Enhancing the self-esteem of youth swimmers through coach training: Gender and age effects

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Abstract

Objectives: Prior research has indicated that improving the behavior of youth sport coaches can enhance the self-esteem of boys age 12–14, particularly for those who begin the season with low self-esteem [Smoll, F. L., Smith, R. E., Barnett, N. P., & Everett, J. J. (1993). Enhancement of children’s self-esteem through social support training for youth sport coaches. \textit{Journal of Applied Psychology}, 78, 602–610]. The purpose of the present study was to extend the literature by testing the efficacy of a psychosocial coach training intervention for enhancing the self-esteem of male and female swimmers aged 7–18 years.

Methods: Youth (N=135) and coaches (N=7) participated in a randomized efficacy trial comparing the effects of a psychosocial coach training intervention to an injury prevention intervention on changes in youth self-esteem over the course of a 7-week swim season. Three waves of data were collected: beginning-of-season (pre-intervention), mid-season, and end-of-season.

Results: Longitudinal growth modeling indicated significant variability in initial levels of self-esteem at beginning-of-season, but no significant mean level changes over time. Effects of the experimental intervention were moderated by age, initial level of self-esteem, and gender. Effects of psychosocial coach training were strongest for younger participants, and for girls who started the season with low levels of self-esteem.

Conclusions: Training coaches in psychosocial and behavioral principles is an effective way to alter coach behavior and enhance the athlete-coach relational context. Psychosocial coach training is also associated with gains in self-esteem for some, but not all, athletes and may be most important for youth who need it most. Implications for coach training programs are discussed.

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Keywords: Youth sport; Youth development; Coach-training; Program evaluation
One of the most commonly held beliefs about the benefits of youth sports is that it will build self-esteem. For many years however, the scientific literature was limited to theoretical discussion of why a better sense of self (increased perceived competence, heightened self-esteem, raised self-confidence) was, or was not, a primary benefit of sports participation and why this was an important area for future studies. Recently, some meta-analytic studies and studies using large, nationally-representative samples from the United States have provided empirical support for the hypothesized connection between sports and self-esteem (Marsh, 1993a; Marsh & Kleitman, 2003; Tracy & Erkut, 2002), but others have not (Fisher, Juszczak, & Friedman, 1996).

The non-experimental nature of most studies and the variability in findings across studies make it difficult to conclude with confidence that sports participation increases self-esteem. In addition, some evidence suggests that the effects of sport on youth depend strongly on contextual factors such as the relations one forms with important adults and peers within the context (Brustad, Babkes, & Smith, 2001; Smith, 1999) or the quality and organization of the broad youth sports program in which one participates (Whitehead & Corbin, 1997). Clearly, more experimental studies would aid in understanding this relationship, but given the volunteer nature of youth sports, random assignment of subjects to participation or non-participation is not a feasible aspect of a research design.

Instead, investigators interested in this relationship have focused on experimentally altering those contextual factors of youth sport that are most likely to influence self-esteem. Modifying coach behavior is one promising avenue for experimentally manipulating the relational context within the sport environment to test the relationship between participation and increases in self-esteem (Smith & Smoll, 1990; Smoll, Smith, Barnett, & Everett, 1993). Few experimental studies have been conducted, however, and the conclusions that can be drawn from existing studies are limited due to samples that include only males, lack of fully randomized designs with data at multiple time points, and analyses focused on average group change instead of intra-individual growth trajectories.

The purpose of this study was to investigate the effects of a psychosocially based coach-training program on the self-esteem of children and youth in a summer swim league. The study was designed to advance the literature by randomly assigning coaches to training programs, collecting data at three time points over the course of the season, including female and male participants, and employing state-of-the-science techniques for modeling developmental change.¹

Self-esteem

Self-esteem is one of the most popular constructs in the scientific and lay psychological literature, despite its widely varying definitions and ways of measuring it. Generally, it refers to a person’s global evaluation of his or her overall worthiness (Coopersmith, 1967; Rosenberg, 1979), and reflects feelings about one’s skills, abilities, and social relationships. Self-esteem is often used as an indicator of an individual’s well being, such that individuals with high self-esteem are presumed to be more psychologically healthy (Taylor & Brown, 1988), and those with low self-esteem are believed to be distressed (Tennen & Affleck, 1993). Although the correlates and effects of self-esteem are far from

¹ The literature reviewed for the present study was conducted in the United States unless otherwise noted. Although cross-cultural issues with respect to self-esteem, coaching and sport participation are interesting topics for research, they are beyond the scope of the current study.
crystal clear (Baumeister, Campbell, Krueger, & Vohs, 2003; Dubois & Tevendale, 1999), developmental researchers generally believe that self-esteem influences both concurrent and future affect and behavior (Harter, 1999).

Self-esteem, conceptualized as a developmental outcome, is a reflection of both intrapersonal and interpersonal processes. It is a function of private self-evaluations of one’s competence and abilities (Harter, 1999) and the internalization of the affects and beliefs expressed in interpersonal interactions with significant others (Cooley, 1902; Mead, 1934; Rosenberg, 1965). Intrapersonal processes include cognitive evaluations of one’s performance in relative developmental spheres (e.g. school performance, athletic performance) in comparison to internal or external standards (Fox & Corbin, 1989; Harter, 1998, 1999; Heatherton & Polivy, 1991; Marsh, 1993b). Regarding interpersonal processes, Harter (1999) postulated that youth self-esteem is partly a function of the quality of interactions (e.g. supportive and accepting vs. demeaning and rejecting) youth have with important adults in different ‘relational contexts’ (e.g. parent–child relational context, athlete-coach relational context). Each context has unique significance and influence on sense of self. For example, youth who participate in athletics and rate athletics as an important dimension of self-worth may be particularly sensitive to type of feedback provided by the coach within the athlete-coach relational context.

A developmental perspective is critical for studies that examine levels of self-esteem across age and gender. Levels of global self-esteem theoretically represent a baseline that changes only gradually over extended periods of time (Rosenberg, 1986); however, specific age-related changes in self-esteem have been documented in the developmental literature (Harter, 1990, 1999). Prior to age seven, children may not have the cognitive capacities to integrate multiple perceptions of the self into a single, unified view (Harter, 1999). As children move into middle childhood, levels of global self-esteem decline (Harter, 1982; Harter & Pike, 1984). This decline may be related to increased cognitive abilities and to increased capacity for social comparison and evaluation of external feedback. Another decline is associated with the onset of puberty (Simmons & Blyth, 1987). Generally, these age differences in the natural levels of self-esteem suggest that investigations, such as this one, that include youth from a wide age range should use designs and analyses that account for age-related changes.

Likewise, gender differences in global self-esteem have also been documented consistently in the literature (Blyth, Simmons, & Carleton-Ford, 1983; Wigfield, Eccles, MacIver, Reuman, & Midgely, 1991). Beginning in junior high (around age 12–13) and continuing through high school (age 17–18), girls generally show lower scores on measures of self-esteem and self-concept than boys (Harter, 1999). Over this period, and perhaps extending to the early twenties, the gap between boys and girls global self-esteem widens (Block & Robins, 1993). This widening gap in global self-esteem has been attributed primarily to girls’ steady decline in their perceptions of physical appearance (Harter, 1999). Just as age becomes a critical developmental factor when evaluating levels of self-esteem or how it changes over time, gender should receive the same consideration.

**Self-esteem and youth sports**

The common belief that sport builds youth self-esteem has a long history in the literature despite a general lack of empirical evidence (Coakley, 2002). In recent years, several studies have demonstrated empirical links between sports participation and higher levels of self-esteem (Marsh & Kleitman, 2003;
Tracy & Erkut, 2002). Findings also indicate that the relations are not likely to be direct and may be influenced by important contextual factors.

The relation between sport participation and self-esteem may be mediated by changes in other personal competencies, perceptions, and personal relationships and attachments, and it has been suggested that if these other psychosocial benefits are not present, then sports may even undermine self-esteem (Richman & Shaffer, 2000). The quality of the athlete-coach relational context is one potential factor that might moderate or mediate the relations between sport participation and self-esteem. When the athlete-coach relational context is characterized by high levels of support, social acceptance, loyalty, trust, and evaluative feedback that is accurate, contingent and positive, it is likely to foster healthy global self-worth (Harter, 1999; Leary & Baumeister, 2000). In contrast, self-esteem is likely to be undermined when behavior of important adults, such as coaches, includes inconsistent or controlling directives (Greenier, Kernis, & Waschull, 1995). Studies indicate that coaching behaviors can account for a significant percentage of the variance in boys’ self-esteem scores at the end of a basketball season (Smith, Zane, Smoll, & Coppel, 1983) and that boys with low self-esteem are more sensitive and responsive to coaches’ instructive and supportive behaviors (as reflected by increased attraction to the coaches) than are high self-esteem boys (Smith & Smoll, 1990).

Coach training interventions and effects on self-esteem

Several coach-training programs have been designed to improve coach behaviors that, in turn, are believed to influence positive youth development (e.g. American Coach/Sport Education Program [ACEP/ASEP; Martens, 1997], Coach Effectiveness Training [CET; Smith & Smoll, 1996], National Youth Sport Coaches Association program [Brown & Butterfield, 1992], Athletic Coaches Education [Seefeldt, Clark, & Brown, 2001]). Of these, the CET program has been subject to the most extensive empirical evaluation.

CET consists primarily of a 2-h workshop that: (1) advocates a philosophy of winning that emphasizes learning, effort, and improvement over objective, normatively-evaluated success, (2) teaches general principles related to the role of sport in youth development, (3) teaches ways of dealing with common problems in youth sport, and (4) teaches behavioral strategies that coaches can use following good plays, mistakes, and misbehaviors (Smith & Smoll, 1996; Smoll & Smith, 1997). The behavioral strategies taught to coaches and the philosophy that is promoted in CET are intended to create the kind of relational context (e.g. supportive, nurturing, encouraging, structured, non-hostile) that have been linked to increases in self-esteem for youth (Harter, 1999).

Two quasi-experimental trials of the CET program have demonstrated efficacy for altering the athlete-coach relational context and for promoting youth self-esteem. In the first trial, CET coaches used more reinforcement than coaches in the control condition and boys playing for CET-trained coaches demonstrated greater increases in self-esteem from the previous year than did boys playing for control group coaches (Smith, Smoll, & Curtis, 1979). In the second trial, boys who played for CET-trained coaches perceived their coaches as engaging in significantly more desirable behaviors (e.g. reinforcement, encouragement, technical instruction; Smoll et al., 1993). Additionally, low self-esteem boys who played for CET-trained coaches increased in self-esteem more than low self-esteem boys who played for coaches without CET training (Smoll et al., 1993). These two quasi-experimental trials indicate that the CET program can modify coaching behaviors and the athlete-coach relational context in
ways that enhance self-esteem among 10–12 year old boys who begin the season with low self-esteem. The extent to which these findings generalize to older and younger boys or to girls is not known and was a focus of the present study.

**Purpose and hypotheses**

The current study was conducted as part of a larger, ongoing program of coach training research being conducted at Penn State University (see also Conroy & Coatsworth, 2004). The intention of the parent program is to experimentally test the effects of a psychosocial coach-training workshop to change coach behavior to influence a wide range of psychosocial outcomes for youth (e.g. motivation, fear of failure, self-esteem). The current study focused on the outcome of self-esteem and was guided by two aims. The first aim investigated whether youth self-esteem changed during the course of a seven-week swim season. To address this aim we considered three specific sub-questions: (1) do youth vary in their starting values for self-esteem? (2) on average, do self-esteem scores stay the same, increase, or decrease over time? (3) is inter-individual variability present in rates of change in self-esteem over the season? The second, and primary, aim of this study tested the main and moderated effects of the coach-training program on rates of change in self-esteem for children and youth in this sample. Three hypotheses were proposed to address this aim:

1. children and youth who swam for psychosocially-trained coaches would increase their self-esteem at a greater rate than children and youth who swam for control group coaches (main effect);
2. effects of the coach-training intervention would be larger for younger children than for older children because younger children are more likely to rely on feedback from meaningful adult figures (moderated effect), and
3. effects of the coach-training intervention would be most pronounced for youth who started the season with low levels of self-esteem (moderated effect).

In addition, a goal of the study was to extend the literature on coach-training interventions by investigating the effects for girls because all previous research focused on boys. No specific hypothesis was proposed, but analyses were conducted to test whether gender moderated the size of intervention effects.

**Methods**

**Participants**

The present study included 135 youth participants (52 boys and 83 girls) and seven coaches from two teams in a swim league sponsored by the local Department of Parks and Recreation. The control (N=69) and experimental (N=66) groups included approximately equal numbers of boys and girls, $\chi^2(1, N=135)=1.47$, $p>.05$. The mean age of participants was 11.4 years (SD=2.23; range=7–18) and age did not differ across conditions, $t(120)=0.36$, $p>.05$. Consistent with the demographic characteristics of the community, participants were almost exclusively white and middle-class.
Four female coaches from one team received the experimental (i.e. psychosocial) training program whereas three coaches (two female, one male) from the second team received the control-training program. The mean age of coaches at the start of the study was 20.3 years (SD = 1.5) and they had an average of 2.43 seasons (SD = 1.13, range = 1–4) of experience coaching youth swimming.

*Instruments*

Self-esteem was assessed using the Washington Self-Description Questionnaire (WSDQ; Smoll et al., 1993), a 14-item self-report instrument used to measure global self-esteem in CET evaluations. WSDQ items represent global self-evaluations and are written for the average reading ability of second grade students (age 7–8; Flesch–Kincaid index). Six items are worded positively (e.g. “I like being the way I am”) and eight items are worded negatively (“I often feel ashamed of myself”). Participants rated how well each statement characterized them on a four-point scale ranging from *not at all like me* (1) to *very much like me* (4). In previous research, WSDQ scores have exhibited strong positive correlations with optimistic performance expectations (Scanlan & Lethwaite, 1985) and with scores from other self-esteem measures (e.g. General Self-Esteem subscale of the Piers-Harris Children’s Self-Concept Scale, Piers, 1969; Coopersmith Self-Esteem Scale, Coopersmith, 1967) (Smoll et al., 1993). The internal consistency and six-week test-retest reliability of WSDQ scores have been acceptable (Smoll et al., 1993). In the present study, coefficient alpha for these 14 items ranged from .83 to .87 across three waves of data collection.

*Procedures*

Permission to conduct this study was received from the University Institutional Review Board, the town council’s Parks and Recreation committee, the director of the Department of Parks and Recreation, and the league supervisor. One team was randomly selected to receive the psychosocially-based coach training intervention and the other to receive a non-psychosocially-based injury prevention training program. Registration for the swim league was conducted by the Department of Parks and Recreation. Recruitment of participants for this study was conducted during the first week of practice. Letters and parental consent forms were sent home to parents informing them about the study and requesting their permission for their child’s participation. After receiving parental consent, research assistants who were blind to randomization status approached the youth, described the study, and requested informed assent (for participants age 13 or younger) or informed consent (for participants age 14 or older). Coaches from the two teams (N = 7) were told that the study was designed to examine the effects of coaching on children and youth who participate in sports and their informed consent was obtained during the first week of practice. All coaches agreed to participate.

*Assessment*

Assessments were conducted at three time points, beginning-of-season, mid-season, and end-of-season. At each assessment point, the participants completed a battery of measures of which the WSDQ was one instrument. The beginning-of-season assessment (prior to the intervention) was conducted
following a practice during the first week of the season; the midseason assessment 4 weeks later; and the end-of-season assessment was conducted 7 weeks after the beginning-of-season assessment.

**Coach training**

The coach training programs were delivered during the second week of the season (after the beginning-of-season assessment). Coaches in the control group \((N=3)\) received a 2-h training program on injury prevention and emergency first aid delivered by a certified Athletic Trainer. During the workshop, coaches received a packet of handouts summarizing the techniques being taught. Coaches in the experimental group \((N=4)\) received a training program based on the principles of Coach Effectiveness Training (Smith & Smoll, 1996). Similar in content and structure to CET, the intervention was a 2-h cognitive-behavioral training program that included educational, role-playing, and self-monitoring components. The educational component emphasized youth consequences of coaching behaviors and of how coaches evaluate failure and success. Specifically, it addressed the benefits of and techniques for building a strong and healthy relational context, creating a mastery achievement goal climate, employing instructive and supportive coaching behaviors, and eliminating punitive coaching behaviors.

An advanced graduate student in Kinesiology specializing in Sport Psychology and a first-year graduate student specializing in Human Development and Family Studies who was formerly a competitive age-group swimmer conducted the training program. The trainers worked under the supervision of one of the authors, who is a sport psychology consultant certified by the Association for the Advancement of Applied Sport Psychology and is listed on the Sport Psychology Registry of the United States Olympic Committee. Coaches were also given a copy of the Coach Effectiveness Training booklet (Smoll & Smith, 1997), which also summarized key principles of this intervention.

**Behavior observation coding**

Each coach was videotaped for approximately one hour in the course of a practice during the first and third weeks of the study (i.e. prior to and following training). A research assistant who was blind to training selected brief segments for coding based on (a) representativeness of content, (b) clarity of the audio recording, and (c) density of coaching communication (i.e. amount of communication within the segment). The mean length of segments was 5 min, 50 s \((SD=62\ s)\).

Coaching behaviors were coded using the Coaching Behavior Assessment System, which codes 12 distinct coach behaviors (CBAS; Smith, Smoll, & Hunt, 1977a,b). Three coders, who were not authors of this paper and were blind to experimental condition, studied the CBAS training manual (Smith et al., 1977b), completed the CBAS audiovisual training module (Smith, Smoll, Hunt, & Clarke, 1976), passed the calibration test with at least 90% accuracy, attended a 2-h coder training program run by the authors, and coded two 5-min segments of swim practices with at least 90% accuracy compared to the authors’ codes. These three coders then coded coach behaviors from the videotape segments. Inter-coder agreement (i.e. Cohen’s kappa [Cohen, 1968]) for three tapes was very good \((\kappa=.70,\ \text{weighted}\ \kappa=.76;\ \text{Landis}\ \&\ \text{Koch},\ 1977)\). The authors resolved disagreements. This level of agreement corresponds to at least 85% observer accuracy (Bakeman, Quera, McArthur, & Robinson, 1997). One randomly selected tape was coded in its entirety and the profile of CBAS codes for the segment was almost identical to the profile for the entire tape less the selected segment \((r=.97)\), indicating excellent representativeness of the 5-min segments.
Intervention effects on coach behaviors

Prior analyses conducted as part of the larger project indicated that the training program had a desirable effect on coach behavior (Conroy & Coatsworth, 2004). Training effects were strongest for the CBAS codes of general encouragement, general technical instruction, punitive mistake-contingent technical instruction, punishment, and reward/reinforcement. Compared to coaches trained in injury prevention, psychosocially trained coaches increased their rate of reward/reinforcement more. They also demonstrated consistently higher levels of general technical instruction and maintained higher levels of general encouragement. The results indicate that the intervention was effective in changing coach behavior, one important aspect of the athlete-coach relational context.

Results

Aim 1: Changes in Self-Esteem Over Time

The latent structure of self-esteem over time

Our first step in investigating changes in self-esteem over time involved establishing the factorial structure and longitudinal factorial invariance of the self-esteem measure over the study’s 7-week interval.2 Analyses were conducted using AMOS software (Arbuckle, 1994). Although previous research indicated a single 14-item factor for WSDQ scores (Smoll et al., 1993), an accumulating literature suggests that negative wording or reverse-keying of items on self-esteem measures introduces systematic variance (Marsh, 1996; Motl & DiStefano, 2002; Tomás & Oliver, 1999). Therefore, we tested a series of plausible models using responses to the 14 WSDQ items from all three measurement points.3

Results of these analyses indicated that failing to attend to systematic variance associated with negatively-worded/reverse-keyed items reduced model fit substantially. Results also indicated that the best fitting and most parsimonious model consisted of two correlated factors representing positive and negative self-esteem. Because the fit of this model was still not optimal, we conducted separate longitudinal factorial invariance analyses for forward and reverse-keyed items using procedures outlined by Meredith (Meredith, 1993; Meredith & Horn, 2001). Comparison of absolute and relative fit indices between nested invariance models indicated that the model with reverse-keyed items failed to achieve weak factorial invariance whereas, the model with forward-keyed items achieved strong factorial invariance (i.e. equivalent item-factor regression coefficients and item intercepts across time), an acceptable standard for investigating change over time (Sayer & Cumsille, 2001). Accordingly, all

2 Invariance in this study was examined as longitudinal invariance. Alternative models of invariance might include invariance across ages or gender. In this study we assumed invariance across these dimensions, but did not test for it.

3 We also examined whether missing data would be a concern. The probability of ‘missingness’ (i.e. number of missed measurement occasions) was not significantly correlated with initial scores on the positively-worded WSDQ items, r(133) = .01, p > .05, negatively-worded WSDQ items, r(134) = .12, p > .05, or total WSDQ scores, r(133) = −.06, p > .05. These findings suggested that attrition was not a function of prior status on self-esteem so data were assumed to be missing at random (Graham, Hofer, Donaldson, MacKinnon, & Schafer, 1997; Schafer & Graham, 2002), and the model parameters were generated using full information maximum likelihood estimation (Enders & Bandalos, 2001). An independence model was estimated separately using an augmented covariance matrix that included means; this model was used to calculate relative fit indices.
subsequent analyses were conducted using the six forward-keyed WSDQ items that represented a 
positive self-esteem factor. Specific details on fit indices and parameter estimates from each of these 
analyses are presented in a technical report available from the first author. Table 1 presents 
descriptive statistics for the six forward-keyed items. As seen in the table, internal consistency 
estimates for positive self-esteem scores at each wave were acceptable.

**Modeling change in self-esteem over time**

The second step in our analytic plan was to examine the best way to model change in positive self-
estime over the seven-week period. A series of unconditional LGC models were specified to establish 
the nature of changes in positive self-esteem latent means (McArdle, 1988; Meredith & Tisak, 1990). 
The measurement model was specified with the strong factorial invariance constraints described above and a second-order intercept factor was added to represent the mean positive self-esteem score at the beginning of the season; a second-order slope factor also was added for the linear trajectory growth 
model to represent the average weekly change in positive self-esteem scores (Sayer & Cumsille, 2001). 
Regression coefficients between the second-order intercept factor and the three first-order positive self-
estime factors were fixed at 1. Several mathematically equivalent approaches are available for 
identifying the means in this model. Because the intercepts of the latent variables were our primary 
interest, the intercepts for manifest variables and first-order factors were fixed to zero and the mean of the 
second-order intercept factor was freely estimated.

First, fixed and random coefficient no growth models were estimated and compared. As seen in 
Table 2, the random coefficients no growth model fit the data significantly better than the fixed 
coefficients no growth model. This indicated that significant variability existed in participants’ initial 
(beginning-of-season) positive self-esteem scores.

Next, we tested whether self-esteem means changed over the three assessments. A linear trajectory 
growth model was specified by adding a second-order slope factor to the random coefficients model 
described above (Sayer & Cumsille, 2001). Parameters between the slope factor and the three positive self-esteem factors were fixed at 0, 3, and 6 to index the rate of weekly change relative to the initial wave of data collection. In this way, the intercept represented the latent mean at the preseason assessment and slope represented the rate of change in positive self-esteem per week. As seen in Table 2, the random-intercepts, fixed-slope linear trajectory model fit the data significantly better than the random-effects no growth model. A complete random coefficients model could not be estimated because the variance of slope was inadmissible (var. = −0.00). Given that this inadmissible variance was so close to zero, the best model for describing unconditional growth in positive self-esteem appeared to be the random intercepts-fixed slope model with a linear growth trajectory (P. Curran, personal communication, August 1, 2003). Estimates from this model revealed significant variability in initial positive self-esteem scores 
for participants and a consistent trend for all participants to increase positive self-esteem over the course 
of the study (0.02 units per week).

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4 Unpublished data from a sample of female recreational softball players aged 8–18 years indicated that positive self-esteem scores from the six forward-keyed WSDQ items were strongly related to overall scores from the Rosenberg Self-Esteem Scale, \( r(93) = .66, p < .001 \), and that this correlation was comparable to that between the 14-item WSDQ score and the Rosenberg Self-Esteem Scale, \( r(93) = .70, p < .001 \) (Conroy & Coatsworth, 2002). Additionally, the positive self-esteem scores in the present 
data correlated strongly with negative self-esteem scores within each time point (\( r \) ranged from .51 to .57, all \( p < .01 \)).
Aim 2: main and moderated effects of the coach training intervention

To address the study’s primary research aim, we tested three hypotheses investigating the main and moderated effects of the coach-training program on rates of change in self-esteem. Whether change in youth positive self-esteem was associated with coach training, was tested using a conditional random-intercepts, fixed-slope LGC model. Table 3 presents the results of a series of models in which coach-training group, age and gender were used to predict the second-order intercept and slope factors. Of particular interest in this study are the results predicting slope (i.e. rate of weekly change in positive self-esteem).

Hypothesis 1 predicted that youth who swam for psychosocially trained coaches would show a greater increase in self-esteem than youth who did not. As indicated in Table 3, experimental group

<table>
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<th>Wave 2</th>
<th>Wave 3</th>
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Table 1
Descriptive statistics for forward-keyed items across the three waves

- **Aim 2: main and moderated effects of the coach training intervention**
was not a significant predictor of change in self-esteem, indicating a lack of a main effect for coach training.

Hypothesis 2 predicted that intervention effects would be most pronounced for younger rather than older youth. The significant group $\times$ age interaction supported this prediction. Further partitioning of the effect indicated that the rate of change varied as a function of age for participants in the experimental group but not for participants in the control group. The greatest benefits of the psychosocial coach-training program were evident for youth age 11 and younger. The rate of positive change for 12–13-year-old participants in the experimental group appeared to be equivalent to the rate of change for participants in the control group. Older participants in the experimental group (age 14–17 years) were the only group to exhibit a small decrease in positive self-esteem over the course of the season.

<p>| Table 2 |
| Fit indices and parameter estimates for longitudinal growth curve models—positively-keyed items only |</p>
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<thead>
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<th>df</th>
<th>$\chi^2$</th>
<th>NFI</th>
<th>NNFI</th>
<th>CFI</th>
<th>RMSEA (90% CI)</th>
<th>Intercept, $M$ (SE)</th>
<th>Slope, $M$ (SE)</th>
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<tbody>
<tr>
<td><strong>No of growth models</strong></td>
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<td></td>
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<tr>
<td>Fixed effects</td>
<td>144</td>
<td>354.68</td>
<td>.67</td>
<td>.76</td>
<td>.77</td>
<td>.10 (.09–.12)</td>
<td>3.46 (.04)*</td>
</tr>
<tr>
<td>Random effects</td>
<td>143</td>
<td>263.43</td>
<td>.76</td>
<td>.86</td>
<td>.87</td>
<td>.08 (.06–.09)</td>
<td>3.45 (.05)*</td>
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<tr>
<td><strong>Linear trajectory model (random effects for intercepts)</strong></td>
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<tr>
<td>Fixed effects</td>
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<td>253.29</td>
<td>.77</td>
<td>.87</td>
<td>.88</td>
<td>.08 (.06–.09)</td>
<td>3.38 (.05)*</td>
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<tr>
<td>No growth (fixed)—no growth (random)</td>
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<tr>
<td>No growth (random)—linear trajectory (fixed)</td>
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<tr>
<td>Note: *$p &lt; .01$.</td>
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</tr>
</tbody>
</table>

was not a significant predictor of change in self-esteem, indicating a lack of a main effect for coach training.

Hypothesis 2 predicted that intervention effects would be most pronounced for younger rather than older youth. The significant group $\times$ age interaction supported this prediction. Further partitioning of the effect indicated that the rate of change varied as a function of age for participants in the experimental group but not for participants in the control group. The greatest benefits of the psychosocial coach-training program were evident for youth age 11 and younger. The rate of positive change for 12–13-year-old participants in the experimental group appeared to be equivalent to the rate of change for participants in the control group. Older participants in the experimental group (age 14–17 years) were the only group to exhibit a small decrease in positive self-esteem over the course of the season.

| Table 3 |
| Parameter estimates for hypothesized predictors of initial status and growth |
| Intercept | Slope |
|---|---|---|---|
| Estimate | Standard error | Critical ratio | Estimate | Standard error | Critical ratio |
| Group | 0.06 | 0.09 | 0.64 | 0.01 | 0.01 | 0.62 |
| Age | 0.02 | 0.02 | 0.98 | -0.01 | 0.00 | -1.62 |
| Gender | -0.13 | 0.09 | -1.38 | 0.02 | 0.01 | 1.16 |
| Age $\times$ gender | -0.01 | 0.04 | -0.24 | 0.00 | 0.01 | -0.06 |
| Group $\times$ age | 0.09 | 0.04 | 2.12* | -0.02 | 0.01 | -2.96** |
| Group $\times$ gender | 0.01 | 0.19 | 0.04 | -0.04 | 0.03 | -1.30 |
| Group $\times$ age $\times$ gender | -0.03 | 0.09 | -0.38 | 0.02 | 0.01 | 1.63 |
| Group $\times$ initial SE | 0.09 | 0.17 | 0.52 | -0.06 | 0.03 | -2.20* |
| Group $\times$ initial self-esteem $\times$ gender | -0.71 | 0.34 | -2.12* | 0.14 | 0.05 | 2.67** |
| Group $\times$ initial self-esteem $\times$ age | -0.04 | 0.07 | -0.52 | -0.00 | 0.01 | -0.39 |
| Group $\times$ initial self-esteem $\times$ age $\times$ gender | 0.21 | 0.15 | 1.40 | -0.01 | 0.02 | -0.32** |

*p < .01, **p < .05.
Hypothesis 3 predicted that intervention effects would be most evident for youth who started the season with low levels of self-esteem. The significant group \times initial level of positive self-esteem interaction provided support for this hypothesis. This finding was clarified further by the significant group \times initial level of positive SE \times gender interaction term. Partitioning this effect revealed that the group \times initial level of positive self-esteem interaction effect was operating exclusively for girls.

As depicted in Fig. 1, boys and girls from both conditions who started the study with high levels of positive self-esteem maintained those high levels over the seven weeks. Although high positive self-esteem girls from the control condition showed a slight decline, it was not significant. In contrast to this pattern, youth who started the study with low levels of positive self-esteem tended to increase over 7 weeks. This pattern was evident for both males and females from both conditions. Rates of change for boys with low positive self-esteem did not differ across conditions; however, girls who swam for psychosocially-trained coaches improved their positive self-esteem more than girls from the control condition.

Discussion

The primary aims of the present study were to study change in the self-esteem of youth swimmers over the course of a 7-week summer season and to investigate the influence a coach-training workshop
might have on these changes. Four important findings emerged from our analyses. First, results provide important information about measurement of self-esteem and modeling changes in self-esteem over brief intervals. Second, although youth started the season with highly variable levels of self-esteem, on average they demonstrated small increases in self-esteem over the course of the season. A third important finding that ran counter to our hypothesis indicated no significant main effects of the intervention on changes in youth self-esteem. Fourth, a set of findings lent partial support for our moderation hypotheses, with age, gender and initial levels of self-esteem emerging as important moderators of intervention effects. The intervention proved more successful in improving self-esteem for younger youth, and for girls with initially low levels of self-esteem.

Measuring and modeling changes in self-esteem

Findings suggest that careful consideration of measurement issues is critical for understanding intervention effects. Our analyses of the psychometric properties of WSDQ scores suggested method effects associated with the direction of item keying (e.g. forward vs. reverse) and are partially consistent with recent studies on other self-esteem measures (Horan, DiStefano, & Motl, 2003; Marsh, 1996; Motl & DiStephano, 2002; Tomás & Oliver, 1999). Attempts to model self-esteem as a single latent variable using the 14 items of the WSDQ and to establish a factorial invariance over three assessment points failed and problems with this model could not be resolved by adding a response style factor as other researchers have done (e.g. Horan et al., 2003; Marsh, 1996; Motl & DiStefano, 2002; Tomás & Oliver, 1999). Nevertheless, a parsimonious model of correlated positive and negative self-esteem factors showed adequate, but not entirely satisfactory, fit. The superior longitudinal factorial invariance of the forward-keyed items (positive self-esteem) and the poor longitudinal factorial invariance of the reverse-keyed items (negative self-esteem) led us to use the forward keyed-items exclusively in our subsequent analyses of change. Using any of the other models in our tests of intervention effects would have introduced extraneous measurement error and may have compromised the validity of conclusions.

Our analyses also provided information about how best to model changes in positive self-esteem over time. Results from a series of unconditional latent growth curve models revealed significant variability in initial levels of positive self-esteem (i.e. random intercepts) across youth. While the finding that youth started the study with different levels of positive self-esteem is not too surprising, it does have important implications for evaluating intervention effects. Specifically, statistical models that are sensitive to inter-individual variability will shed more light on intra-individual developmental processes (such as changes in self-esteem) than will models that describe average group change alone (see Curran & Hussong, 2002). A common approach to evaluating effects of coach training has been to use fixed effects analyses that emphasize average group change. Our findings, however, suggest that a fixed effects model would not have accurately represented the intervention effects.

Effects of the coach training workshop

The primary purpose of this study was to evaluate whether coach training influenced changes in young athletes’ positive self-esteem over the course of a seven-week summer swim season. Coach training did not uniformly predict the rate of intra-individual change in positive self-esteem. Our results did reveal several important moderators, which can be equally important for understanding the effects of an intervention (Brown & Liao, 1999; Conduct Problems Prevention Research Group, 2002). Analyses
of intervention moderators allow investigators to examine for whom interventions are most effective. In turn, this information can be used to target the application of the intervention for specific populations or to modify the intervention so that it has greater generalizability.

In support of our prediction and previous research (Smoll et al., 1993), coach training had a greater effect for those youth who entered the study with low levels of positive self-esteem. This important finding adds to a growing body of literature indicating that interventions are often most effective for those participants who stand to benefit from them the most (Brown, 2003; Greenberg, Kam, & Kusche, 2003; Smith & Smoll, 1990; Smoll et al, 1993). A major difference between the present results and the related work of Smoll and Smith is that their results were based on responses to both forward and reverse-keyed WSDQ items whereas the present results focused only on change in forward-keyed WSDQ items.

In contrast to results of Smoll et al. (1993), the effects for low positive self-esteem youth in the present study occurred exclusively for girls. Smoll and colleagues obtained their results with a sample of boys participating in a youth baseball league. In the present study, males with low positive self-esteem who swam for psychosocially-trained coaches increased their positive self-esteem, but not more than males in the control group. In the Smoll et al. study, boys in the control group did not increase their self-esteem over the course of the season. It is possible that this discrepancy reflects the inclusion or exclusion of reverse-keyed self-esteem items; however, the large correlation between forward- and reverse-keyed items suggests that this explanation may not be entirely correct. An alternative explanation is that youth in the control condition of the present study were exposed to good coaching despite the coaches not having received a psychosocially based training program (Smoll et al. did not code coach behaviors so it was not possible to compare the behaviors control group coaches across studies). It is also possible that, although coaches in our intervention condition differed from control coaches on their overall levels of positive behaviors, control coaches may have unintentionally targeted low positive self-esteem youth for special attention. Good coaches may naturally provide added attention to youth who exhibit signs of low self-esteem.

One interesting possibility for why the effect was stronger for girls is that all of the coaches in the intervention condition were female. In comparison, two of the coaches in the control condition were female while one was male. One of the primary mechanisms by which youth sports may influence self-esteem is through processes of bonding to important persons (e.g. coaches) and/or institutions (e.g. schools) that can enhance relational contexts (Marsh & Kleitman, 2003; Tracy & Erkut, 2002). Girls with low self-esteem may have more easily identified with the female coaches in the intervention condition. This identification may have more readily facilitated an internalization of the coaches’ positive messages. Likewise, having coaches of both genders may change the dynamics of the relational context in important ways and inhibit bonding.

Results also supported our hypothesis that age would moderate the effects of coach training such that the intervention would be more effective with younger youth (age 11 and below) than with older youth (age 12 and above). Younger children are less cognitively mature, their thinking is more concrete and they rely more on direct feedback and easily interpretable sources of evaluation such as parents’ or coaches’ comments. Thus, younger youth are more likely to use the praise, attention and reinforcement given by important adult figures as a source of information on which to base their self-esteem (Harter, 1999; Horn & Weiss, 1991). Use of parent and other adult feedback becomes less central in the early teenage years and peer feedback about competence appears to increase in level of importance (Horn & Weiss, 1991). As youth move into adolescence and develop greater abstract cognitive skills, they also
tend to internalize achievement standards, modify these based on their own evaluation of performance and rely more on personal judgments than on external sources of information to evaluate self (Horn & Harris, 2002). If a similar pattern of developmental differences characterized youth in the present study, then the youngest children would be more likely to respond differentially to the support and instruction given by the coaches.

An alternative explanation for these results is that younger children may be more likely to experience noticeable improvement in their skill levels when compared to older youth, thereby eliciting more praise and encouragement from peers and coaches. Our data were not able to address this plausible alternative explanation and future research examining the mechanisms and relative contribution of coaches and peers for the self-esteem of youth at different ages would be valuable.

Some theorists might be surprised by this study’s finding of changes in global self-esteem for some youth over a relatively short period. Some suggest that global self-esteem operates much like a trait, and is hard to modify because it is likely acquired early in development and also leads individuals to seek out the kinds of information that reinforces and confirms the self view (Baumeister, 1993; Swann, 1996). Others suggest that self-esteem is less stable and demonstrates considerable variability and change over time and situation (Kernis, 1993; Kernis & Goldman, 2003). One reason that global self-esteem might change in the context of a brief activity, such as a summer swim season, is that changes occur within lower-order domain specific self-perceptions (e.g. physical, athletic, academic) (see Fox & Corbin, 1989; Harter, 1998; Marsh, 1993b for hierarchical models of self-esteem) which, in turn, influence global self-esteem. The current study did not assess subdomains, and thus, the findings might actually underestimate the effects on self-esteem. Future studies could broaden the measurement to include a hierarchical measure of self-esteem and other related measures to test whether stronger effects are found for specific subdomains (e.g. physical/athletic self-esteem) or other aspects of self (e.g. body image, flexible gender identities; Richman & Shaffer, 2000) mediate the relations between sport participation and change in global self-esteem.

Similarly, the current study did not assess youth perceptions of the importance of the domain. High self concept in domains of high importance is related to higher global self-esteem (Harter, 1998). Youth participating on a summer swim team are likely to vary considerably on the importance they give to swimming as a source information about self, and such ratings may moderate how responsive youth are to features of the athlete-coach relational context and hence, the effect of a coach-training intervention.

Limitations and future directions

Some limitations of this research also warrant notice. The most obvious limitation of this study was that the sample was smaller than those from previous evaluations of coach-training interventions (Smith et al., 1979, 1995). One potential counterbalancing factor of our design was an additional wave of measurement that enhanced statistical power (Muthén & Curran, 1997; Venter, Maxwell, & Bolig, 2002). Another limitation of the sample was that despite its diversity with respect to age and gender, it was relatively homogeneous for race and SES (characteristic of the community in which the study was conducted). Research on coach training program effects with more diverse populations and in more diverse community settings is needed to more completely understand for whom and under what conditions this kind of intervention is effective.
Other limitations related to the small sample include restriction to a single sport and number and gender of coaches involved. The current study was confined to a single sport and that may have introduced some selection bias into the study. Swimming may be more appealing to some youth whereas soccer or baseball may attract youth with different characteristics. Extending studies across sports is an important goal for future research. Second, with only two teams in the study, it may be that they differed in overall success and those participants on the more successful team showed greater increases in self-esteem. This conclusion is not entirely satisfactory since prior evidence suggests that psychosocial training is unrelated to team win-loss records (Smith et al., 1979). Future research studies that included more teams could appropriately address this question in the context of their analyses. Because the study included only two teams and relatively few coaches, it was not possible to investigate some important research questions such as whether characteristics of the coach (degree of prior training, years experience, age) or the gender match (or mismatch) of athlete-coach influences the quality of the athlete-coach relational context and consequently, any changes in athletes’ self-esteem.

Our study focused on how an intervention to enhance the athlete-coach relational context could promote self-esteem in youth. One limitation, however, was that we were only able to use observational measures of coaches’ interpersonal behavior to operationalize the relational context. Hinde and colleagues (Hinde, 1997; Hinde, Finkenauer, & Auhagen, 2001) note that relationships are complex and have properties beyond individual-level behavior (e.g. coach behaviors). Future studies investigating how the athlete-coach relational context influences self-concept would benefit from measurement of additional relationship properties such as dyadic properties (e.g. reciprocity, complementarity) or qualities of the interactions between coach and youth (Hinde, 1997). Moreover, there would be benefit to exploring the influence of youth and coach perceptions of the relationship as distinct, but possibly related aspects of the relationship (Hinde, 1997). These aspects of social relationships are likely to be strongly related to self-concept in complex and reciprocal ways (Hinde et al., 2001). Another possible fruitful approach might be to follow the lead of self-determination theorists (Ryan & Deci, 2000) who propose that concerns about the worth of oneself reflects a deprivation of basic needs for competence, autonomy or relatedness (Deci & Ryan, 1995). Creating contexts and social interactions, such as healthy sport environments with well-trained coaches, which are able to satisfy those unmet needs are likely to enhance low self-esteem.

The current study also provides some guidance for future research in this area. First, the magnitudes of the effects from this study are small to modest. One possible explanation for this is that the intervention consisted entirely of a single 2-h workshop, identical to the length of the CET interventions (Smoll et al., 1993). Future studies could test various modifications of the intervention intended to strengthen the effects such as: increasing the number of sessions, introducing booster sessions, adding self-monitoring procedures, or providing ongoing direct feedback to coaches. Enhancing the diversity of the study sample is also an important direction for future research. The present study was conducted with a homogenous US sample and caution should be taken when generalizing to other populations. An important extension of this research might test whether the intervention was as effective with participants from different countries, diverse racial/ethnic backgrounds, or different socioeconomic circumstances.

In sum, the current study provided an opportunity to extend our understanding of the effects of coach training programs on youth self-esteem in four important ways. First, the study randomly assigned teams to experimental and control conditions to minimize biases due to selection effects (e.g. into specific league, by specific coaches) and to reduce potential baseline differences (Conroy & Coatsworth, 2004).
Second, while prior empirical studies on coach-training have been limited to relatively homogenous samples of 10–12-year-old boys playing Little League baseball, the current study included a mixed-sex, mixed-age sample of children and youth in a summer swim league. Establishing the efficacy of coach training programs in more heterogeneous populations (e.g. with other sports, girls or mixed-sex groups, and a wider range of ages) is an important goal for coach training researchers. Third, the study incorporated more measurement points (3) than past studies (2), thereby providing more accurate estimates of change, facilitating evaluations of hypothesized effect mechanisms, and enhancing statistical power to detect effects (Venter et al., 2002). Finally, this study uses random effects models that accounted for intra-individual developmental changes as well as between group (e.g. intervention vs. control) mean level changes. These models permit initial levels and rates of change on self-esteem to vary for individual participants and thereby can uncover theoretically meaningful variance and enhance understanding of program effects (Collins & Sayer, 2001; Willett & Sayer, 1994). Participants exhibited significant variability in their starting values for positive self-esteem and a general tendency to increase positive self-esteem over the season. Girls who entered the study with low levels of positive self-esteem benefited most from their time with psychosocially trained coaches.

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References


