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The Effects of Autonomy-supportive Coaching, Need Satisfaction and Self-Perceptions on Initiative and Identity in Youth Swimmers

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Abstract

This study tested a sequential process model linking youth sport coaching climates (perceived coach behaviors and perceived need satisfaction) to youth self-perceptions (perceived competence and global self-esteem) and youth development outcomes (initiative, identity reflection, identity exploration). A sample of 119 youth between the ages 10–18 who participated in a community-directed summer swim league completed questionnaires over the course of the seven-week season. Results indicated that coaches' autonomy support, particularly via process-focused praise, predicted youth competence and relatedness need satisfaction in the coaching relationship. Youth competence need satisfaction predicted self-esteem indirectly via perceived competence. Finally, self-esteem predicted identity reflection and perceived competence predicted both identity reflection and initiative. Effects of age, sex, and perceptions of direct contact with the coach were not significant. Findings suggest that the quality of the coaching climate is an important predictor of the developmental benefits of sport participation and that one pathway by which the coaching climate has its effect on initiative and identity reflection is through developing youth self-perceptions.

Keywords

youth sport; youth development; coaching climate; self-perceptions; self-determination theory

Participation in sports has been linked empirically to a number of positive developmental outcomes for children and adolescents including heightened academic achievement (Eccles & Barber, 1999), greater school retention (Mahoney & Cairns, 1997), better future occupational outcomes (Barber, Eccles, & Stone, 2001), superior social skills and confidence in peer relationships (Weiss & Ferrer Caja, 2002), better developed emotional awareness and regulation skills (Scanlan, Babkes, & Scanlan, 2005), higher levels of self-esteem (Bowker, 2006), and more initiative (Larson, Hansen, & Moneta, 2006). Yet, it is also important to recognize that these effects reflect a general, or average, effect for a group of youth who participate in organized sports compared to youth who do not.

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Youth sport participation is unlikely to influence all individuals in the same way. Indeed, it is unclear why playing a sport or being a member of a sport team alone should have an overall direct effect on positive youth development (Danish, Taylor, & Fazio, 2003). Effects of youth sport participation are likely to be indirect and dependent on interpersonal and intrapersonal processes that operate within the sport context (Larson et al., 2006). Moreover, distinguishing the *quality* of youth experience from the *quantity* may be central to understanding socialization and developmental processes in sport (e.g., Danish & Gullotta, 2000).

In this short-term longitudinal study of young athletes' experiences over the course of a seven-week summer swim season, we tested a model in which the relations between youth sport participation and developmental outcomes were a function of the coaching climate and youth self-perceptions (Conroy & Coatsworth, 2006). The conceptual model guiding this research is shown in Figure 1, and draws primarily from self-determination theory (SDT; Ryan & Deci, 2000) and developmental theories of self-perception (Harter, 1999). The model specifies a series of indirect links such that the perceived coaching climate (i.e., perceived coaching behavior and need satisfaction with coaches) influences youth self-perceptions (i.e., perceived competence and global self-esteem) which in turn influence youth outcomes.

In this study we focused on the positive youth outcomes of initiative and identity (Larson et al., 2006). Sport appears to be a prime context for developing initiative, but the processes by which initiative develops in youth sport are not clear (Larson et al., 2006). We included the outcome of identity because sports have been conceptually identified as an important context for identity exploration and formation (Barber et al., 2001; Kleiber & Kirshnit, 1991), although evidence indicates that sport may have a weaker relationship than other organized activities with identity work (Larson et al., 2006). We emphasized both self-esteem and perceived competence because of strong evidence linking sport participation and self-esteem (Fredricks & Eccles, 2006; Marsh & Kleitman, 2003) and because of their relationship in hierarchical, multidimensional models of the self. Such models propose that participation-based effects on global self-esteem should emerge from changes in domain-specific self-perceptions (Fox & Corbin, 1989; Harter, 1998; Marsh, 1993). This evidence linking sport participation to emerging self-perceptions also suggests that identity may be a salient developmental consequence of sport participation.

Sport Participation and Self-Evaluations

Researchers in sport science have focused on the relation of sport and youth self-perceptions (Horn & Harris, 2002) in part because of the inherent evaluative nature of both the sport context and the self-system. Sport participation has been linked to higher self-esteem concurrently (Fredricks & Eccles, 2006) and prospectively (Marsh & Kleitman, 2003; Tracy & Erkut, 2002). Findings from these and other studies also indicate that the relations are likely to be indirect and may be moderated by important personal and contextual factors. Links between sport participation and global self-esteem are at least partially mediated by physical or athletic self-image, perceived athletic competence, and body image (Bowker, Gadbois, & Cornock, 2003; Richman & Schaeffer, 2000). Some results indicate a complex

relationship between sports participation and self-esteem that is partially mediated by perceived competence within a team sport, but not by perceived athletic competence generally (Pederson & Seidman, 2004). These studies suggest that sport participation is related to concurrent global self-esteem, future global self-esteem, and changes in global self-esteem, and that these relationships are a function not only of one's perceived physical competence, but also of aspects of the team or sport environment. The evidence across studies does not indicate whether this is equally true for both boys and girls across ages.

Coaching Climate and Athletes' Self Perceptions

Coaches can influence athletes' experiences and self-perceptions through their direct interactions with their athletes, as well as through the broader motivational climate they create in the sport context. Within our theoretical model (see Figure 1) we conceptualized the coaching climate as encompassing both the quality of specific coach behaviors and how youth perceive coaches' behaviors. Evidence indicates that these aspects of the coaching climate may influence youth's level of enjoyment and satisfaction (Baker, Yardley, & Côté, 2003), goal involvement (Treasure & Roberts, 2001), achievement motivation (Conroy, Kaye, & Coatsworth, 2006), and self-perceptions (Allen & Howe, 1998). Experimental manipulations of the coaching climate through coach training programs have demonstrated that youth who play for coaches trained to alter the quality of their interactions by behaving in more supportive, nurturing, encouraging, structuring, and non-hostile ways show greater changes in self-esteem (Coatsworth & Conroy, 2006; Smoll, Smith, Barnett, & Everett, 1993). Untested in these coach-training studies were theoretically-based models specifying which kinds of coach behavior influenced youth levels of self-esteem and the intrapsychic mechanism(s) leading to such change. In this study, we draw from SDT (Ryan & Deci, 2000) to investigate whether changes in young athletes' self-perceptions are a function of autonomy-supportive coach behavior, and youths' felt need satisfaction.

SDT suggests that autonomy-supportive interpersonal and social contexts will promote more self-determined motivation, well-being, and healthy development by satisfying three fundamental human needs: competence, autonomy and relatedness (Deci & Ryan, 2000). SDT has become a popular motivational framework for studying sport-related phenomena (cf. Hagger & Chatzisarantis, 2007), and as a consequence, greater attention has been focused on autonomy-supportive coach behaviors and the satisfaction of athletes' basic psychological needs. Autonomy-supportive coaching includes such practices as (a) providing choice for athletes, (b) providing a rationale for tasks and limits, (c) providing non-controlling competence feedback, (d) avoiding controlling behaviors such as criticisms, controlling statements and tangible rewards for interesting tasks, (e) acknowledging the athlete's feelings and perspectives, (f) providing opportunity for athletes to show initiative and act independently, (g) providing non-controlling feedback, and (h) avoiding behaviors that promote athlete's ego-involvement (Mageau & Vallerand, 2003). These coaching behaviors have been shown to influence athletes' motivation (Amorose & Anderson-Butcher, 2007, Gagné, Ryan, & Bargmann, 2003), physical activity (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003), and psychological well-being (Reinboth, Duda, Ntoumanis, 2004). Some evidence also demonstrates that coach behaviors influence athlete outcomes via basic psychological need satisfaction (Amorose & Anderson-Butcher, 2007; Reinboth, et

al., 2004). Gagné and colleagues (2003) tested longitudinal, sequential relations between coach autonomy support and need satisfaction and between need satisfaction and self-esteem; however, they did not specifically examine whether coach autonomy behavior influenced self-esteem indirectly via need satisfaction. The current study adds to the literature by testing this indirect pathway.

Self-Determination Theory and Self-Perceptions

Psychological need satisfaction was expected to be an important antecedent of perceived competence and self-esteem in this study. According to self-determination theory, a secure self-esteem is an element of well-being that derives from satisfaction of the basic needs for competence, relatedness and autonomy, and may result from the internalization of autonomy-supportive environments and relationships (Deci & Ryan, 1995, 2000). Satisfaction of these basic needs allows one to behave autonomously and agentically, providing for the development of true self-esteem (Ryan, 1993). This proposition is consistent with the view of self-esteem as a developmental outcome derived in part as a function of internalization of the affects and beliefs expressed in the quality of interpersonal interactions (e.g., supportive and accepting vs. demeaning and rejecting) with significant others (Cooley, 1902; Harter, 1999; Mead, 1934; Rosenberg, 1965). In light of the extensive literature demonstrating that self-esteem is grounded in domain-specific perceptions of competence (Harter, 1999), we expected competence need satisfaction and perceptions of swimming competence to be the strongest intervening factors between autonomy-supportive coaching and changes in self-esteem

The Current Study

The current study was guided by two aims that we tested in a single integrated model. The first aim was to test a process model relating the coaching climate to self-perceptions. We hypothesized that youth perceptions of their coaches' autonomy supportive behaviors would predict satisfaction of autonomy, relatedness, and competence needs in the coaching relationship. Second, we hypothesized that autonomy-supportive coaching behaviors would predict self-perceptions, and that this relationship would operate indirectly through need satisfaction. We also hypothesized that competence need satisfaction would show the strongest relationship with self-perceptions because, from a developmental perspective, competence is a primary basis for self-perceptions and self-evaluations (Harter, 1999). Third, we hypothesized that autonomy-supportive coaching behavior would indirectly predict youth self-esteem at the end of the season, operating in a bottom-up fashion through perceived competence in the sport (Fox & Corbin, 1989; Harter, 1998; Marsh, 1993).

Our second aim was to test a within-sport process model linking self-perceptions derived from the coaching climate to the positive youth outcomes of initiative (goal setting), identity exploration, and identity reflection (Larson et al., 2006). We expected a particularly strong relationship between perceived competence and initiative because of their common grounding in achievement motivation. We also expected that perceived-competence and self-esteem would predict identity reflection and exploration, although we expected that intrapersonal processes involved in perceiving and evaluating oneself (i.e., perceived

competence and self-esteem) would predict the cognitive dimension of identity reflection more strongly than it would predict the behavioral dimension of identity exploration.

Method

Participants

Participants were recruited from a community recreational swim league (77 girls, 40 boys, 2 did not report sex; N = 119). Participants ranged in age from 10–17 years (M = 12.07, SD = 1.79). This study's sample was predominantly Caucasian (88% of those reporting race/ethnicity) with smaller proportions reporting Asian-American (2.8%), Hispanic (1%), African-American (1%) and Other (7%). The season for this league lasted six weeks with practices held five days/week and meets held twice weekly. Participants learned to swim an average of 7.1 years previously (SD = 2.7) and had been swimming in this league for an average of 3.3 years (SD = 2.4).

Procedures

During the first practice of the season, research assistants described the study to prospective participants and a letter with a consent form was sent home to parents. The original study recruited all 8–18 year old swimmers and obtained a 54% participation rate (see Conroy et al., 2006). Because of the outcomes selected for the current study, we included only 119 youth between 10 and 18 years old (75% of original sample). Youth who provided informed consent to participate in the study completed a baseline assessment during the first week of the season. All measures used in this study, except the measures of positive youth developmental outcomes, were included in the baseline assessment. Throughout the season, youth completed questionnaire packets at the end of one practice session each week. One question from these packets assessed perceived coach involvement and was used in the present study. An end-of-season assessment was administered during the sixth and final week of swim practices. This assessment included all of the baseline measures and the measure of positive youth developmental outcomes. Measures were selected or constructed for the median age of this sample. Flesch-Kincaid grade level reading scores ranged from grade 2.8 to grade 6.6. Trained research assistants were available during all assessments to help participants who needed assistance.

Measures

Perceptions of coaches' autonomy support—Youth completed the 9-item Coaches' Autonomy Support Questionnaire (CASQ; Conroy & Coatsworth, 2007a) which assessed two forms of autonomy support: *Sincere Interest in Athlete's Input* (5 items; "My coaches ask for the team's opinion about what we should do in practice") and *Praising Autonomous Behavior* (4 items; "My coaches praise me for the decisions that I make in practice"). The two dimensions were derived through confirmatory factor analysis and were strongly correlated (r = .62; p < .01) (Conroy & Coatsworth, 2007a). Both demonstrated strong relations with youth-reported coach behaviors derived from a set of single items representing dimensions of the Coaching Behavior Assessment System (CBAS; Smith, Smoll, & Hunt, 1977), a common system for coding coach behavior, and the 12-item Perceptions of Coaches' Interpersonal Behavior Questionnaire (PCIBQ; Conroy &

Coatsworth, 2007b), which assesses youth perceptions of coach affiliation, control, and blame.

Need satisfaction in relationship with coaches—We adapted the 9-item Basic Need Satisfaction in Relationships Scale (LaGuardia, Ryan, Couchman, & Deci, 2000) to assess need satisfaction in participants' relationship with their coaches. Participants rated each item on a scale ranging from 1 (*not at all true*) to 7 (*very true*). Scores represented the degree to which participants' basic needs for autonomy (3 items; e.g., "When I am with the coaches, I feel free to be who I am"), competence (3 items; e.g., "When I am with the coaches I feel very capable and effective), and relatedness (3 items; e.g., "When I am with the coaches, I feel loved and cared about") were satisfied when they were with their swim coaches.

Perceived competence in swimming—Perceived competence in swimming was assessed using a three-item scale reported by Conroy, Coatsworth, and Fifer (2005) that was adapted from existing perceived competence measures (Fredricks & Eccles, 2002; Williams & Deci, 1996). Participants rated their perceived competence in swimming (e.g., "How good at swimming are you") on a scale ranging from 1 (*not at all good*) to 7 (*very good*). In previous research, scores from this scale have demonstrated evidence of factorial validity, acceptable internal consistency, and a pattern of theoretically-expected relations with constructs such as fear of failure, achievement goal adoption, situational motivation, basic psychological need satisfaction, and self-esteem (Conroy et al., 2005).

Self-esteem—We measured self-esteem using items from the self-report Washington Self-Description Questionnaire (WSDQ; Smoll, Smith, Barnett, & Everett, 1993). WSDQ scores have been used to measure global self-esteem in previous youth sport research, and exhibited strong positive correlations 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). Previous work indicated that only the six forward-keyed items representing *positive self-esteem* comprised a scale with acceptable psychometric properties for longitudinal analyses (Coatsworth & Conroy, 2006). Therefore, only the *positive self-esteem* dimension (e.g., "I like being the way I am") was used in this study. 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).

Positive youth development outcomes—Three scales from the YES 2.0 (Hansen & Larson, 2005), *initiative (goal setting)*, *identity reflection* and *identity exploration*, were used to index youth development outcomes in this study. These three scales were selected because of their conceptual proximity to self-perceptions in our sequential theoretical model. The goal-setting subscale of the *initiative* scale comprised 3 items reflecting the extent to which the athlete set and achieved goals for him or herself (e.g., "I set goals for myself in this activity"). *Identity reflection* consisted of 3 items (e.g., "This activity got me thinking about who I am"). The *identity exploration* scale also consisted of 3 items (e.g., "I tried doing new things"). Participants were asked to rate the extent to which they had each of the experiences listed on a scale ranging from 1 (*not at all*) to 4 (*yes, definitely*). Although

identity reflection and identity exploration are often combined into a single higher order scale of "identity work" (Larson et al., 2006), we elected to use these subscales separately for two reasons. First, these scales were only modestly correlated ($r = .23$; $p < .05$). Second, we anticipated distinct relations between the two identity dimensions and our two indicators of self-perceptions. For example, we hypothesized that perceived competence would predict the reflective element of identity (i.e., thinking about who I am) more strongly than it would predict the behavioral component (i.e., trying out new things).

Perceived coach involvement—At the beginning of every weekly questionnaire packet, participants were asked, "How many times did the coaches say something directly to you in today's practice?" An exploratory factor analysis (prior communality estimation with a maximum likelihood algorithm) indicated that responses to this item over six weeks had a unidimensional structure that accounted for 63% of the variance in responses. Based on these results, responses were aggregated into a single score representing youth perceptions of their coaches' involvement with them.

Data Analysis

The proposed model of relations between coaching behaviors, need satisfaction in relationships with coaches, perceived competence, self-esteem, and youth developmental experiences was tested in a single structural equation model. This model used scale scores as input variables and full information maximum likelihood estimation. Before interpreting individual paths, we evaluated model fit using both absolute and relative fit indices. We used the chi-square statistic as an absolute index of fit, and the Normed Fit Index (NFI: Bentler & Bonnet, 1980), the Comparative Fit Index (CFI: Bentler & Bonnet, 1980), and the root mean square approximation (Browne & Cudeck, 1993) as relative indexes of fit. For the NFI and CFI, we used the standard of .90 and .95 as indicating acceptable and good fit, respectively.

Results

Descriptive statistics and internal consistency estimates for the scale scores used in this study are presented in the bottom three rows of Table 1. Responses to each scale spanned the full range of each scale and, with the exception of identity exploration, all scales exhibited a high level of internal consistency. None of the items from the identity exploration scale appeared to be singularly responsible for the low internal consistency, so the scale was retained and results were interpreted cautiously. Table 1 also presents a complete correlation matrix for all study variables.

A structural equation model was estimated to test the sequence of relations proposed between coaching behaviors, need satisfaction in relationships with coaches, perceived competence, self-esteem, and youth developmental experiences. Preliminary analyses included three variables that could confound our interpretation of relationships between the key constructs in the model we proposed: age, sex, and perceived coach involvement (a latent variable indicated by participants' weekly estimates of their number of comments their coaches made directly to them in that day's practice). Age and sex were important to examine because of expected developmental and sex differences in self-perceptions and

achievement motivation during adolescence. Perceived coach involvement was important to examine because it was possible that program effects could be due to youth feeling that their coaches were more or less engaged with them during the season. None of these variables accounted for significant variability in model variables so we ruled them out as potential confounds. For the sake of simplicity, the basic model of coaching behaviors, need satisfaction, perceived competence, self-esteem, and youth developmental experiences was estimated without the three potential confounds included and those results are presented below. Conclusions did not change from the model including the three potential confounds. Some paths that we expected to be null were also included in the model to ensure that we were not overlooking important, but unanticipated, relations.

The two forms of autonomy-supportive coaching behaviors were permitted to covary, and freed to predict scores for need satisfaction in relationships with coaches, end-of-season perceptions of competence, and end-of-season self-esteem. The three need satisfaction scores were permitted to covary, and freed to predict end-of-season perceptions of competence and end-of-season self-esteem. Perceived competence and self-esteem at the beginning of the season were permitted to covary, and freed to predict their corresponding end-of-season score. End-of-season perceived competence also predicted end-of-season self-esteem and the three youth development outcomes. End-of-season self-esteem predicted the three youth development outcomes (whose uniquenesses also were permitted to covary). This model exhibited an acceptable fit to the data: χ^2 (33) = 79.45, NFI = .92, CFI = .91, RMSEA = .11 (90% confidence interval = .08 – .14).

Figure 2 presents a path model displaying significant standardized coefficients of the model with non-significant paths omitted for clarity. The text that follows reports unstandardized coefficients, their standard errors, the corresponding standardized coefficients, and squared multiple correlations for endogenous variables (where appropriate). Coaches' praise for autonomous behavior positively predicted satisfaction of competence needs (b = 0.34, SE = 0.10, β = .36, p < .01; R^2 = .16) and relatedness needs (b = 0.46, SE = 0.10, β = .45, p < .01; R^2 = .24). Coaches' interest in athletes' input was unrelated to need satisfaction. These three needs were significantly correlated with each other ($cov_{\text{autonomy-competence}}$ = 1.44, SE = 0.24, r = .77; $cov_{\text{autonomy-relatedness}}$ = 1.35, SE = 0.24, r = .70; $cov_{\text{competence-relatedness}}$ = 1.42, SE = 0.24, r = .76; p < .01). End-of-season perceived competence was significantly predicted by beginning-of-season perceived competence (b = 0.50, SE = 0.07, β = .54, p < .01) and competence need satisfaction (b = 0.36, SE = 0.09, β = .59, p < .01), but not by autonomy or relatedness need satisfaction (R^2 = .48). Perceived competence and self-esteem at the beginning of the season were positively associated (cov = 0.30, SE = 0.06, r = .53, p < .01). End-of-season self-esteem was predicted by beginning-of-season self-esteem (b = 0.52, SE = 0.07, β = .56, p < .01) and end-of-season perceived competence (b = 0.15, SE = 0.05, β = .24, p < .01; R^2 = .46). Youth identity reflection was associated with initiative (cov = 0.26, SE = 0.06, r = .49, p < .01) and identity exploration (cov = 0.12, SE = 0.06, r = .23, p < .05), but initiative and identity exploration were not significantly associated. Initiative was predicted by end-of-season perceived competence (b = −0.23, SE = 0.09, β = −.28, p < .01), but not end-of-season self-esteem (R^2 = .12). Identity reflection was predicted by both end-of-season perceived competence (b = −0.30, SE = 0.10, β = −.31, p < .01) and self-esteem (b

= −0.41, *SE* = 0.16, β = −.26, $p < .01$; $R^2 = .23$). Identity exploration was not associated with either end-of season perceived competence or end-of-season self-esteem.

Discussion

This study tested a theoretically derived process model for understanding how one element of the youth sport context, the coaching climate, influences youth developmental outcomes. The model hypothesized a pattern of direct and indirect effects of coach behaviors that would lead to youth development outcomes. The proposed sequential model fit the data for this sample of youth swimmers. As hypothesized, coaches' autonomy-supportive behavior during the season predicted satisfaction of athletes' basic psychological needs. Need satisfaction in turn predicted youth self-perceptions, and youth self-perceptions ultimately predicted positive youth developmental outcomes.

Several important findings emerged from this study. First, it was the praising autonomous behavior dimension of autonomy-supportive coaching behavior and not the sincere interest dimension that predicted youth need satisfaction. In addition, contrary to expectations, this form of coach behavior predicted competence and relatedness need satisfaction, but not autonomy need satisfaction. Second, the bridge between youth need satisfaction in the coaching relationship and self-perceptions appeared to be through competence needs. Moreover, the relationship between coach climate and global self-esteem operated indirectly in a bottom-up fashion through youth domain-specific (i.e. swimming) perceptions of competence. Third, aspects of initiative and identity development associated with end-of-season self-perceptions, controlling for beginning-of-season self-perceptions.

It should be noted that our study was designed to focus on the sport context and address questions of within-sport variability in experiences and outcomes among currently participating youth. The within-sport design is a unique feature of the study that can be considered an asset or a liability. Studies using this kind of design are valuable because, in contrast to comparative designs which tend to address questions of whether sport participants differ from non-participants on specified developmental outcomes, they allow us to examine within-sport processes (Larson et al, 2006) and address questions about how the *quality* of youth sport experience matters for developmental outcome (Danish & Gullotta, 2000). Using a single sport may also be considered a liability because it is not certain that these findings will generalize to other sport contexts. The theoretical model tested was not developed specifically for the swimming context, however, in this study we cannot rule out the possibility there is something unique about being part of a summer swim team that would be different from developmental experience in other sport contexts. Additionally, although variability within the sample due to selection bias (e.g., youth who select into sports are different from youth who select into other activities) is somewhat controlled because all youth selected into this context, we cannot address whether youth who select into the swim context are different from youth who select into other sports.

Our finding that autonomy-supportive coach behaviors were important for youth need satisfaction adds to a growing literature documenting that when individuals in positions of authority provide autonomy support, the individuals with whom they are working show

higher levels of need satisfaction which leads to feelings of well-being (Deci & Ryan, 2000). This conclusion has been made previously in the literature on sport coaching (Amorose & Anderson-Butcher, 2007; Gagné et al., 2003), but our findings extend this work in several important ways. Past studies have examined these linkages in a piecewise manner (Gagné et al., 2003), or using cross-sectional data (Amorose & Anderson-Butcher, 2007). We tested a process model with indirect pathways using longitudinal data. Therefore, we tested for the significance of specific paths after controlling for prior levels of variables of interest and controlling for alternate paths. These controls increase confidence in the results and help to isolate the temporal sequencing of the process.

Our finding that the coach strategy of praising youth autonomous behavior was related to competence and relatedness need satisfaction was consistent with prior work (Amorose & Anderson-Butcher, 2007), but our finding that neither autonomy-supportive coaching behavior predicted autonomy need satisfaction was unexpected. Praise may be a particularly salient coach behavior in this setting as it indicates a very clear and direct communication between coach and youth that may signal the closeness of the relationship (relatedness) and the coaches' acceptance of an athlete's performance or ability (competence). In contrast, sincere interest (reflected in coaches' seeking youth opinions, offering choices, and listening to youths' ideas about what they should do in practice) may be less salient for youth in part because it is likely to occur less frequently. Youth in this study did report slightly lower levels of sincere interest than praise. Youth may simply be less sensitive to passive autonomy-support strategies (e.g., coaches expressing interest in them) than to active autonomy-support strategies (e.g., coaches praising autonomous behavior).

It should be noted that praise can be used in different ways by coaches, and different forms of praise can have distinct relations with youth outcomes. Sincere praise that focuses on promoting autonomy, as was the case in this study, is expected to promote motivation, sense of self and well-being (Henderlong & Lepper, 2002). Process-focused praise that highlights behaviors (e.g., "great job kicking all the way to the end") instead of the person as a whole (e.g., "you're a great swimmer") is known to engender mastery as opposed to helpless motivational responses and contingent self-worth in children (Cimpian, Arce, Markman, & Dweck, 2007; Kamins & Dweck, 1999). In contrast, praise that is contingent or too heavily reliant on social comparison can increase the salience of social evaluation, undermine intrinsic motivation, and produce more self-consciousness and contingent self-worth (Henderlong & Lepper, 2002). Nevertheless, praising youth autonomous behavior appears to be a coaching strategy that effectively contributes to youths' feelings that their basic human needs of competence and relatedness are being met in that context.

Our findings are also consistent with the literature indicating an effect of sport participation on youth global self-esteem (Marsh & Kleitman, 2003; Tracy & Erkut, 2002), that operates indirectly via perceived competence (Bowker, 2006). In this study we also tested relations between need satisfaction and global positive self-esteem but those relations were not statistically significant. Thus, we concluded that variability in coaching influenced changes in self-esteem indirectly through perceived competence. A particularly unique finding from this study involved the suggestion that this effect originated from coach behaviors that supported individual autonomy. Specifically, coaches who were perceived as giving praise

for effort, attitude, and behavior rather than solely performance outcome fulfilled youths' basic psychological need to feel competent. The evaluative nature of the sport environment means that it is a prime context for satisfaction or inhibition of the need for competence. When coaches are able to foster youths' sense that this need has been met, it contributes to their own perception that they are successful and competent in swimming. In turn, the perception of competence in the swim domain contributes to ones' global sense of self-esteem.

Two outcomes for which this model appears to be applicable are initiative and identity reflection. We predicted these would be related in part because of the conceptual proximity of competence related self-perceptions and competence related youth outcomes. The concept of initiative has strong motivational and achievement components related to goal setting and effort, which are also related to perceived competence (Conroy et al., 2005). The intrapersonal processes of private self-evaluations of one's competence and abilities that is reflected in levels of perceived competence and self-esteem (Harter, 1999) would naturally correspond to elements of identity reflection (i.e., "thinking about who I am"). The linkages may signal processes within a broader self-system in which context-specific evaluations lead to new ways of perceiving the self outside of that context. These self-related intrapersonal processes may also help explain cross-domain findings that youth sport participation is related to non-sport performance (Marsh & Kleitman, 2003).

Larson, Hanson and Walker (2005) have demonstrated that youth programming can enhance the development of initiative, and our results indicate that effective youth sport coaching can do the same. Initiative may be a particularly important set of skills to promote in youth, because this capacity for planful action appears to be increasingly important in a rapidly changing world (Larson 2000). Because initiative comprises a set of cognitive and behavioral skills, youth may be able to carry that capacity into the future and other settings. For example, it may be the development of initiative that helps explain why participation in youth sports is linked to performance in schools or other developmental settings (Eccles & Barber, 1999).

Likewise, promoting identify reflection within activities may have broader developmental effects. Youth who report greater levels of identity related processes within activities also report higher levels of general wellbeing (Coatsworth, Palen, Sharp, & Ferrer-Wreder, 2006) and lower levels of delinquency (Palen & Coatsworth, 2007). Although age is an important factor in identity processes (Erikson, 1968), we did not find age effects in our study. It is possible that this is due to our restricted sample, low level of internal consistency with our identity reflection variable, or the way we operationalized these constructs (for alternate ways of conceiving identity exploration and goals, see Luyckx, Goosens, Soenens, & Beyers [2006] and Elliot & Conroy [2005], respectively). Future research involving larger cohorts and longer longitudinal studies on the development of identity reflection and youth initiative in youth sports may help address age-related changes and may also be enriched by incorporating a broader achievement motivation framework that extends beyond the narrow self-regulatory strategy assessed in the present study.

These results also have implications for coach training programs. Our study indicates that teaching coaches to effectively use praise to support autonomy in their interactions with young athletes can have promotive effects. Other aspects of autonomy supportive coach behaviors have been proposed (Mageau & Vallerand, 2003), and as further studies empirically support their effects, they can be integrated into existing coach training curricula, or new programs can be designed specifically to emphasize these coach behaviors.

Several limitations of our study should be noted. First the sample was relatively small and, although it was representative of the community population from which it was drawn, it was also homogeneous with regard to ethnicity and socioeconomic status. The single-sport design, while providing some advantages, also created a more homogeneous group. These study design issues limit our ability to generalize our findings to other communities and sport contexts. The relatively small sample size also limited our power to detect small effects, leaving us vulnerable to omitting important relations among these variables. Extending this work to include a larger and more diverse sample would be useful. The study also relied on youth self-report as a measurement strategy. Although direct observation is one technique that has been used to study coach behavior (Smith, Smoll, & Hunt, 1977), our focus in the present study was youth perceptions of autonomy support, rather than actual coach behaviors, because our theoretical model of youth sport development emphasizes how youth perceive their coaches' behavior. Also, this study was not able to account for alternative contexts that might contribute to these developmental processes. Family factors, specifically parent's autonomy supportive behaviors around the context of swimming could also influence youth outcomes. Finally, we focused on one process in the youth sport environment. Other coach-related, peer-related, or intrapersonal processes could also be implicated in positive youth development through sport. Future studies designed to test alternative models against each other would provide a valuable service to the field.

In conclusion, findings from this study contribute to a growing literature on the effects of sport on youth outcomes (Brunelle, Danish, & Forneris, 2007; Larson et al., 2006). More specifically, it adds to accumulating evidence that coach behaviors establish an important context for youth experiences within sport that can have significant developmental effects (Smoll & Smith, 2002). Our findings indicate that autonomy-supportive behaviors may be an important aspect of coaching because of their potential to start important processes into motion that culminate in distal positive youth outcomes. They also suggest that coach training programs that are intended to promote positive youth outcomes might benefit from focusing on these kinds of coach behaviors. Changing athletes self-perceptions appears to be one important mechanism by which the coaching climate may have a distal effect on youth development. This finding may be particularly meaningful, because changes to the self system, in comparison to more context-specific skills or motivation, are likely to be enduring and have a broader effect across developmental domains.

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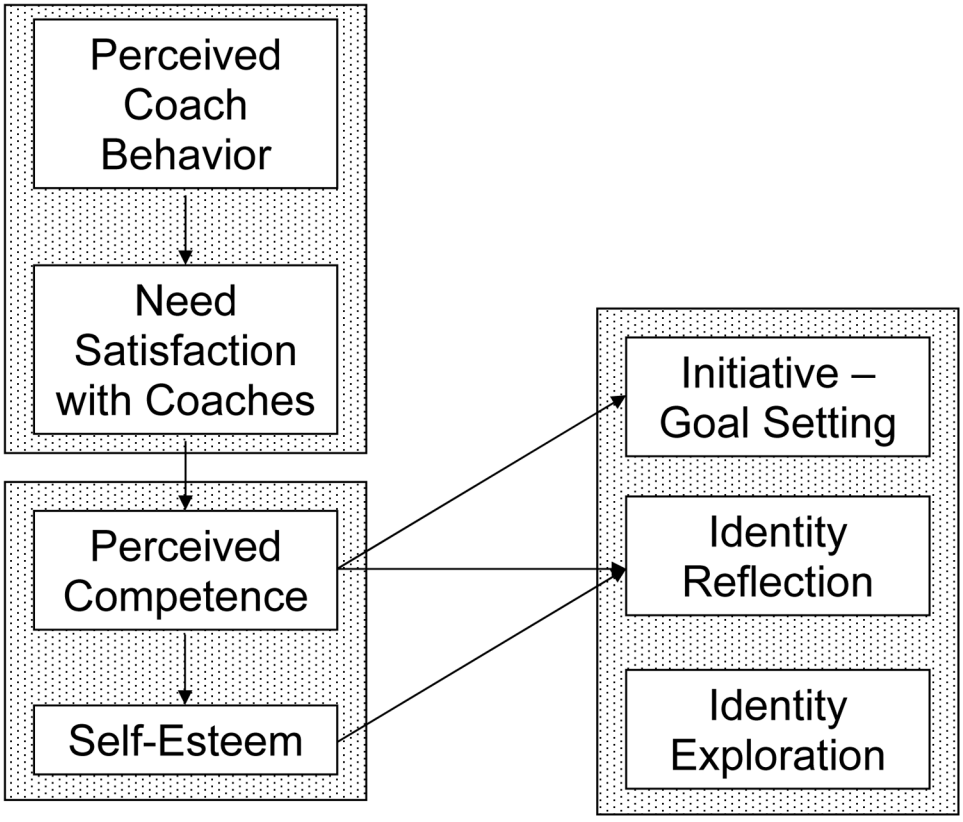

Figure 1.
Conceptual process model depicting the sequential effects of coaching on youth development in organized sports.

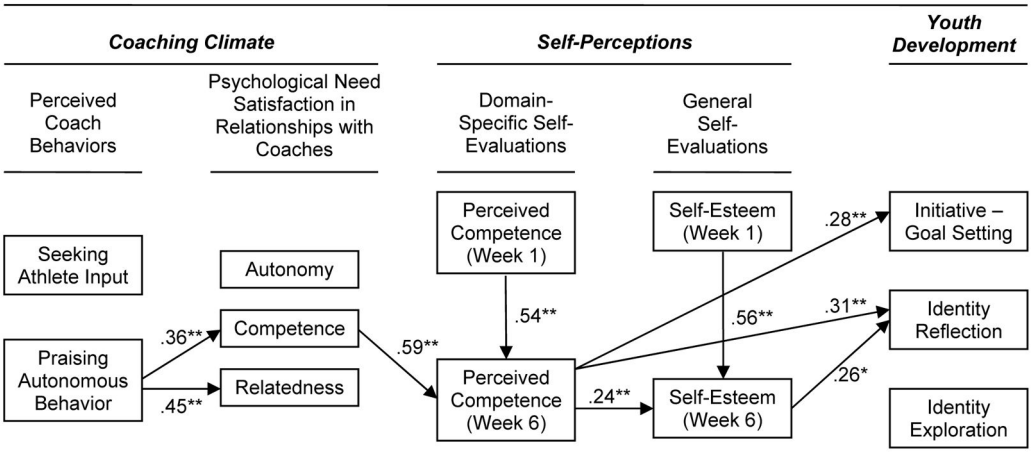

Figure 2.

Structural model of relations between the coaching climate, self-perceptions, and youth development. Paths that did not achieve statistical significance were omitted from the figure for presentational clarity (see the Results section for details on these paths).

Table 1

Means, Standard Deviations and Correlations Among Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Sex	1.00														
2. Age	.03	1.00													
3. Perceived Coach Involvement	−.02	.29*	1.00												
Coaches' Autonomy-Supportive Behavior															
4. Interest	−.02	.11	.20	1.00											
5. Praise	−.02	−.01	.17	.43**	1.00										
Need Satisfaction in Relationships with Coaches															
6. Autonomy	−.16	.03	−.12	.22*	.20	1.00									
7. Competence	−.17	.05	.14	.24*	.41**	.78**	1.00								
8. Relatedness	−.12	−.02	−.01	.27**	.48**	.70**	.80**	1.00							
Perceived Competence															
9. Week 1	.02	−.01	−.11	−.05	.15	.25*	.30**	.37**	1.00						
10. Week 6	.00	−.03	−.03	.09	.22*	.39**	.57**	.48**	.62**	1.00					
Self-Esteem															
11. Week 1	.04	−.06	.17	.14	.12	.28**	.42**	.30**	.53**	.55**	1.00				
12. Week 6	.03	−.15	.13	.14	.12	.24*	.39**	.32**	.46**	.54**	.68**	1.00			
Youth Development Outcomes															
13. Initiative	−.09	.09	.09	.20	.34**	.42**	.45**	.40**	.23*	.37**	.25*	.28**	1.00		
14. Identity Reflection	.00	.07	−.01	.21	.30**	.23*	.42**	.40**	.38**	.47**	.42**	.43**	.59**	1.00	
15. Identity Exploration	.16	−.01	.07	−.07	.14	.05	.11	.13	.01	.09	.07	.17	.13	.27**	1.00
M	n/a	12.07	2.24	3.91	4.30	5.13	5.10	4.55	5.51	5.64	3.31	3.48	3.11	2.73	2.81
SD	n/a	1.79	1.80	1.31	1.58	1.43	1.48	1.61	0.96	0.95	0.60	0.58	0.75	0.88	0.71
α	n/a	n/a	.83	.90	.89	.83	.84	.83	.77	.71	.87	.90	.80	.84	.55

Note:

* $p < .05$;

** $p < .01$