benefit of these programs demonstrate their value towards improving academic outcomes, decreasing substance use and delinquency, enhancing social competence, and increasing mental health (Catalano, Hawkins, Berglund, Pollard, & Arthur, 2002; Durlak, Weissberg, & Pachan, 2010; Eccles & Gootman, 2002). Sport represents a particularly promising avenue for PYD, as approximately 45 million youth in the United States participating in sport each year (The Aspen Institute, 2017). In fact, several PYD programs already leverage the power of sport. Little is known, however, about the long-term impacts of these programs and/or their relative impact on youth from different demographic characteristics, especially those from marginalized or underserved populations characterized by poverty and its correlates (Forneris, Bean, & Halsall, 2016; Martinek & Schilling, 2003). Better understanding the nuance of outcomes associated with sport-based PYD programs will contribute to their ability to promote holistic, positive youth development. To this end, this study examines one sport-based summer camp – Learning in Fitness and Education through Sports (LiFEsports) – and explores outcomes among underserved youth who attended two consecutive years of this program, as well as examines growth patterns among clusters of youth participants.

Introduction

Sport-Based PYD
Sport-based PYD programs integrate evidence-based PYD practices into sport contexts by intentionally teaching social and life skills while simultaneously promoting sport skills and athletic competencies (Anonymous, 2014; Gould & Carson, 2008; Hedstrom & Gould, 2004; Hellison, 2011; Holt, Neely, Slater, Camiré, Côté et al., 2017). For example, Girls On The Run, Inc. promotes physical, psychological, and social development through a 10-week program which also prepares young girls to participate in 5K run (girlsontherun.org; Iachini, Bell, Lohman, Beets, & Reynolds, 2017). The First Tee teaches golf in a way that emphasizes key values such as integrity, responsibility, and perseverance (thefirsttee.org; Weiss, Stuntz, Bhalla, Bolter, & Price, 2013). Programs grounded in Teaching Personal and Social Responsibility (Hellison, 2011) embed a humanistic approach in sport and physical education settings to teach values and responsibility. Other programs, such as Sports United to Promote Education and Recreation (SUPER; Danish, Forneris, & Wallace, 2005), provide curricular sessions that are completed before or after sport-specific training sessions. These and other sport-based PYD programs commonly embody key design principles such as being youth-centered, fostering initiative, teaching skills or values, creating relationships and a sense of belong, fostering climate, and having fun (Anonymous, 2016; Holt, Deal, & Smyth, 2017).

Previous research and systematic reviews demonstrate how sport-based PYD programs contribute to positive youth development, revealing outcomes such as enhanced life and social skills, moral development, goal–related skills, and personal values (Anonymous, 2016; Eime, Young, Harvey, Charity, & Payne, 2013; Lubans, Plotnikoff, & Lubans, 2012). Of note are three recent studies synthesizing research in this area. A meta data analysis of qualitative research in sport-based PYD documented physical, social, and personal outcomes, as well as process related factors such as relationships and parent involvement (Holt et al., 2017). Additionally, Hermens
et al. (2017) conducted a systematic review of life skill development sport programs for socially
vulnerable youth, demonstrating the value of these settings for promoting cognitive and social
life skills, but not emotional skills. Relatedly, a recent systematic review of TPSR physical
education programs found positive outcomes in relation to reduced problem behavior,
improvements on various academic indicators, and the development of other prosocial values
and skills (Pozo, Grao-Cruces, & Peréz-Ordás (2018).

Importantly, these contexts may be especially valuable for youth from vulnerable
circumstances, ones characterized by disadvantage, high exposure to risk and adversities, and
limited access to opportunities for prosocial involvement activities (Anonymous, 2014; Halpern,
2002; Hermens et al., 2017). Participation data, however, indicate youth from marginalized
populations participate at significantly lower rates as compared to their more advantaged
counterparts (Aspen Institute, 2017). Likewise, socio-political factors also often constrain access
to and opportunities for sport and sport-based PYD among low-income youth, in particular.
Promoting sport-based PYD in these settings, where there are limited opportunities yet increased
vulnerabilities, is increasingly important.

Although there has been an increase in research in sport-based PYD, there are still
notable limitations in the literature. Several researchers (Anonymous, 2014; Camiré & Trudel,
2013; Pozo et al., 2018) have noted that most of the research in this area involves qualitative
designs, using interviews and/or focus groups to explore stakeholder perceptions of program
design principles and perceived outcomes. Limitations have been identified in relation to the use
of post-test only or pre-post-test assessments without follow-up measures, as well as the need for
more rigorous research using mixed methods and longitudinal designs (Anonymous, 2014;
Anthony et al., 2009; Eccles & Gootman, 2003; Gould & Carson, 2008; Hermens et al., 2017;
Pozo et al., 2018). Questions also remain about whether certain youth benefit the most from exposure to sport-based PYD (Anonymous, 2016; Forneris et al., 2016; Halpern, 2002). For instance, there is some evidence to suggest some youth entering programs with poorer social skills and limited assets may benefit the most from participation (Anonymous, 2014). Others point to the value of serving youth from marginalized or underserved populations due to their increased risk for negative outcomes (Forneris et al., 2016; Fraser-Thomas, Côté, & Deakin, 2005). In fact, a recent meta-analysis conducted by Hermens et al. (2017) suggests that although “more and more research is being done…relatively few studies have been published that investigate life skills development in sports programs serving vulnerable youth” (p. 420). To make a practical difference in sport contexts, others suggest there is a need to focus on targeted audiences, so that one can ensure the specific knowledge and skills desired are transferred into real-life practice (Gordon & Doyle, 2015; Gould, 2016; Pierce, Gould, & Camiré, 2016). In light of these gaps, researchers call for more studies examining the mechanisms at work for different groups of youth and in different settings (Anonymous, 2014; Eccles & Gootman, 2003; Riley et al., 2017). Related is the need for further research exploring outcomes associated with participation in sports-based PYD programs among vulnerable groups of youth, including those living in poverty and/or of color (Anonymous, 2014; Forneris et al., 2016). These young people may benefit most from participation, yet often have limited opportunities as compared to their more advantaged peers (Bouffard, Wimer, Caronongan, Little, Dearing, & Simpkins, 2006; Pedersen & Scidman, 2005).

**LiFEsports**

LiFEsports (www.osulifesports.org) is a university- and sport-based PYD program that has been the focus of several prior investigations. The mission of LiFEsports is “to foster social
competence in youth through their involvement in sport, fitness and educational activities”
(Anonymous, 2011, pp. 2852-2853). Youth between the ages of 9 and 15 enroll in this four
week long, summer day camp on a first-come, first-serve basis. Participants, primarily African-
American urban youth living at or below the federal poverty level, are provided with free
transportation and daily breakfast and lunch. Approximately 600 youth enroll on a first-come,
first-serve basis each year, and approximately 55% of youth return each year.

Each day, youth participate in six hours of programming. Across the four weeks of
camp, youth receive 5 hours of instruction in 9 different sport activities (basketball, football,
health and fitness, lacrosse, soccer, social dance, softball, swimming, and volleyball), as well as
engage in 15 hours of play-based social skill instruction called Chalk Talk. All activities
promote the development of four key components of social competence: self-control, effort,
teamwork, and social responsibility (SETS). These are key skills and attributes nested within
social competence (Foster & Bussmann, 2008; Gresham, 1997) and are easily generalized to
other social settings such as school and home (Sheridan, Maughan, & Hungelmann, 1999).

Evidence also showcases their relationship to key youth outcomes, especially ones among
vulnerable youth, such as academic achievement, positive mental health, effective coping, and
reduced problem behaviors (Beelman, Pfingston, & Losel, 1994; Buckner, Mezzacappa, &
Beardslee, 2009). Further, there is a specific focus throughout the curriculum on the transfer of
SETS to other social settings such as home, school, and the community. Transfer, or the
application of the skills outside of LiFEsports, is encouraged throughout the program, and youth
participants are regularly asked to debrief and provide specific examples of their transfer of
learning during daily program activities. During the final days of camp, youth participate in the
LiFEsports Games, a culminating event involving a team-based competition that allows the youth to demonstrate their mastery of sport skills and SETS application.

During the initial years of LiFEsports curriculum development, Anonymous (2013) examined pre- to post- changes in social and athletic competence among youth. Results demonstrated significant improvements in perceptions of athletic competence in five sports, but no significant changes in perceptions of social competence. As the program was further refined, results have been more favorable. For instance, Anonymous and colleagues (2017) found significant increases in self-control from pre- to post LiFEsports participation but did not show significant differences in externalizing behaviors. Most recently, Anonymous (in review) found significant improvements in all outcome variables over the course of the camp, with small effect sizes found for self-control, effort, social competence and transfer and moderate effects for teamwork and social competence.

To better understand the LiFEsports design and implementation processes, Riley and Anderson-Butcher (2012) examined parent/caregiver perspectives using a grounded theory, qualitative study. When asked about participation outcomes, parents/caregivers highlighted benefits such as individual biopsychosocial development, family support, reduced risk exposure, and newly fostered community norms and support. Parents/caregivers also were asked to attribute these outcomes to program aspects, and noted example mechanisms such as positive counselor-youth relationships, opportunities for positive and diverse peer-interactions, and the exposure of youth to new, safe experiences and environments (Riley & Anderson-Butcher, 2012).

Later studies employed more rigorous research methods to explore pre- to post- camp outcomes. Anonymous (2014) used growth curve modeling and found significant group-level
differences in perceptions of social responsibility but not in any of the other measured social
skills. Authors pointed to considerable individual-level variation in the rate and direction of
change as one reason why significant group level differences were not found. Additional
analyses suggested that youth who enrolled with less favorable perceptions of their social
competence demonstrated greater rates of positive change over the course of the program. As
youth gains were partially dependent on initial perceptions of critical constructs, findings suggest
that future research should investigate youth outcomes in relation to initial skill levels. Further,
in addition to more rigorous methods to pre- and post-data collection, standardizing the type of
data collected during camp over time will permit the investigation of how initial skill level
differences might be impacted over the course of multiple summers, something that has not
previously been possible.

In reflection, LiFEsports-centric and other sport-based PYD research continue to have
limitations, as few studies have explored long-term outcomes among youth participants. To
better understand for whom these programs are most beneficial, further investigations need to
examine growth patterns among different youth, with specific attention paid to those who may
enter programs with deficiencies in certain areas. As such, the purpose of this study is to explore
outcomes among youth participating in LiFEsports, specifically examining changes in self-
control, effort, and teamwork. Patterns of change in self-reported transfer also were explored as
transfer is critical for the generalization of social skills (Gresham, 1997, Pierce, et al., 2016) and
a key curricular focus in LiFEsports. In the current study, these outcomes will be examined for
the first time over the course of two summer’s involvement; therefore allowing for greater
understanding of how changes seen in youth during a single summer are influenced by
subsequent camp experiences. Finally, analyses were designed to allow for comparisons between
groups of youth. By seeking to understand long-term impacts and beginning to differentiate those impacts among diverse youth, this study more broadly aims to advance the research available about sport-based PYD programs.

**Methods**

Data were collected during the LiFEsports camps occurring in the summers of 2013, 2014, and 2015. Consistent with the design of the LiFEsports program, each summer’s camp lasted a month (19 week days), exposing youth to 60 hours of sport and social skill instruction.

**Procedure**

Each year parents and guardians of LiFEsports participants were given a verbal overview of the study at program registration and asked if they were interested in having their child participate. All campers who had parents provide consent completed pretest surveys on the first day of camp and posttest surveys during the final two days of camp. Respondents took approximately 30-45 minutes to complete the battery of instruments. All youth could ask clarifying questions. Some participants required further assistance with reading the items. All study procedures were approved by the University Institutional Review Board.

**Participants**

As the aim of the current study was to investigate campers’ initial growth and maintenance of skills over the course of two summer sessions, only campers who met the following criteria were included in data analyses: (a) first attended camp in 2013 or 2014 (b) returned to camp for a second year immediately following the first, (c) attended camp on at least 15 of the 19 days during each summer session, (d) completed surveys at all four time points, and (e) reported being honest in completing the surveys. Also, it should be noted that youth 14 years of age and older provided assent.
In the 2013, there were 751 LiFEsports participants, of which 711 had parent/guardian consent (95%). Of these youth with consent, 528 were first year campers. Of these first year campers, 201 returned to camp in 2014 (or 38.1% of first year campers). Of these youth who attended in both 2013 and 2014, 122 youth had complete data at Time 1, Time 2, Time 3, and Time 4. As such, these 122 youth represent the 2013-2014 cohort, and include 59.8% of the youth with complete data attending both summers. In 2014, there were a total of 569 LiFEsports participants, of which 531 had parent/guardian consent (93.3%). Of these youth with consent, 309 were first year campers. Of these first year campers, 201 returned to camp in 2015 (or 65.0% of first year campers). Of these youth who attended in both 2014 and 2015, 109 youth had complete data at Time 1, Time 2, Time 3, and Time 4. As such, these 109 youth represent the 2014-2015 cohort, and include 54.2% of the youth attending both summers. Please note 7 youth across both cohorts total were removed from the study for reporting they were not honest when completing their surveys.

The final participant sample totaled 231 youth, including 122 campers from the first cohort (2013-2014) and 109 campers from the second cohort (2014-2015). The total sample included 143 boys and 88 girls between the ages of 9-14 (M age at first collection = 10.71, SD = 1.48) and had on average just completed 5th grade (M grade completed at first collection = 4.92, SD = 1.54). Participants self-reported a variety of ethnic backgrounds (87.0% African American, 6.9% Latino, 3.9% Caucasian, and 2.2% other). Prior to the start of each year’s camp, youth were stratified by age and gender and then randomly assigned to summer camp groups.

Measures

Self-control. Self-control in sport was assessed using the Social Sports Experience Scale (Anonymous, 2010). The items assess participants’ perceptions of their ability to regulate their
emotions in sports. Some example items include “I control my temper when I play sports,” and
“I play sports fairly even when an adult is not around.” Responses fell along a 5-point Likert
scale ranging from 1 (Not at all true) to 5 (Really true). The Social Sports Experience Scale
demonstrated acceptable internal consistency reliability in this study, with alphas ranging from
0.81-0.90 for each assessment period. Additional psychometric support for this measure was
found by McDonough, et al. (2013).

**Effort.** The commitment subscale of the Multidimensional Sportspersonship Orientations
Scale (MSOS-25) was used to measure effort in sport (Vallerand, Brière, Blanchard, &
Provencher, 1997). This subscale consisted of five items assessing participants’ perceptions of
their commitment to sports participation (i.e., “I don’t give up even after making many
mistakes”). Responses fell along a 5-point Likert scale ranging from 1 (Doesn’t correspond to
me at all) to 5 (Corresponds to me exactly). Internal consistency reliability was demonstrated in
this study, with alpha ranging from 0.74-0.87 for each assessment time.

**Teamwork.** Teamwork in sport was measured using The Teamwork Scale for Youth
(Lower, Newman, & Anderson-Butcher, 2015). The scale is comprised of items assessing
participants’ perceptions of different aspects of teamwork in the sport context. The stem “When
playing sports…” is followed by several items such as “I think teamwork is important” and “I
feel confident in my ability to work in a team.” The 8-item measure employs a 5-point Likert
scale ranging from 1 (Not true at all) to 5 (Really true). Internal consistency reliability was
demonstrated in this study, with alpha ranging from 0.78-0.87 for each measurement time.

**Transfer.** The scale used to measure transfer was designed for and used in previous
LiFEsports evaluations and research (Anonymous, 2013). The three items in this scale ask youth
about the extent to which they apply skills used in sports to other contexts in their lives (e.g.,
“The skills I learn in sport are useful to me in other parts of my life.”) Responses are given on a 5-point Likert scale ranging from 1 (Not true at all) to 5 (Really true). Internal consistency reliability was demonstrated in this study, with alphas ranging from 0.71-0.87 for each assessment period.

**Data Analysis**

Data analysis involved several steps. Descriptive statistics for all relevant study variables were computed and screened for linearity and normality, and Cronbach's alpha analyses were conducted to assess the internal consistency of each subscale at each time point. Additionally, hierarchical and non-hierarchical modeling procedures were employed for cluster analysis. After determining the appropriate number of clusters, cases were placed into appropriate groups and four repeated measures ANOVAs were conducted for each of the outcome variables in question (Self-control, Effort, Teamwork, and Transfer). For each repeated measures ANOVA, the four time points served as the within subject variable and cluster served as the between subject variable. For each of these initial repeated measures ANOVAs, a test of sphericity was conducted. If the assumption of sphericity was met, the multivariate tests were reported. If the assumption of sphericity was not met, within-subject effects were reported. If the interaction between time and cluster was significant, additional repeated measures ANOVAs were conducted for each cluster individually to determine where, if any, changes occurred over the four time points. In these additional repeated measures ANOVAs, follow-up Bonferroni post-hoc tests were used to understand where differences in the clusters existed while also adjusting for multiple comparisons. It is important to note that for each of the repeated measures ANOVAs, the number of individuals in each analysis differed as only youth who had completed subscales for each of the four time points were included.
Results

Descriptive Statistics and Scale Reliabilities

Means and standard deviations are presented in Table 1. All measures showed adequate reliability (a > 0.70). Visual inspection of the means for the total sample suggested that for each outcome variable, the total sample experienced a gain across each year of camp with scores returning to pre-Time 1 scores for the pre-Time 2 testing period. This change indicates that the growth of each construct was lost across the school year when examining data among the entire sample. When investigating growth effects across the youth clusters, it appeared that the clusters of at-risk youth experienced consistent growth across the two years in several variables, while the high-achieving clusters either maintained their high levels or experienced slight decreases in perceptions of the constructs. Further analyses were warranted for the total sample, as well as for each cluster.

Table 1: Means and Standard Deviations for all study variables at each time point for Total Sample, Cluster 1, and Cluster 2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total (N = 232) Mean</th>
<th>Total SD</th>
<th>Cluster 1 (n = 159) Mean</th>
<th>Cluster 1 SD</th>
<th>Cluster 2 (n = 73) Mean</th>
<th>Cluster 2 SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Control T1</td>
<td>4.26</td>
<td>.72</td>
<td>4.63</td>
<td>.35</td>
<td>3.49</td>
<td>.72</td>
</tr>
<tr>
<td>Self-Control T2</td>
<td>4.29</td>
<td>.73</td>
<td>4.52</td>
<td>.57</td>
<td>3.77</td>
<td>.77</td>
</tr>
<tr>
<td>Self-Control T3</td>
<td>4.21</td>
<td>.70</td>
<td>4.39</td>
<td>.63</td>
<td>3.83</td>
<td>.74</td>
</tr>
<tr>
<td>Self-Control T4</td>
<td>4.26</td>
<td>.64</td>
<td>4.35</td>
<td>.59</td>
<td>4.02</td>
<td>.71</td>
</tr>
<tr>
<td>Effort T1</td>
<td>4.11</td>
<td>.74</td>
<td>4.43</td>
<td>.48</td>
<td>3.40</td>
<td>.74</td>
</tr>
<tr>
<td>Effort T2</td>
<td>4.26</td>
<td>.81</td>
<td>4.49</td>
<td>.66</td>
<td>3.73</td>
<td>.87</td>
</tr>
<tr>
<td>Effort T3</td>
<td>4.13</td>
<td>.74</td>
<td>4.24</td>
<td>.73</td>
<td>3.92</td>
<td>.74</td>
</tr>
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</tr>
<tr>
<td>Effort T4</td>
<td>4.26</td>
<td>.67</td>
<td>4.32</td>
<td>.65</td>
<td>4.14</td>
<td>.70</td>
</tr>
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<td>-----</td>
</tr>
<tr>
<td>Teamwork T1</td>
<td>3.95</td>
<td>.70</td>
<td>4.31</td>
<td>.41</td>
<td>3.19</td>
<td>.55</td>
</tr>
<tr>
<td>Teamwork T2</td>
<td>4.11</td>
<td>.77</td>
<td>4.39</td>
<td>.57</td>
<td>3.53</td>
<td>.81</td>
</tr>
<tr>
<td>Teamwork T3</td>
<td>3.97</td>
<td>.67</td>
<td>4.13</td>
<td>.63</td>
<td>3.70</td>
<td>64</td>
</tr>
<tr>
<td>Teamwork T4</td>
<td>4.09</td>
<td>.70</td>
<td>4.22</td>
<td>.66</td>
<td>3.75</td>
<td>.72</td>
</tr>
</tbody>
</table>

| Transfer T1 | 4.02 | .86 | 4.34 | .65 | 3.33 | .87 |
| Transfer T2 | 4.22 | .87 | 4.47 | .71 | 3.66 | .95 |
| Transfer T3 | 4.06 | .90 | 4.25 | .82 | 3.63 | .96 |
| Transfer T4 | 4.14 | .83 | 4.23 | .78 | 3.82 | .92 |

**Cluster Analysis**

Both hierarchical and non-hierarchical cluster techniques were used to determine the best cluster solution (e.g., Hair & Black, 2000) with the four initial variables (Self-control, Effort, Teamwork, and Transfer) serving as the grouping variables. First, a hierarchical cluster analysis — using Ward’s linkage method and squared Euclidean distance as the similarity measure — was conducted to provide guidance as to the number of clusters that best represented the data. Examination of the agglomeration coefficients resulting from this analysis showed that the percentage change in coefficient was smallest following the two-cluster analysis, suggesting that the two-cluster solution was ideal for this sample. Next, k-means cluster analysis was used to
finalize the cluster solution. This two-cluster solution identified conceptually coherent groups
with good variability in the groups, thus meeting both statistical and common-sense criteria.

Means and standard deviations for both clusters for all time points are represented in
Table 1. Label names were assigned to profiles based on the initial scores on the self-control,
effort, teamwork, and transfer scales. Two clear clusters emerged with one group scoring high
on all four variables ("high achievers") and one group scoring lower on all four variables ("at-
risk"). The reader is cautioned that the labels employed are designed to ease the negotiation of
the remaining sections and are not intended to characterize the groups in absolute terms. As is
often the case in research with youth participants, relatively low or high scores on constructs may
not correspond to low or high response set values. For example, the profile for the at-risk group
still exhibits scores above the mean average for each of the four grouping variables. This group
was named "at-risk" because even though the scores were above the mid-point, the cluster was
clearly differentiated from the other group labelled "high achieving." These groups were entered
into each of the following repeated measures ANOVA as a between subjects variable and, in
addition to the total sample, results will be discussed in relation to these clusters.

**Self-Control.** A two-way repeated measures ANOVA was conducted to compare the
effect of time on self-control at Pre-year 1, Post-year 1, Pre-year 2, and Post-year 2. The initial
test of sphericity was not met, therefore the within-subjects effects are reported. The main effect
of time was not significant, \( F(3, 150) = 1.32, p > .26, \eta^2 = .01 \). This finding indicates that the
sample as a whole did not experience any differences in self-control at any of the four time
points. Investigation of the main effect for cluster was significant, \( F(1, 152) = 72.11, p < .001, \eta^2 = .32 \). As expected, the high achievers had higher levels of self-control than the at-risk youth.

Finally, the Time X Cluster interaction was significant, \( F(3, 150) = 15.65, p < .001, \eta^2 = .09 \).
The change in self-control over the two-year time period varied as a function of cluster. In general, youth in the high achieving group experienced decreases in self-control while youth in the at-risk group experienced increases in self-control (see Figure 1).

To investigate if these time-point differences in self-control were statistically significant in each of the two groups, a one-way repeated measures ANOVA was conducted for each group. The repeated measures ANOVA for the at-risk group was significant, $F(3,39) = 5.34, p < .01$, $\eta^2 = .29$. Follow-up Bonferroni post-hoc tests indicated that self-control at Time 1 was significantly less than at Time 3 and Time 4. No other Time points differed. The repeated measures ANOVA for the high achieving group also was significant, $F(3,109) = 9.03, p < .001$, $\eta^2 = .20$. Follow-up Bonferroni post-hoc tests indicated that self-control at Time 1 was significantly higher than at Time 3 and Time 4. Further, self-control at Time 2 was significantly higher than at Time 4. In sum, these results indicate that youth in the at-risk group achieved significant growth during camp and maintained that increase across time. Youth in the high achieving group maintained high levels of self-control across the first year of camp but saw a significant decline following the first year of camp that stayed at this lower level through the second year of camp.
Figure 1. Changes in self-control over two years for at-risk and high achieving groups.

**Effort.** A two-way repeated measures ANOVA was conducted to compare the effect of time on effort at Pre-year 1, Post-year 1, Pre-year 2, and Post-year 2. The initial test of sphericity was met, therefore the multivariate tests are reported. The main effect for time was significant, $F(3, 153) = 7.79, p < .001, \eta^2 = .13$. Follow-up Bonferroni comparisons indicated that Time 1 was significantly lower than Time 2, Time 3, and Time 4. No other differences in Time were significant. The main effect for cluster also was significant, $F(1, 153) = 41.81, p < .001, \eta^2 = .21$. As expected, the high achievers had higher levels of effort than those youth classified as at-risk.

Finally, the Time X Cluster interaction was significant, $F(3, 153) = 13.76, p < .001, \eta^2 = .21$.

Youth in the at-risk group saw a consistent increase in their effort levels across the two-year period, where youth who were high achieving saw maintenance or slight decreases in their effort across the two-year time period (see Figure 2).
To investigate if these differences in effort were statistically significant in each of the two groups, a one-way repeated measures ANOVA was conducted for each group. The repeated measures ANOVA for the at-risk group was significant, $F(3,43) = 7.75, p < .001$, $\eta^2 = .35$. Follow-up Bonferroni post hoc tests indicated that effort at Time 1 was significantly lower than at Time 2, Time 3, and Time 4. No other Times were significantly different. The repeated measures ANOVA for the high achieving group also was significant, $F(3, 108) = 5.00, p < .01$, $\eta^2 = .04$. Bonferroni follow up tests indicated that the only difference in the four time points was at Time 2. Time 2 effort was higher than Time 3, however no other times differed from each other. These results indicate that those individuals classified at-risk experienced an increase from Time 1 to Time 2 and maintained the higher levels of effort, while the group classified as high achievers maintained a relatively stable level of effort across the two years.

![Effort Graph](image)

*Sample Question: I don’t give up even after making many mistakes.*

Figure 2. Changes in effort over two years for at-risk and high achieving groups.
**Teamwork.** A two-way repeated measures ANOVA was conducted to compare the effect of time on teamwork at Pre-year 1, Post-year 1, Pre-year 2, and Post-year 2. The initial test of sphericity was met, therefore the multivariate tests are reported. The main effect of time was significant, $F(3, 152) = 5.25, p < .01, \eta^2 = .09$. Follow-up Bonferroni comparisons indicated that Time 1 was significantly lower than Time 2, Time 3, and Time 4. No other differences in Time were significant. Investigation of the main effect for cluster was significant, $F(1, 152) = 80.22, p < .001, \eta^2 = .34$. As expected, the high achievers had higher levels of teamwork than the youth classified as at-risk. Finally, the Time X Cluster interaction was significant, $F(3, 152) = 13.17, p < .001, \eta^2 = .21$. The change in teamwork over the two-year time period varied as a function of cluster. In general, youth in the high achieving group experienced decreases in teamwork while youth in the at-risk group experienced increases in teamwork (see Figure 3).

To investigate if these differences in teamwork were statistically significant in each of the two groups, a one-way repeated measures ANOVA was conducted for each group. The repeated measures ANOVA for the at-risk group was significant, $F(3,41) = 6.21, p < .001, \eta^2 = .31$. Follow-up Bonferroni post-hoc tests indicated that teamwork at Time 1 was significantly less than at Time 3 and Time 4. No other Time points differed. The repeated measures ANOVA for the high achieving group also was significant, $F(3,109) = 7.78, p < .001, \eta^2 = .18$. Follow-up Bonferroni post-hoc tests indicated that teamwork at Time 1 was significantly higher than at Time 3. Additionally, teamwork at Time 2 was significantly higher than teamwork at Time 3 and Time 4. In sum, these results indicate that youth in the at-risk group achieved a significant growth during camp and maintained that increase over time. Youth in the high achieving group maintained a high level of teamwork in the first year of camp, but then saw a significant decline between years of camp with lower levels of teamwork during their second year of camp.
Figure 3. Changes in teamwork over two years for at-risk and high achieving groups.

**Transfer.** A two-way repeated measures ANOVA was conducted to compare the effect of time on transfer at Pre-year 1, Post-year 1, Pre-year 2, and Post-year 2. The initial test of sphericity was not met, therefore the within subjects effects are reported. The main effect of time was not significant, $F(3, 157) = 2.50, p > .05$. $\eta^2 = .02$. This finding indicates that the sample as a whole did not experience any differences in self-reported transfer at any of the four time points. Investigation of the main effect for cluster was significant, $F(1, 157) = 43.23, p < .001$, $\eta^2 = .22$. As expected, the high achievers had higher levels of self-reported perceived transfer than the youth classified as at-risk youth. Finally, the Time X Cluster interaction was significant, $F(3, 157) = 6.87, p < .001$, $\eta^2 = .04$. The change in transfer over the two-year time period varied as a function of cluster. In general, youth in the high achieving group experienced
decreases in transfer while youth in the at-risk group experienced increases in transfer (see Figure 4).

To investigate if these differences in transfer were statistically significant in each of the two groups, a one-way repeated measures ANOVA was conducted for each group. The repeated measures ANOVA for the at-risk group was non-significant, $F(3,42) = 2.16, p > .10$, $\eta^2 = .13$. The at-risk group did not differ in their perspectives of transfer over the two years. The repeated measures ANOVA for the high achieving group was significant, $F(3,111) = 5.30, p < .01$, $\eta^2 = .13$. Follow-up Bonferroni post-hoc tests indicated transfer perceptions at Time 2 were significantly higher than transfer at Time 3 and Time 4. In sum, the at-risk group did not experience growth or decline over the two years of camp while the youth in the high achieving group experienced a decrease following the first year of camp that stayed at these lower levels across the second year of camp.

**Figure 4** Changes in transfer over two years for at-risk and high achieving groups.

*Sample Question: The skills I learn in sport are useful to me in other parts of my life.*
Discussion

Altogether, this study captured a more nuanced picture of the impact of sport-based PYD programs than was previously available. Survey responses from participants attending two consecutive LiFEsports summer camps were analyzed to understand the program’s impact on the development of four social skills (self-control, effort, teamwork, and transfer). The descriptive statistics among the full sample demonstrate a jump in each skill over the first summer, followed by a drop back to pre-camp levels by the beginning of the second year of camp, and then a similar jump during the second summer. This observation supports the increasingly accepted observation that sport-based PYD programs can have short-term, positive outcomes (Anonymous, 2016; Eime et al., 2013; Lubans et al., 2012).

While most research has stopped here, this study went further to explore the patterns in outcomes across two years and tease apart differences between participant clusters in the development of key social skills (self-control, effort, teamwork, and transfer). Analysis of hierarchical and non-hierarchical cluster groups offered a detailed picture of what happened to two groups during their time in LiFEsports. Youth who were identified as at-risk, or who entered camp with lower perceptions on the constructs, experienced an increase during camp in self-control, effort, and teamwork which was then maintained across the two-year time period. Conversely, the high-achieving group, or group that entered camp with higher perceptions on all constructs, experienced some fluctuations across the variables and in some cases experienced a decrease in perceptions following the first year of involvement.

The trends observed within the cluster identified as ‘at-risk’ showcase the long-term importance of participation among youth with poorer social skills. For three of the four social skills measured (i.e., self-control, effort, and teamwork), these youth improved during their first
camp, maintained growth between summers, and then maintained skills or continued to grow
during their second year of participation. This finding is consistent with other research
demonstrating the greatest effects of social skills interventions on youth from the most at-risk
groups (Beelman et al., 1994). As continued growth during the second year’s camp was
observed in only one social skill (i.e., effort), it may be beneficial for LiFEsports and other sport-
based PYD programs to consider differentiating programming for long-term and repeating
participants as a way to further enhance their impact.

Youth who entered the program with more favorable perceptions, when teased apart, did
not grow in social skills and also showed some reductions in skills over the measurement period.
Further investigation is needed to understand these patterns, as they might reflect methodological
limitations (e.g., ceiling effects, regression to the mean) and/or differences in the experience of
and mechanisms affecting these youth.

The conclusion that program outcomes differed by cluster resonates with past research
suggesting multiple and varied paths to PYD (Fraser-Thomas, Côté, & Deakin, 2005;
Anonymous, 2014). Côté and colleagues (2014) demonstrated that different sports impact youth
via different mechanisms. Even with a single sport setting, individual experiences and outcomes
can vary, for example as a function of staff practices (Riley et al., 2017). Anonymous and
colleagues (2014) also found that individual variability in perceptual changes across the course
of camp appeared to help explain the lack of significant group-level change. This same pattern
was noted in the current study, with no overall group differences noted in self-control or transfer.

In general, transfer was the least influenced of the target skills measured in this study.
Although transfer is not one of the official SETS emphasized at LiFEsports, debriefing activities
at camp do encourage the application of skills in other settings outside of camp. The limited
change in transfer observed, however, may reveal a need to more explicitly identify transfer as a
program goal, as other research has revealed that transfer is not automatic but must be taught
(Foster & Bussmann, 2008; Gresham, 1997; Ogilvey, 2006). In fact, a recent review and model
of life skills transfer through sport programing reveals that life skills transfer is influenced by
personal assets and autobiographical experiences of participants, the learning environment with
distinctive demands, program designs, and coach characteristics and strategies, and the transfer
context itself (Pierce et al, 2016). Future studies should explore this important issue.

Implications

Results support the importance of sports-based PYD for underserved youth, as scores
across the entire sample grew during camp, returned back to pre-camp levels, and then jumped
again during the second year of involvement. These findings point the short-term value of
programs for promoting social competence. Investments in programs are important for
promoting PYD among youth in the summer months. Because favorable perceptions do not
sustain over-time for the entire group and there was no growth in transfer, staff implementing
programs should consider implementing follow-up booster sessions after camp is over to help
sustain learning and promote application. Additionally, findings suggest there are different
program effects for at-risk versus high-achieving clusters of youth. More specifically, the at-risk
group (i.e., cluster with less favorable scores at Time 1) grew over-time in their perceptions of
the various SETS. The high-achieving group’s perceptions, however, remained stable (such as
with effort) or decreased over-time. These findings have implications for serving more socially
competent youth who enter sport-based PYD programs. Staff running programs need to take
engage returning youth with different curriculum, ones with lesson plans targeting more
advanced social skill development. Strategies may also include designing the programs so that
more socially competent youth may be involved as leaders with identified learning goals focused
on being mentors and/or role models. In the end, however, the current results demonstrate how 
the LiFEsports program had the most impact on these vulnerable youth (i.e., the ones who need 
the program the most).

While this study did not measure risk exposure, other research would suggest that youth 
with poorer social skills often are exposed to greater levels of risk than their peers with higher 
levels of social skills (Beelman, et al., 1994). In fact, researchers (e.g., Anonymous, 2013; 
McDonough et al., 2013) have found high levels of social skills among sport-based PYD 
participants, which may showcase selection effects if indeed youth with greater resources (and 
more favorable social skills) are more likely to attend. Certainly this necessitates attention from 
program providers, who may not be reaching the youth who both need and might benefit most 
from their programs as currently designed.

Additionally, broader environmental and family risks experienced by many vulnerable 
youth also may constrain access to opportunities for PYD. For example, economically 
disadvantaged neighborhoods are often characterized by structural barriers such as limited 
physical space and facilities, poor lighting, high crime rates and safety concerns, and inadequate 
funding (Ainsworth, Wilcox, Thompson, Richter, & Henderson, 2003; Casey, Ripke & Huston, 
2005; Pedersen & Seidman, 2005). Because of such factors, lower participation rates in 
traditional sport and sport-based PYD programs are noted among youth from lower income 
and/or less-educated families (Aspen Institute, 2017). Although rarely a component of sport-
based PYD programs, efforts focused on strengthening communities and their infrastructures, 
promoting social justice, addressing social and economic inequalities, and fostering 
empowerment are needed within program designs to address the broader social, political, and 
economic contexts where these youth live (Coakley, 2016).
Limitations

This study has limitations which must be weighed when interpreting the findings. For example, this study examined youth enrolled in a single, ‘real-life’ program context with no control or comparison group, and youth self-selected into both the program and the research. Even so, the sample included an often understudied group of youth, and the cluster analyses permitted some degree of comparison among participants. Likewise, selection criteria only included youth with complete data over the four measurement times. Missing data was an issue. As in many youth programs (Hellison & Wright, 2003), retention also was a concern. Further, this study expanded on the traditional pre- and post-study design by considering two years of data for participants. The longitudinal nature of this study, however, also increased the possibility of attrition, as some youth did not return for a second summer or did not have consent for a second year of research. Combining two cohorts allowed for a larger sample size, though also introduces an uncontrolled source of variability in program exposure, as camp is not a controlled environment, constant from year to year. In addition, it was not possible to account for the experiences of the youth during the academic year between camps. An additional possible limitation deals with the changes seen in the two groups across the two summers. It is possible that the changes seen in each group, that is increases in a majority of the skills for the at-risk group and relative stability or slight decreases in the high-achieving group, may be due in part to regression to the mean. As the at-risk group seemed to consistently gain in a majority of the constructs while only slight decreases were seen in the high-achieving group we feel this is unlikely, but the results should be interpreted cautiously until further studies can help understand these changes. Finally, there were some limitations related to the measures. Foremost, the measures relied on youth self-report and did not assess one of the four main skills targeted by
LiFEsports (i.e., social responsibility). Assessments by significant others such as parents and/or coaching staff may be more objective assessment of skills and competencies, and development of a reliable, valid measure of social responsibility in youth is needed. Additionally, ceiling effects were evident, especially among the youth who entered the program with more favorable perceptions of their skills. Future scale construction work should work to further improve the measures, especially for use within research on youth with more developed social skills.

Conclusions

Implications can be drawn from this study despite its limitations. Foremost, this study adds to a growing body of literature demonstrating that different mechanisms work for different youth within the broad context of sport-based PYD. As the general conclusion that sport-based PYD programs are impactful is consistently upheld, researchers should shift their focus to understanding and leveraging these differential mechanisms. For example, experimental studies with treatment and control conditions are needed to better understand what aspects of program design make a difference and for whom. Qualitative research is also warranted in order to explore how specific groups experience and ascribe meaning to program participation, including youth entering programs with both high and low levels of targeted skills.

Even as the mechanisms behind these programs need to be further teased apart, this study affirms that sport-based PYD programs can promote social skills development among youth with otherwise low levels of these skills. Programs should intentionally recruit youth from high risk communities who may lack pro-social opportunities, employ retention strategies to maintain long-term youth involvement; and tailor programming to account for the skill level and past participation of youth. Adopting evidence-based practices such as these will contribute to the
ability of sport-based PYD programs to increase protective factors, reduce risk, and generally promote the well-being of youth.
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