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Social Connection and Psychological Outcomes in a Physical Activity-Based Youth Development Setting

Sarah Ullrich-French, Meghan H. McDonough, and Alan L. Smith

It is believed that the social connections formed by participating in physical activity-based positive youth development (PYD) programs contributes to building personal and social assets. In this study, we examined how changes in social connection over a physical activity-based PYD program for low-income youth were associated with changes in psychological outcomes. Participants (N = 197) completed pre- and postprogram questionnaires assessing leader support, social competence, physical competence, and psychological outcomes (global self-worth, physical self-worth, attraction to physical activity, and hope). Social competence, physical competence, physical self-worth, and global self-worth increased significantly over the 4-week program. Changes in social connections predicted changes in psychological outcomes. Effect sizes were modest but suggest that social interventions hold potential to promote positive outcomes in underserved youth.

Key words: adolescent, low-income youth, positive youth development

Positive Youth Development (PYD) is a field of inquiry and practice that targets growth in attributes, skills, competencies, and potentials for success among youth in all life domains (Benson, Scales, Hamilton, & Sesma, 2006; Damon, 2004). In contrast with prevention-oriented approaches that focus on avoiding or minimizing negative behaviors, such as inactivity, substance use, violence, bullying, and inappropriate sexual behavior, PYD emphasizes building youth potential to be competent and successful (Danish, Forneris, Hodge, & Heke, 2004). PYD theory is grounded in developmental systems theory (Ford & Lerner, 1992) and based on the assumptions: (a) development is a dynamic process that occurs through an individual's interaction with contexts such as family,

school, and community, and (b) everyone has the potential to change (Lerner, Brentano, Dowling, & Anderson, 2002). Personal and social assets (e.g., interpersonal skills, positive self-perceptions, motivation, etc.) contribute to young peoples' physical, intellectual, psychological and emotional, and social development (Eccles & Gootman, 2002; Fraser-Thomas, Côté, & Deakin, 2005). A core idea of PYD is that access to opportunities designed to foster key developmental assets is critical for youth. Accordingly, there is much interest in how contexts can be configured to offer such opportunities (Benson et al., 2006).

PYD opportunities are vital to low-income youth who are disadvantaged in multiple arenas, notably academics and physical health (Chaloupka & Johnston, 2007; Kroenke, 2008; Votruba-Drzal, 2006). It has been proposed that these disadvantages are largely linked to adverse conditions characterized by an absence of resources, such as opportunities to be physically active (see Kroenke, 2008). Low socioeconomic status (SES) youth are at risk for negative health consequences (e.g., overweight/obesity) because of the numerous barriers to health-promoting behaviors, such as physical activity (Goodman, Slap, & Huang, 2003; Yang, Lynch, Schulenberg, Diez Roux, & Raghunathan, 2008). Physical activity is linked with academic achievement (Centers for Disease Control and Prevention [CDC], 2010) and physical health

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(U.S. Surgeon General, 2005) and, therefore, offers an avenue to address multiple components of well being for such at-risk groups. Hence, low SES youngsters may benefit from opportunities to participate in well designed PYD programs that help them overcome environmental barriers to physical activity and build personal and social assets (Eccles & Gootman, 2002).

Using physical activity as the core of a PYD model has tremendous potential because of its multifarious benefits. Physical activity helps combat overweight and obesity (Johnston, Delva, & O'Malley, 2007) and can decrease the risk of cardiovascular and metabolic disease, anxiety, and depression (see Physical Activity Guidelines Advisory Committee, 2008; Stensel, Gorely, & Biddle, 2008). Moreover, sport-based settings in particular foster physical activity and contribute to social and psychological well being (Eccles, 2005). Physical activity is also positively related to academic achievement (e.g., Coe, Pivarnik, Womack, Reeves, & Malina, 2006; Keays & Allison, 1995) and psychological outcomes such as physical self-worth and global self-esteem in young people (Crocker, Kowalski, & Hadd, 2008).

Physical activities are involved, interactive, and emotional and provide prosocial opportunities for conflict resolution, cooperation, team building, goal setting, and leadership (Fraser-Thomas et al., 2005; Hellison, Martinek, & Walsh, 2008). Therefore, sport and physical activity contexts can be a vehicle for transmitting valuable life skills and assets such as cooperation, social skills, positive self-perceptions, and peer relationships (see Fraser-Thomas et al., 2005). However, the positive potential is not realized without intentional action to specifically foster desired skills (Danish et al., 2004). Participation in organized sport is often associated with lower moral reasoning, endorsement of aggressive behaviors, and delinquency; yet well designed, theoretically grounded sport and physical activity programs can enhance positive developmental outcomes (Coatsworth & Conroy, 2009; Gano-Overway et al., 2009; Gardner, Roth, & Brooks-Gunn, 2009; Weiss, Smith, & Stuntz, 2008).

Understanding the social context is crucial to realizing positive outcomes from sport and physical activity (Weiss et al., 2008). How the context is structured, a task largely undertaken by adults, shapes the quality of the experience and its consequences (Coatsworth & Conroy, 2009). If the social context fosters competition over cooperation and reinforces aggression and cheating, then suboptimal outcomes are likely. But, for example, if adults use appropriate praise and support, foster a sense of belonging, and create a caring and warm environment for youth, they can promote a variety of positive effects (Coatsworth & Conroy, 2009; Gano-Overway et al., 2009). Recent research on youth sport and physical activity environments suggests there should be more attention focused on understanding the quality of experience over

participation itself (e.g., Coatsworth & Conroy, 2009; Cox, Smith, & Williams, 2008; Gardner et al., 2009). Better understanding the processes by which youth obtain benefits could have an impact on the implementation of future interventions (Benson et al., 2006; Danish et al., 2004).

Interactions with the social environment influence development (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 1998). Adolescents thrive when they have mutually beneficial relationships with people and institutions (Benson et al., 2006). Relationships and social connectedness with nonfamily adults and peers should play a central role in developmental contexts, but research on such relationships in PYD settings is scant.

In the current study, we drew on theories that emphasize interpersonal relationships in youth functioning (Sullivan, 1953) and the role of social factors that foster motivational outcomes and well being (e.g., Eccles et al., 1983; Harter, 1978, 1981). Achievement-based theories, such as Harter's (1978, 1981) competence motivation theory, suggest that social factors influence self-perceptions, intrinsic motivation, and well being. The qualities of relationships with a parent or peers is important for validating self-worth (Sullivan, 1953). Perceived social regard, modeling, approval, and reinforcement behaviors from significant adults and peers are consistent predictors of global and physical self-worth, positive emotions, and motivational orientations in physical activity contexts (see Weiss & Amorose, 2008). More generally, actions and appraisals of significant others can provide a sense of support that fosters optimism and hope (Aspinwall & Leaf, 2002). Overall, there is a solid theoretical foundation indicating that social relationships and connections play a vital role in youth development and may be important mechanisms for PYD program effects.

There is considerable empirical support for the role of social relationships and connections in predicting developmental and achievement outcomes (e.g., Bond et al., 2007; Gano-Overway et al., 2009). In general, positive adult-youth relationships are associated with success in PYD programs (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004). Adult leaders have been shown to affect youth directly through the adult-youth bond and indirectly by establishing a supportive and caring program climate (Gano-Overway et al., 2009; Rhodes, 2004). Peer relationships have been examined less extensively, and findings suggest a complex relationship between peers and developmental outcomes. For example, Gardner and colleagues (2009) found peer-related processes (i.e., deviant affiliations, unstructured socializing) explained part of the positive relationship between sports participation and nonviolent delinquency in an urban youth sample. In contrast, a study of a National Youth Sports Program (NYSP) site was more encouraging about the developmental role of peers. Watson, Newton, and Kim (2003) found that participants who reported higher caring for others

enjoyed camp more, were more interested in sport, were more likely to expect to return to camp the next summer, and had more respect for leaders. However, prior work has not examined how peer relationship constructs, such as social competence, predict psychological outcomes in an NYSP context.

The purpose of this study was to examine if change in perceived social connection within a physical activity-based PYD program would associate with change in psychological outcomes. We hypothesized that (a) social connection and psychological outcome variables would increase over the summer program; and (b) changes in perceptions of social connection would positively predict changes in psychological outcomes.

Method

Participants

Participants involved in a 4-week physical activity-based PYD summer camp hosted at a midwestern U.S. university provided data as part of the program evaluation. All campers ($N = 271$) were invited to participate in the study, and 251 were present during data collection times. Of these, several were not included in analyses because: (a) 1 had difficulty reading and speaking English, (b) 47 completed only the first questionnaire, and (c) 6 completed only the second questionnaire. Therefore, we used data only from those providing responses at Times 1 and 2 ($N = 197$; 102 girls, 95 boys) in main analyses. Preliminary analyses comparing individuals who were and were not included in the analysis did not reveal statistically significant differences on any variables in the dataset. Participants ranged in age from 9 to 16 years ($M = 11.8$ years, $SD = 1.6$) and represented diverse ethnic backgrounds (44% Hispanic, 31% White, 21% African American, 3% American Indian, and 2% Asian). Participants in the NYSP must qualify for the free or reduced lunch program and, therefore, are of low SES. Eighty-seven (44%) were participating in the NYSP for the first time, and 53 (27%), 29 (15%), 18 (9%), 4 (2%), and 6 (3%) were in their second through sixth year of camp, respectively. At the beginning of camp, participants had an average body mass index of 22.97 kg/m^2 , with 24% classified as overweight (≥ 85 th but < 95 th percentile) and another 35% classified as obese (≥ 95 th percentile) based on current CDC guidelines (Ogden & Flegal, 2010).

PYD Program

The NYSP originated in 1968 to provide sport and fitness instruction to low-income youth and was discontinued in 2006. Many local NYSP sites continued to operate under their own auspices, but there is a dearth of empirical evidence on NYSP effects. The program brought low-

income youth (students ages 10–16 years who qualified for free or reduced lunch) to a university to interact with college students and staff in a summer day camp at no cost. Participants in the current study were recruited from one of these sites that evolved into a more comprehensive PYD program designed to address personal and social assets and environmental barriers to healthy living. Participants at this site had access to a wider range of activities than those in a federally prescribed NYSP, including sports and other physical activities (e.g., swimming, fitness, and recreational games), computers and writing, health education, and a service-learning opportunity. Participants attended the program 8 a.m.–2 p.m. Monday through Friday for 4 consecutive weeks. The program provided breakfast, lunch, and a snack at the end of each day. The core program time involved four physical activity stations and a classroom-type station that included computers/writing for 2 weeks and health education for 2 weeks. There were walking bouts between each station. Over 70% of total program time was devoted to physical activity.

The philosophy guiding this particular program was to promote hope and possibility while fostering healthy, active living. Although the program encompassed more than physical activity sessions, physical activity was the focal platform to engage participants and develop life skills for academic, social, and physical domains. Participants in the county surrounding the host university who qualified for free or reduced lunch were invited to participate in the camp program. There was no program cost to participants; they were provided with all equipment to reduce economic barriers to participation (e.g., given swimsuits) and promote group unity (e.g., program t-shirts).

The program staff placed participants in age-specific “teams” of approximately 10–12 individuals. Each team was assigned an adult leader who remained with the group at all times. This structure helped leaders foster relationships with and among the children in their teams. Leaders were carefully selected, largely from the university student body, for their enthusiasm for the program goals. Additionally, they were selected to represent ethnic, gender, and socioeconomic diversity similar to the participants. Team leaders and other program staff received brief training on the program goals, including tips on ways to foster self-esteem among participants. They were also introduced to core program concepts of caring, respect, responsibility, trustworthiness, citizenship, and fairness. These concepts were used to develop and maintain social connection providing a supportive atmosphere for participants to develop positive relationships with an adult figure and peers. For example, as each team walked from activity stations, leaders played ice breaker games with them to increase interaction and closeness. Therefore, we chose to measure perceptions of group leader support and social competence to capture adult and peer relationship perceptions.

Groups rotated through program activities led by specialist instructors (e.g., preservice physical education students and student athletes in a respective sport). The sport stations focused on instruction and skill improvement. Instructors made lesson plans for each day under the guidance of a physical education pedagogy professor who served on the camp administrative staff. The program de-emphasized competition by promoting personal improvement and lifestyle activities (walking, swimming, recreational games). This structure aimed to foster positive perceptions of physical activity and healthy lifestyles, as well as perceptions of personal agency and hope. Therefore, we chose to measure attraction to physical activity as well as perceptions of physical competence, physical and global self-worth, and hope.

Measures

Leader Support. To measure perceived support from one's team leader at the NYSP, we used the teacher support subscale that Cox and Williams (2008) adapted from Goodenow's (1993) Psychological Sense of School Membership Scale perceptions. Cox and Williams modified the scale for physical education, and we further adapted the items to assess participants' perceived support by NYSP team leaders. An example item was, "I can talk to my NYSP team leader if I have a problem." The subscale consisted of six items measured on a 5-point response set, ranging from 1 = not at all true of me to 5 = very true of me. Subscale item scores were averaged, with higher scores representing greater perceptions of leader support. Evidence for score reliability and validity on the original and adapted measures has been provided in education, sport, and physical education settings (Allen, 2006; Cox & Williams, 2008; Goodenow, 1993). Internal consistency reliability was marginal at Time 1 ($\alpha = .60$) and good at Time 2 ($\alpha = .76$). Deleting items did not substantially improve the Time 1 internal consistency value.

Social Competence. We administered the social competence subscale from Harter's (1985) Self-Perception Profile for Children, which contains six items accompanied by a 4-point structured-alternative response set. An example item, contextualized to the NYSP context, was, "Some kids find it hard to make friends at NYSP, BUT other kids find it's pretty easy to make friends at NYSP." Participants were asked to choose one of two statements that was more self-descriptive and then indicate whether that statement was *really true* or *sort of true* (receiving a score of 1–4). Scores on the subscale items were averaged, and higher values represented more positive self-perceptions. Support for score reliability and validity on this measure has been demonstrated (Harter, 1985). Internal consistency values in the present study were good (Time 1 $\alpha = .70$; Time 2 $\alpha = .74$).

Physical Competence and Global Self-Worth. We administered the physical competence and global self-worth

subscales from Harter's (1985) Self-Perception Profile for Children. The format was the same as for the social competence measure. An example item from the physical competence scale, which was contextualized to reference general physical activities as well as sport, was, "Some kids wish they could be a lot better at sports and physical activities, BUT other kids feel they are good enough at sports and physical activities." An example of a global self-worth item is, "Some kids are often unhappy with themselves, BUT other kids are pretty pleased with themselves." Scores on the subscale items were averaged, and higher values represented more positive self-perceptions. Support for score reliability and validity on these subscales has been demonstrated (Harter, 1985). Internal consistency values for physical competence scores was marginal at Time 1 ($\alpha = .68$) and Time 2 ($\alpha = .74$). Deleting items did not result in substantial improvement of the Time 1 value. Internal consistency values for global self-worth scores were good at Time 1 ($\alpha = .75$) and Time 2 ($\alpha = .80$).

Physical Self-Worth. We used the physical self-worth subscale of Whitehead's (1995) Children's Physical Self-Perception Profile to assess participants' global perceptions of satisfaction and confidence with the physical self. The measure is a child-appropriate adaptation of an adult measure developed by Fox and Corbin (1989). The subscale contains six items rated on a 4-point structured-alternative response set identical to the social competence measure. An example item is, "Some kids don't feel very confident about themselves physically, BUT other kids feel really good about themselves physically." The subscale item scores were averaged, and higher values reflected greater perceptions of physical self-worth. Support for score reliability and validity on this scale has been demonstrated in prior research with seventh- and eighth-grade students (Whitehead, 1995). Internal consistency values were good at Time 1 ($\alpha = .80$) and Time 2 ($\alpha = .85$).

Attraction to Physical Activity. We used a 15-item version of Brustad's (1993) Children's Attraction to Physical Activity (CAPA) scale that was used by Paxton, Estabrooks, and Dziewaltowski (2004) to assess participants' broad attraction to physical activity. Each item was rated on a 4-point structured-alternative response set identical to the social competence measure. An example item is, "Some kids look forward to playing games and sports, BUT other kids *don't* look forward to playing games and sports." Item scores were averaged, and higher values indicated greater attraction to physical activity. Brustad provided support for score reliability and validity on the original CAPA, and Paxton et al. offered psychometric support for the 15-item version. Internal consistency reliability values in the present study were good at Time 1 ($\alpha = .87$) and Time 2 ($\alpha = .89$).

Hope. The Children's Hope Scale (Snyder et al., 1997) contains six items assessing belief in the ability to find routes to goals and to initiate and sustain efforts to achieve

goals. Each item was assessed on a 6-point response set ranging from 1 = none of the time to 6 = all of the time. Scores on these items were averaged, and higher values indicated greater hope. An example item was, "When I have a problem, I can come up with lots of ways to solve it." This measure was developed for use with children ages 8–16 years, and support for score reliability and validity was demonstrated by Snyder et al. (1997). Internal consistency values were good at Time 1 ($\alpha = .84$) and Time 2 ($\alpha = .87$).

Procedures

This project received exempt status from the institutional review board of the host university, because data collection constituted part of the program activities and was conducted for program evaluation purposes. Questionnaires were administered at one of the camp stations on the second day (Time 1) and the third-to-last day (Time 2) of the 4-week program. Participants completed the questionnaires in approximately 15–30 min. Campers who were absent were able to complete the questionnaire the following day. Prior to data collection, a researcher explained the purpose of the questionnaire and communicated that participation was voluntary. Trained research assistants were available to answer questions and read items aloud to campers with reading difficulties.

Data Analysis

We screened data for missing values and distribution properties and calculated internal consistency reliability, mean, standard deviation, and bivariate correlation values. To test the hypothesis that camp participation would associate with an increase in social connection variables (social competence, leader support) and psychological outcome variables (global self-worth, physical self-worth, attraction to physical activity, and hope), we used a repeated-measures multivariate analysis of variance (MANOVA) with follow-up repeated-measures analyses of variance to assess change over time in these variables. To test the hypothesis that changes in perceptions of social connection would positively predict changes in psychological outcomes, residual change scores (see Schutz, 1989) were calculated for each variable and used in hierarchical multiple regression analyses. In these analyses, we controlled for physical competence perceptions given prior evidence that physical competence has a moderate to strong association with social acceptance and all the psychological outcome variables (Fox & Corbin, 1989; Harter, 1985; Paxton et al., 2004; Snyder et al., 1997; Weiss & Duncan, 1992).

Results

Only 19 item responses (0.07% of data) were missing from the data set. Person mean substitution was used to

impute missing data (Downey & King, 1998; Hawthorne & Elliott, 2005). All variables were approximately univariate normally distributed, and no outliers were identified. All variables had moderate to high mean scores relative to their response scales (see Table 1). Table 2 contains correlations among variables at Times 1 and 2, respectively, as well as intraclass correlations (ICC) between Times 1 and 2. All variables were positively correlated ($p < .01$) at both time points. Variables showed moderate stability across the two time points (ICC = .59–.75).

The repeated measures MANOVA conducted to examine change from pre- to postprogram yielded a significant multivariate time effect, Wilks' $\Lambda = .83$, $F(7, 190) = 5.43$, $p < .01$, $\eta^2 = .17$. Follow-up univariate analyses showed that perceived social competence, physical competence, physical self-worth, and global self-worth increased ($p < .01$) from pre- to postprogram (see Table 1). There were no significant changes in the remaining variables.

Repeated-measures MANOVA, including potential moderators (i.e., age, gender, body mass index, and program experience) of the time effect, yielded no significant Group \times Time interaction effects, except for age (younger = 9–11 years; older = 12–16 years), Wilks' $\Lambda = .93$, $F(7, 189) = 2.20$, $p < .05$, $\eta^2 = .08$. Specifically, perceived leader support decreased for the younger group but did not change for the older group ($p < .05$, $\eta^2 = .02$), and physical self-worth ($p < .05$, $\eta^2 = .03$) and attraction to physical activity ($p < .05$, $\eta^2 = .03$) increased for the older group but did not change for the younger group ($p < .05$). For descriptive purposes, we also examined time effects for the following subgroups: girls, Wilks' $\Lambda = .76$, $F(7, 95) = 4.19$, $p < .01$, $\eta^2 = .24$; boys, Wilks' $\Lambda = .84$, $F(7, 88) = 2.33$, $p < .05$, $\eta^2 = .16$; healthy weight status, Wilks' $\Lambda = .76$, $F(7, 71) = 3.19$, $p < .01$, $\eta^2 = .24$; overweight/obese, Wilks' $\Lambda = .82$, $F(7, 112) = 3.48$, $p < .01$, $\eta^2 = .18$; returners to the program, Wilks' $\Lambda = .84$, $F(7, 103) = 2.78$, $p < .05$, $\eta^2 = .16$; newcomers to the program, Wilks' $\Lambda = .67$, $F(7, 80) = 5.58$, $p < .01$, $\eta^2 = .33$; younger (ages 9–11 years) participants, Wilks' $\Lambda = .72$, $F(7, 81) = 4.44$, $p < .01$, $\eta^2 = .28$; and older (ages 12–16 years) participants, Wilks' $\Lambda = .83$, $F(7, 102) = 2.99$, $p < .01$, $\eta^2 = .17$. Overall, we observed similar trends across subgroups, with some variation in effect size (see Table 1). Notable differences were that boys did not significantly increase in social competence, those new to the program and younger did not significantly increase in physical self-worth, and attraction to physical activity increased for older participants.

We conducted separate hierarchical multiple regression analyses to examine whether change in social connection variables predicted change in physical self-worth, global self-worth, attraction to physical activity, and hope, respectively, while controlling for change in perceived physical competence (see Table 3). Greater change in perceived physical competence ($p < .01$) predicted greater change in all outcome variables in Step 1. Change in social connection variables did not add to variance explained in

Table 1. Means, standard deviations, and time effects for whole sample ($N = 197$) and subgroups

Variable Subgroup	Scale range	Time 1		Time 2		Time effect	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i>	Partial η^2
Social competence	1-4	2.96	.65	3.12	.64	15.67**	.07
Girls ($n = 102$)		3.01	.67	3.21	.59	12.78**	.11
Boys ($n = 95$)		2.91	.63	3.02	.68	3.79	.04
Healthy weight ($n = 78$)		2.93	.64	3.03	.65	15.11**	.16
Overweight/obese ($n = 119$)		3.01	.66	3.24	.61	4.34*	.04
Returner ($n = 110$)		3.01	.65	3.15	.65	6.00*	.05
New ($n = 87$)		2.90	.65	3.08	.63	10.95**	.11
Older ($n = 109$)		3.08	.61	3.22	.64	6.95*	.06
Younger ($n = 88$)		2.82	.67	3.00	.63	8.81**	.09
Leader support	1-5	4.24	.67	4.23	.79	.01	.00
Girls ($n = 102$)		4.30	.57	4.36	.71	.95	.00
Boys ($n = 95$)		4.17	.76	4.09	.85	1.95	.02
Healthy weight ($n = 78$)		4.20	.63	4.19	.77	.01	.00
Overweight/obese ($n = 119$)		4.29	.72	4.29	.81	.03	.00
Returner ($n = 110$)		4.30	.60	4.31	.75	.02	.00
New ($n = 87$)		4.15	.73	4.13	.83	.10	.00
Older ($n = 109$)		4.25	.67	4.34	.77	2.10	.02
Younger ($n = 88$)		4.21	.67	4.10	.80	2.64*	.03
Physical competence	1-4	2.90	.61	3.06	.61	18.41**	.09
Girls ($n = 102$)		2.88	.61	3.03	.61	7.39**	.07
Boys ($n = 95$)		2.92	.62	3.10	.61	11.69**	.11
Healthy weight ($n = 78$)		2.80	.59	2.98	.60	6.79*	.08
Overweight/obese ($n = 119$)		3.05	.62	3.19	.60	11.64**	.09
Returner ($n = 110$)		2.98	.63	3.12	.62	7.49**	.06
New ($n = 87$)		2.80	.58	2.99	.59	11.53**	.12
Older ($n = 109$)		2.90	.66	3.10	.62	13.75**	.11
Younger ($n = 88$)		2.89	.56	3.02	.59	5.06*	.06
Physical self-worth	1-4	3.08	.67	3.22	.67	11.12**	.05
Girls ($n = 102$)		3.08	.64	3.22	.69	6.28*	.06
Boys ($n = 95$)		3.09	.70	3.22	.66	4.89*	.05
Healthy weight ($n = 78$)		2.94	.67	3.08	.69	5.67*	.07
Overweight/obese ($n = 119$)		3.30	.60	3.43	.59	5.98*	.05
Returner ($n = 110$)		3.09	.67	3.26	.68	10.23**	.09
New ($n = 87$)		3.07	.67	3.17	.67	2.23	.03
Older ($n = 109$)		3.06	.72	3.27	.67	17.26**	.14
Younger ($n = 88$)		3.12	.60	3.15	.68	.28	.00
Global self-worth	1-4	3.12	.65	3.30	.61	17.12**	.15
Girls ($n = 102$)		3.12	.66	3.33	.61	6.28*	.06
Boys ($n = 95$)		3.13	.65	3.26	.61	6.20*	.06
Healthy weight ($n = 78$)		3.03	.66	3.20	.62	10.57**	.12
Overweight/obese ($n = 119$)		3.27	.62	3.43	.57	12.13**	.09
Returner ($n = 110$)		3.19	.66	3.33	.57	8.52**	.07
New ($n = 87$)		3.03	.64	3.25	.66	14.50**	.14
Older ($n = 109$)		3.14	.67	3.33	.59	13.63**	.11
Younger ($n = 88$)		3.11	.63	3.25	.64	8.58**	.09
Attraction to physical activity	1-4	3.05	.58	3.10	.58	1.89	.01
Girls ($n = 102$)		3.05	.54	3.11	.57	2.22	.02
Boys ($n = 95$)		3.06	.60	3.08	.60	.20	.00
Healthy weight ($n = 78$)		2.96	.52	2.98	.55	2.72	.03
Overweight/obese ($n = 119$)		3.20	.61	3.28	.59	.23	.00
Returner ($n = 110$)		3.11	.61	3.16	.59	1.55	.01
New ($n = 87$)		2.98	.50	3.01	.56	.49	.01
Older ($n = 109$)		3.03	.60	3.14	.58	7.46**	.07
Younger ($n = 88$)		3.08	.52	3.04	.59	1.04	.01
Hope	1-6	4.49	.99	4.54	1.02	.74	.00
Girls ($n = 102$)		4.60	.87	4.69	.90	1.77	.02
Boys ($n = 95$)		4.38	1.11	4.37	1.11	.00	.00
Healthy weight ($n = 78$)		4.38	.96	4.38	1.06	1.97	.03
Overweight/obese ($n = 119$)		4.66	1.02	4.78	.91	.00	.00
Returner ($n = 110$)		4.63	.95	4.60	1.00	.18	.00
New ($n = 87$)		4.31	1.02	4.45	1.03	3.28	.04
Older ($n = 109$)		4.55	1.05	4.66	1.03	1.97	.02
Younger ($n = 88$)		4.42	.91	4.39	1.00	.16	.00

Note. *M* = mean; *SD* = standard deviation; bold line = results for whole sample; *F* comes from a follow-up analysis of variance from repeated-measures multivariate analysis of variance.

* $p < .05$; ** $p < .01$.

change in physical self-worth; however, change in social connection variables explained additional variance to global self-worth ($\Delta R^2 = .05, p < .01$), attraction to physical activity ($\Delta R^2 = .07, p < .01$), and hope ($\Delta R^2 = .04, p < .01$). Increases in social competence and leader support ($p < .05$) predicted increases in global self-worth and attraction to physical activity. Increases in social competence ($p < .05$) predicted increases in hope. Separate analyses showed that demographic variables (i.e., age, gender, body mass index, program experience) neither served as covariates nor moderated analysis outcomes. Nearly identical results emerged in regression analyses using the Time 2 outcome variable as the dependent variable, entering the Time 1 outcome variable as a predictor on the first step of the regression analysis.

Discussion

We assessed a physical activity-based PYD program for low-income youth that was designed to address physi-

cal activity barriers and build personal and social assets. This study specifically targeted how change in perceived social connection constructs was associated with change in psychological outcomes. Based on motivational and developmental theories, we expected the social connection (social competence, leader support) and psychological outcome variables (physical self-worth, global self-worth, attraction to physical activity, and hope) would improve over the course of the camp and that positive changes in perceptions of social connection would predict positive changes in psychological outcomes.

The average changes in the study variables were modest but positive. The only moderator we tested that showed significant difference in change was for older participants compared to younger ones, although the differences were of very low magnitude. Significant increases from pre- to postprogram for perceived social and physical competence, physical self-worth, and global self-worth partially supported the first hypothesis. As a physical activity-based program, we expected physical competence would play

Table 2. Correlations at Times 1 and 2 ($N = 197$)

Variable	1	2	3	4	5	6	7
1 Social competence	.59	.34	.43	.44	.39	.49	.39
2 Leader support	.37	.60	.26	.24	.32	.37	.43
3 Physical competence	.62	.30	.62	.62	.48	.68	.39
4 Physical self-worth	.58	.25	.72	.64	.66	.64	.45
5 Self-worth	.52	.38	.62	.72	.68	.53	.38
6 Attraction to physical activity	.64	.36	.73	.73	.64	.75	.47
7 Hope	.45	.53	.44	.46	.44	.49	.70

Notes. Correlations among Time 1 variables appear above the bold face type; correlations among Time 2 variables appear below the bold face type; the intraclass correlations between Times 1 and 2 are in bold face type; all correlations are significant at $p < .01$.

Table 3. Hierarchical multiple regression analyses with residual change in physical competence and social connection variables predicting residual change in psychological outcomes ($N = 197$)

Outcome variable Step (df)	F	R^2	ΔR^2	PC	β SC	LSP
Physical self-worth						
Step 1 (1, 195)	84.20**	.30	—	.55**		
Step 2 (3, 193)	28.29**	.31	.01	.52**	.07	-.01
Global self-worth						
Step 1 (1, 195)	59.39**	.23	—	.48**		
Step 2 (3, 193)	25.27**	.29	.05**	.37**	.16*	.15*
Attraction to physical activity						
Step 1 (1, 195)	64.62**	.25	—	.50**		
Step 2 (3, 193)	29.40**	.31	.07**	.38**	.17*	.19**
Hope						
Step 1 (1, 195)	10.69**	.05	—	.23**		
Step 2 (3, 193)	6.32**	.09	.04*	.13	.16*	.11

Note. PC = perceived physical competence; SC = perceived social competence; LSP = leader support.
* $p < .05$; ** $p < .01$.

a salient role in predicting outcomes in this NYSP. Our findings are consistent with previous theory and research, suggesting programs that emphasize personal improvement over competition, a climate focused on individual success, and autonomy support are well suited to fostering positive outcomes, at least in part by affecting perceived competence (Coatsworth & Conroy, 2009; Conroy, Elliot, & Coatsworth, 2007).

Social connection perceptions were related to psychological outcomes. At both time points, there were positive correlations of moderate magnitude between social connection perceptions and psychological outcomes. Regression analyses revealed that changes in social connection predicted changes in psychological outcomes, except for physical self-worth, largely supporting the second hypothesis. Specifically, increased social competence and leader support perceptions predicted increased global self-worth and attraction to physical activity, and increased perceptions of social competence predicted increased hope. The physical self-worth findings suggest that in controlling for perceived competence, which is closely linked with social competence, there is no additional predictive value of social competence in the present physical activity setting. The theoretical underpinnings of this study suggest that feelings of social connectedness play a vital role in youth well being and achievement motivation (e.g., Eccles et al., 1983; Harter, 1978, 1981; Sullivan, 1953). Our findings support this association, albeit modestly because of the observed effect sizes and a noncausal research design. The findings support the contention that youths' interactions with adults and peers in their social context play an important role in development, which is a core feature of ecological theory (Bronfenbrenner & Morris, 1998).

From a practical standpoint, it is important to carefully consider the social context when planning and designing PYD programs. While the low reliability of the leader support measure at Time 1 may have attenuated associations, the findings linking changes in leader support with changes in self-worth and attraction to physical activity are consistent with previous work highlighting the importance of a caring adult in fostering positive developmental outcomes (Benson et al., 2006; Catalano et al., 2004). The relatively high perceptions of leader support at Time 1, however, may have left little room for change, making it more difficult to address how change in support predicts change in developmental outcomes, particularly in predicting hope, which also had little variability over time. Leader support did associate with psychological outcomes in bivariate correlations, suggesting it is a relevant construct to these outcomes and, with improved measurement properties, may result in increased ability to capture how *changes* in each are linked. The association of change in perceived social competence with change in global self-worth, attraction to physical activity, and hope is consistent with the purported salience of this

construct in physical activity (see Smith, 2003; Smith & McDonough, 2008; Weiss & Stuntz, 2004) and various other developmental contexts (see Rubin, Bukowski, & Parker, 2006). The program's structure and content may be vital to the type of effect garnered through a positive social connection. In particular, findings from the present study suggest that fostering connectedness to *both* adults and peers is important and could be accomplished by designing programs that endorse and reward caring and respect for others (Gano-Overway et al., 2009).

Practical implications of the current study also include encouraging physical activity-based programs that emphasize cooperation and personal growth. Education-based research has shown that cooperative learning environments enhance learning and interpersonal relationships when they emphasize interdependent goals, face-to-face interaction, individual accountability, communication and social skills, and group evaluation (Hymel, Zink, & Ditner, 1993; Johnson & Johnson, 1990). Using a physical activity context for PYD is particularly attractive given the unique nature of sport and physical activity contexts to promote physical, psychological, social, and emotional growth (Fraser-Thomas et al., 2005). As low-income youth experience disparate health outcomes from other youth (see Goodman et al., 2003; Kroenke, 2008), it seems particularly beneficial to use physical activity-based programs with this population. The present findings are encouraging in that increases in perceptions of physical competence and physical self-worth were obtained within a relatively short time frame. Researchers can build on the present work by monitoring changes in body composition and fitness that may accompany these positive trends in physical self-perceptions. Also, successful models for physical activity-based programs exist (see Fraser-Thomas et al., 2005; Petitpas, Cornelius, Van Raalte, & Jones, 2005), and there is a need to more rigorously assess programs that provide comprehensive developmental opportunities to build physical, intellectual, psychological/emotional, and social assets (Eccles & Gootman, 2002). It should be noted that the present PYD program included a variety of activities, and attributing effects solely to physical activity may be premature. Although the more comprehensive approach to program design ostensibly allows for a breadth of opportunities to foster developmental assets, future research is warranted to address this assumption and the way specific program content may affect PYD outcomes.

Important limitations of the present study should be considered. The lack of a control group prevents attributing changes to camp participation. Future work including a control group and systematic manipulation of the implementation of particular PYD features is needed to establish specific mechanisms of change. The results of this study lend credence to intentionally fostering positive social connectedness among program participants. However, the least explored component of PYD theory is

how to conceptualize and practice the fusion of individual and ecological strengths to promote positive change (Benson et al., 2006). Implementing experimental designs to intentionally alter the social environment and assess the effects would assist in filling this knowledge gap. Program participants were also self- or parent-selected. Thus, caution must be taken in generalizing the present findings beyond low SES participants who seek involvement in such programs.

The modest effect sizes in this study also warrant discussion. The program was administered over a relatively short time period, limiting the amount of social and psychological change that could be expected. Future research is warranted to address how program length and other factors may affect the strength, generalizability, and retention of PYD outcomes (Benson et al., 2006). However, the effect sizes are commensurate with existing PYD research findings grounded in ecological and developmental systems theories (Benson et al., 2006). Thus, the changes we observed over the relatively short period of the present program are encouraging and suggest that even brief interventions may be effective in the short term. Research using proper controls and including assessments that extend beyond the length of the focal PYD program will be necessary to address the potential long-term impact of such interventions. It is possible, for example, that observed changes are confined to the program's time frame. Alternatively, there may be a longer term benefit expressed in sustained change after one program exposure or a rapid return to postprogram gains on re-exposure. Research designs that support more sophisticated longitudinal analyses with three or more time points would greatly enhance understanding of patterns and maintenance of change.

Last, we did not consider the relative importance of the key features of positive development (Eccles & Gootman, 2002) in the current study. For example, how does the impact of supportive relationships compare to opportunities for skill building in stimulating positive developmental outcomes? There are clearly multiple gateways to positive development, and the relative, additive, or interactive contributions of these features will be useful information for PYD program planning and prioritization. Careful design, implementation, and assessment of youth programs are all important in providing increased life opportunities to disadvantaged youth.

This study was designed to offer insight into how social relationships may promote positive developmental opportunities to low-income youth. Our findings suggest that social relationships warrant special attention when seeking to foster positive psychological outcomes in this population. Moreover, they suggest that perceptions of social connection can be meaningfully enhanced within a relatively short time in physical activity-based programs. Such programs appear to have much potential for promot-

ing physical, psychological, social, and emotional growth and warrant close attention in the PYD literature.

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