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Assessing autonomy-supportive coaching strategies in youth sport

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Abstract

Objectives: Autonomy support is a component of the motivational climate in youth sport that may promote youth's internalization of behaviors and attitudes. This study examined the psychometric properties of the Autonomy-Supportive Coaching Questionnaire (ASCQ), a measure of two forms of autonomy-supportive coaching perceived by young athletes.
Design: The study design was non-experimental.
Methods: Over a 6-week season, youth ($N = 165$) participating in a recreational summer swim league completed measures of perceived coaching behavior (weeks 1 and 5), autonomy-supportive coaching (week 5) and psychological need satisfaction (weeks 1 and 6).
Results: Responses to the ASCQ could be reduced to two correlated factors representing an "interest in athlete's input" and "praise for autonomous behavior." These factors exhibited slightly different relations with perceived coaching behaviors and positively predicted coaching-associated contrasts in the satisfaction of all three basic psychological needs.
Conclusions: The ASCQ appears to provide a valid assessment of young athlete's perceptions of autonomy-supportive coaching. Autonomy-supportive coaching should be evaluated as a potential source of motivational consequences of coaching and as a potential moderator of coaching effects on youth internalization.

Keywords: Self-determination; Motivational climate; Praise

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Introduction

Coaches can play an important role in youth sport experiences because their behaviors, standards, and goals contribute to the motivational climate and to the developmental benefits attained by participating youth. Organized sport is promoted as an enjoyable and available mode of physical activity for youth with well-established physical health benefits (e.g., reduced risk for or progress of diabetes, cardiovascular disease, obesity, some forms of cancer; American College of Sports Medicine, 2000; Ebbeling, Pawlak, & Ludwig, 2002; USDHHS, 1996). The psychosocial benefits of organized sport participation have received far less systematic scientific attention (for reviews, see Conroy & Coatsworth, 2006; Petitpas, Cornelius, Van Raalte, & Jones, 2005); however, anecdotal evidence abounds of important life lessons learned and developmental experiences acquired through youth sport. Given the important role that youth sport coaches play in shaping the motivational climate and consequences of organized sport experiences for youth, experimental coach training studies have been used to elaborate the qualities of youth sport systems that promote social-emotional development (Conroy & Coatsworth, 2006; Smoll & Smith, 2002).

This study focuses on approaches to coaching that support athletes' autonomy, a component of the motivational climate deriving from self-determination theory (Ryan & Deci, 2002) that has yet to receive attention in experimental coach training research. Autonomy support may be a significant addition to the coach training literature because it is amenable to direct influence by coaches and may have both direct and indirect effects on motivation and youth development through sport.

Self-determination theory and its applications in sport and exercise settings have been reviewed thoroughly elsewhere (Hagger & Chatzisarantis, in press; Ryan & Deci, 2002) and will not be reviewed in detail here. Instead, one construct from this theory, autonomy support, will be highlighted for its potential to inform and enhance coach training programs. Autonomy support can be construed as part of the motivational climate in which activities take place. The functional significance of autonomy-supportive climates is that individuals feel that their behavior originates from and expresses their true selves as opposed to being a response to external pressures or demands (i.e., controlled; Deci & Ryan, 1987). In contrast to controlling climates, autonomy support has been associated with high levels of intrinsic motivation, creativity, cognitive flexibility, conceptual learning, persistence in behavior change, self-esteem, perceived competence, trust, and health (Deci & Ryan, 1987).

The benefits of autonomy support also have been demonstrated in the physical domain. For example, in *physical education classes*, autonomy support has been positively linked with psychological need satisfaction, self-determined motivation (i.e., relative autonomy) for physical activity in physical education and leisure-time activities, physical activity intentions, leisure-time physical activity behavior, teacher ratings of motivated behavior, and concentration, and negatively linked with negative affect (Hagger, Chatzisarantis, Barkoukis, Wang, & Baranowski, 2005; Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003; Ntoumanis, 2005; Standage, Duda, & Ntoumanis, 2005, 2006). Autonomy support also increases the strength of relations between physical education teachers' early expectations and students' later perceptions of competence (Trouilloud, Sarrazin, Bressoux, & Bois, 2006). In *exercise*, autonomy support has been positively linked to self-determined motivation, exercise intentions, effort expenditure, persistence, and

enrollment in a physical activity club (Brickell, Chatzisarantis, & Pretty, 2006; Vansteenkiste, Simons, Soenens, & Lens, 2004; Wilson & Rodgers, 2004). In *organized sports*, autonomy support has been positively linked to basic psychological need satisfaction, self-determined motivation, persistence, changes in subjective vitality, and negatively associated with amotivation and physical symptoms (Gagné, Ryan, & Bargmann, 2003; Pelletier, Fortier, Vallerand, & Brière, 2001; Reinboth & Duda, 2006; Reinboth, Duda, & Ntoumanis, 2004). Autonomy support appears to be an important and desirable component of the motivational climate in physical activity settings.

Unfortunately, the very nature of organized sport lends itself toward a controlling climate. Task-contingent rewards are prevalent. Training and competitions are scheduled in advance to create inflexible "deadlines" for training and performance. Athletes are continually being observed and evaluated by interested parties (e.g., coaches, parents, peers). Athletes' choice is generally limited, particularly in youth sport, given that coaches usually take responsibility for planning training programs and developing competitive strategies. These contextual characteristics can be construed as controlling and, as such, may be antithetical to autonomy support (Deci & Ryan, 1987).

Despite these contextual characteristics, coaches can take steps to create relatively autonomy-supportive climates for athletes by the way they structure the activity and the nature of their interpersonal behaviors with athletes. Mageau and Vallerand (2003) proposed that coaches can support athletes' autonomy by (a) providing choices within limits, (b) offering rationales for activity structures, (c) recognizing athletes' feelings and perspectives, (d) creating opportunities for athletes to demonstrate initiative, (e) providing informational feedback, (f) avoiding overt control and criticism, (g) structuring reward systems thoughtfully, and (h) limiting athletes' ego-involvement in the activity. Other autonomy-supportive coaching strategies can also be conceived. For example, coaches who wish to provide opportunities for athletes to express their true selves via their behaviors may benefit from learning about each athlete's conception of who he or she is and wants to be. Developing authentic relationships with athletes should help to engage the athletes' in the activity on their own terms. This process of creating feelings of inclusion, agency, and personal understanding requires considerable interpersonal skill, particularly considering the scripted role that coaches are expected to play.

Previous research has focused on the extent to which athletes feel generally that their autonomy is supported by parents or coaches instead of evaluating the effectiveness of different strategies used to create autonomy-supportive climates. Developing a scientifically validated repertoire of coaching strategies that support autonomy would benefit coaches in the field as well as scientists interested in evaluating the efficacy and mechanisms by which coach training impacts young athletes. Assuming that certain strategies are more effective than others in particular coaching situations, the long-term motivational and developmental consequences of coaching may be amplified by training coaches how to adapt their behavior to best support athletes' autonomy. Extant measures of autonomy support that have been used in sport research cannot distinguish between different strategies that coaches use to support athletes' autonomy.[1] Therefore, a need exists for a measure of autonomy-supportive coaching strategies.

[1] Reeve (2002) raised a similar question in educational research and established specific behaviors used to support autonomy (e.g., being responsive, supportive, flexible and motivating through interest) and linked those behaviors to student outcomes (e.g., enhanced perceptions of self-determination and competence).

This study investigated whether distinct autonomy-supportive coaching strategies in youth sport can be identified empirically. A self-report measure was developed for young athletes' to rate their coaches' use of two strategies that should create an autonomy-supportive climate. These strategies involved coaches demonstrating an interest in athletes' input by soliciting and incorporating their ideas (an intransitive behavioral strategy), and praising athletes for engaging in desirable behaviors without external pressure (a transitive behavioral strategy). These behaviors were not assumed to represent an exclusive universe of autonomy-supportive coaching strategies (for other coaching strategies, see Mageau & Vallerand, 2003); nevertheless, they provided a preliminary test of whether young athletes differentiate autonomy-supportive coaching strategies.

Athletes' ability to distinguish autonomy-support strategies would be evidenced by (a) distinct factor structures in ratings of autonomy-supportive coaching strategies, and (b) differences in relations with theoretical antecedents (e.g., perceived coaching behaviors) of autonomy support. Two factors were expected to represent ratings of coaches' *interest in athlete's input* and *praise for autonomous behavior*. These factors were expected to be strongly correlated because they are distinguishable behavioral means toward a common motivational end (i.e., autonomy support). Both factors were expected to be positively linked with affiliative and supportive coach behaviors and negatively linked with controlling coach behaviors. Interpersonal theory indicates that blame is the opposite of affirmations like praise because it is hostile and controlling whereas praise is friendly and autonomy-granting (Benjamin, 1974); therefore, the strategy of praising desirable behavior was expected to be negatively associated with coaches' use of blame. Both hypothesized autonomy-supportive coaching strategies should lead to similar motivational consequences, namely psychological need satisfaction. In light of previous findings that psychological needs operate "in unison in natural settings" (Gagné et al., 2003, p. 386), these effects may not be specific to autonomy need satisfaction and could generalize across all three psychological needs. Thus, both autonomy support strategies were expected to positively predict athletes' ratings of basic psychological need satisfaction in their relationships with coaches after controlling for baseline levels of corresponding need satisfaction but praise was expected to have stronger associations because it is a transitive behavior that should be more salient to athletes.

Methods

Participants

Participants in this study were 165 youth (66 boys, 99 girls) aged 7–18 years ($M = 11.2$, $SD = 2.2$) who were participating in a recreational summer swimming league (54% participation rate). For 6 weeks, team practices were held five mornings/week and meets were held during two evenings/week.

Instruments

The 9-item Autonomy-Supportive Coaching Questionnaire (ASCQ) was developed to assess two forms of autonomy support: *interest in athletes' input* and *praise for autonomous behavior*.

Participants rate each item on a scale ranging from 1 (*not at all true*) to 7 (*very true*). Psychometric properties of ASCQ scores will be examined in this study.

Youth perceptions of coach behaviors were assessed using two measures. A series of 12 single-item measures of behaviors (Smith, Smoll, & Barnett, 1995; Smith, Smoll, & Curtis, 1979; Smoll, Smith, Barnett, & Everett, 1993) assessed reactive and spontaneous behaviors corresponding to the Coaching Behavior Assessment System (CBAS; Smith, Smoll, & Hunt, 1977): reinforcement, nonreinforcement, encouragement after mistakes, mistake-contingent technical instruction, punishment, punitive technical instruction, ignoring mistakes, keeping control, general technical instruction, general encouragement, organization, and general communication. Participants rated the frequency with which their coach demonstrated the behavior described in each item on a scale ranging from 1 (*never*) to 7 (*almost always*). Little is known about the psychometric properties of scores from this measure and single-item measures tend to have limited reliability so responses were reduced to more reliable composites for this investigation using exploratory factor analysis.

The 12-item Perceptions of Coaches' Interpersonal Behavior Questionnaire (PCIBQ; Conroy & Coatsworth, in press) also was used to assess commonly observed coaching behaviors. Interpersonal theories distinguish behavior along orthogonal axes representing affiliation and interdependence/control (Benjamin, 1974; Kiesler, 1996). PCIBQ items assess three types of coaching behavior: affiliation (6 items; e.g., "The coaches encouraged me"), control (3 items representing moderate affiliation and high control; e.g., "The coaches fully controlled what I could do"), and blame (3 items representing moderately-low affiliation and moderately-high control; e.g., "The coaches put me down for how I did something"). Participants rated each item on a scale ranging from 1 (*not at all true*) to 5 (*very true*). Conroy and Coatsworth (in press) found that these scores possessed high levels of structural validity and internal consistency, demonstrated expected relations with each other based on circumplex logic, and demonstrated expected relations with perceptions of CBAS behaviors.

Baseline satisfaction of autonomy, competence, and relatedness in life was assessed using a modified version of the 21-item Basic Need Satisfaction in General Scale (BNSGS; Gagné, 2003). All of the reverse-scored autonomy and relatedness items and one of the reverse-scored competence items were re-worded to reduce the amount of specific variance associated with the direction of item wording.[2] Participants responded to each item on a Likert-type scale ranging from 1 (*not at all true*) to 7 (*very true*).

The 9-item Basic Need Satisfaction in Relationships Scale (BNSRS; La Guardia, Ryan, Couchman, & Deci, 2000) was adapted to assess the extent to which participants felt that their coaches were satisfying their needs for autonomy, competence, and relatedness in their interactions. Participants rated items on a scale ranging from 1 (*not at all true*) to 7 (*very true*).

Procedures

Data were collected on three occasions during a 6-week youth sport season. At the end of the first week of practice, participants rated their perceptions of their coaches' behavior using the CBAS items and completed the BNSGS to rate their baseline level of psychological need

[2]The two remaining reverse-scored competence items were not reworded and remained reverse-scored because of an administrative oversight. A complete list of the reworded items is available from the first author.

satisfaction in life. In week 5, participants completed the ASCQ, CBAS items, and the PCIBQ. In week 6, participants completed the BNSRS to rate their level of psychological need satisfaction in their relationships with their swim coaches.

Data analysis

The structure of responses to the ASCQ was examined using confirmatory factor analysis with full-information maximum likelihood parameter estimates. Three models were tested: (1) a unidimensional model in which all items loaded on a single factor representing autonomy-supportive coaching, (2) a model with two uncorrelated factors representing coaches' *interest in athlete's input* and *praise for autonomous behavior*, and (3) a model with two correlated factors representing the same constructs identified above. In each model, every item was specified to load on a single factor and one item–factor regression coefficient on each factor was fixed at 1.0 to establish a metric for the factor. Variances were estimated for each uniqueness but no covariances between uniquenesses were estimated. The fit of competing models was evaluated using a combination of absolute and relative fit indices.

To increase the reliability of the single-item measures of CBAS coaching behaviors, item parcels were created by averaging responses to corresponding items from weeks 1 and 5. These item parcels were subjected to an exploratory factor analysis with maximum likelihood estimation and a promax (oblique) rotation.

Hierarchical multiple regressions were used to examine relations between ASCQ scores and third variables (e.g., perceived coach behaviors, need satisfaction). In the first set of regression models, coach behavior scores were entered simultaneously as predictors of each ASCQ score. In the second set of models, a general need satisfaction score (assessed in week 1) was entered in the first step of the model and ASCQ scores were entered in the second step as predictors of the corresponding level of need satisfaction from athletes' relationships with their coaches. Need satisfaction scores were rated on different scales so this model tested whether perceived autonomy-supportive coaching behaviors predicted *contrasts* between need satisfaction in general and need satisfaction with athletes' relationships with their coaches. Given the expected collinearity between predictors in each of these models, structure coefficients were given greater emphasis than standardized regression coefficients when interpreting parameter estimates in these models (Courville & Thompson, 2001; Thompson & Borello, 1985).

Results

Three models of ASCQ responses were tested.[3] The first model had a single factor with paths to all nine items; χ^2 (27) = 255.09, NFI = .68, NNFI = .60, CFI = .70, RMSEA = .23 (90% confidence interval [CI] = .20–.25). The second model had two uncorrelated factors representing coaches' *interest in athlete's input* (5 items) and *praise for autonomous behavior* (4 items); χ^2 (27) = 103.27, NFI = .87, NNFI = .87, CFI = .90, RMSEA = .13 (90% CI = .11–.16). The final model was identical to the previous model but permitted the two factors to correlate; χ^2

[3]The fit of the independence model was χ^2 (36) = 796.85.

Table 1
Parameter estimates for the two-factor model of ASCQ scores

	Item–factor				
	M	SD	Regression coefficient (SE)	Uniqueness (SE)	SMC
Interest in athlete's input					
My coaches offer me choices about what we do in practice.	3.99	1.59	1.00 (—)	1.62 (0.20)**	.36
My coaches ask for the team's opinion about what we should do in practice.	3.84	1.54	1.44 (0.18)**	0.51 (0.09)**	.78
My coaches ask for my opinion about what I want to do in practice.	3.37	1.56	1.46 (0.19)**	0.53 (0.10)**	.78
My coaches listen to what the team thinks we should do in practice.	4.10	1.63	1.31 (0.18)**	1.11 (0.15)**	.58
My coaches listen to what I think I should do in practice.	3.59	1.68	1.35 (0.19)**	1.14 (0.16)**	.59
Praising autonomous behavior					
My coaches praise me for the things that I choose to do in practice.	3.95	1.94	1.00 (—)	1.30 (0.20)**	.65
My coaches praise me for the decisions I make in practice.	3.99	1.89	1.06 (0.09)**	0.81 (0.17)**	.77
My coaches praise me for my attitude during practice.	4.10	1.83	0.94 (0.09)**	1.13 (0.18)**	.66
My coaches praise me for my effort during practice.	4.79	1.76	0.78 (0.09)**	1.59 (0.21)**	.48

Note: $^{**}p < .01$.

(26) = 63.48, NFI = .92, NNFI = .93, CFI = .95, RMSEA = .09 (90% CI = .07–.12). The correlation between factors in this model was .55 ($p < .01$). Table 1 presents item-level descriptive statistics, and key parameter estimates from this model. Squared multiple correlations for the items ranged from .36 to .78.

Table 2 presents descriptive statistics for the remaining measures used in this investigation. Both ASCQ scores exhibited adequate internal consistency. The *competence need satisfaction in life* scale had a low internal consistency but this value approached an acceptable level for research-use when two reverse-keyed items were dropped from the scale.

Exploratory factor analysis of CBAS item parcels revealed two factors that accounted for 48% of response variance and provided the most parsimonious and interpretable data reduction (two factors also corresponded to the elbow in the scree plot). Table 3 presents the pattern and structure matrices for this solution. The factors were interpreted as perceptions that coaches offered *supportive instruction* ($\alpha = .87$) and *punitive control* ($\alpha = .58$), respectively. Factor scores using regression weights from this analysis were saved for use in subsequent analyses. Supportive

Table 2
Descriptive statistics for scale scores

Scale	*M*	SD	Score range		α
			Observed	Possible	
Autonomy-supportive coaching					
Interest in athlete's input	3.75	1.31	1.00–7.00	1.00–7.00	.88
Praising autonomous behavior	4.19	1.59	1.00–7.00	1.00–7.00	.84
Need satisfaction in life					
Autonomy	5.43	1.07	2.14–7.00	1.00–7.00	.84
Competence	5.59	0.85	3.50–7.00	1.00–7.00	.57
Competence (4-items)	5.75	0.97	2.50–7.00	1.00–7.00	.69
Relatedness	6.03	0.81	3.63–7.00	1.00–7.00	.83
Need satisfaction in relationship with coaches					
Autonomy	5.03	1.50	1.33–7.00	1.00–7.00	.84
Competence	5.07	1.45	1.67–7.00	1.00–7.00	.84
Relatedness	4.49	1.64	1.00–7.00	1.00–7.00	.85
Perceived coach interpersonal behavior questionnaire					
Affiliation	3.99	1.00	1.00–5.00	1.00–5.00	.94
Control	2.23	0.91	1.00–5.00	1.00–5.00	.71
Blame	1.46	0.72	1.00–4.00	1.00–5.00	.74

Table 3
Pattern and structure coefficients for CBAS item parcels

	Pattern matrix		Structure matrix	
	Factor 1	Factor 2	Factor 1	Factor 2
Reactive behaviors				
After desirable player behaviors:				
Reinforcement	.77	.02	.76	−.28
Nonreinforcement	−.56	.26	−.66	.48
After mistakes:				
Encouragement	.79	−.05	.81	−.36
Technical instruction	.85	.19	.78	−.15
Punishment	.05	.99	−.34	.97
Punitive technical instruction	.05	.80	−.26	.78
Ignoring mistakes	−.56	.08	−.58	.29
After player misbehaviors:				
Keeping control	−.05	.31	−.17	.33
Spontaneous behaviors				
General technical instruction	.61	.06	.58	−.18
General encouragement	.76	−.09	.79	−.39
Organization	.40	−.15	.46	−.31
General communication	.42	.08	.39	−.09

instruction scores were positively associated with perceptions of coaches' affiliative behavior ($r = .83$, $p < .01$), and negatively associated with perceptions of coaches' control ($r = -.18$, $p < .05$) and blame ($r = -.27$, $p < .01$). Punitive control scores were positively associated with perceptions of coaches' blame ($r = .65$, $p < .01$) and control ($r = .54$, $p < .01$), and negatively associated with perceptions of coaches' affiliative behavior ($r = -.37$, $p < .01$).

Correlations between all scale scores in this investigation can be found in Table 4. The first pair of regression analyses tested relations between five perceptions of coach behaviors and ASCQ scores. Table 5 presents standardized regression and structure coefficients from these two models. *Interest in athletes' input* was predicted by high levels of affiliative behavior, low levels of control, and high levels of supportive instruction; $F[5, 92] = 4.32$, $p < .01$, $R^2 = .19$. *Praise for autonomous behavior* was predicted by high levels of affiliation and supportive instruction, and low levels of punitive control and blame; $F[5, 90] = 10.03$, $p < .01$, $R^2 = .36$.

Finally, the two ASCQ scores were entered as predictors of the contrast between participants' need satisfaction in life and their need satisfaction with their coaches. As seen in Table 6, need satisfaction in life positively predicted corresponding need satisfaction in participants' relationships with their coaches. Neither ASCQ score significantly predicted contrasts in autonomy need satisfaction when entered simultaneously; however, when either strategy was entered independently, each significantly predicted contrasts in autonomy need satisfaction (consistent with interpretation of the structure coefficients; $\beta_{\text{interest}} = 0.18$, $\beta_{\text{praise}} = 0.19$, both $p < .05$). In contrast, perceptions that coaches' praised autonomous behavior positively predicted contrasts in both competence and relatedness need satisfaction ratings, even when entered alongside the interest in

Table 4
Correlation matrix for scale scores

	1	2	3	4	5	6	7	8	9	10	11	12
Autonomy-supportive coaching												
1. Interest in athlete's input	1.00											
2. Praising autonomous behavior	.49**	1.00										
Basic need satisfaction												
3. Autonomy	.13	.09	1.00									
4. Competence (4-items)	.07	.18	.65**	1.00								
5. Relatedness	.19*	.15	.75**	.69**	1.00							
Need satisfaction in relationships with coaches												
6. Autonomy	.24**	.22*	.42**	.29**	.38**	1.00						
7. Competence	.28**	.41**	.44**	.50**	.46**	.75**	1.00					
8. Relatedness	.30**	.43**	.31**	.35**	.34**	.69**	.78**	1.00				
PCIBQ												
9. Affiliation	.38**	.54**	.09	.20*	.13	.30**	.42**	.50**	1.00			
10. Control	−.01	.08	−.19*	−.12	−.29**	−.21*	−.09	−.15	−.11	1.00		
11. Blame	−.02	−.02	−.12	−.11	−.27**	−.22*	−.16	−.11	−.14	.54**	1.00	
CBAS												
12. Supportive instruction	.22*	.52**	.24*	.35**	.34**	.37**	.45**	.54**	.77**	−.24*	−.17	1.00
13. Punitive control	−.02	−.20*	−.02	−.08	−.26**	−.29**	−.26*	−.31**	−.32**	.44**	.60**	−.42**

**$p < .01$, *$p < .05$.

Table 5
Standardized regression and structure coefficients for coaching behaviors predicting two forms of autonomy-supportive coaching

Predictor	Interest in athlete's input		Praising autonomous behavior	
	β	S	β	S
Supportive instruction	−.10	.53**	.23	.89**
Punitive control	.25†	.02	.07	−.33**
Affiliation	.48**	.82**	.41**	.97**
Control	−.21†	−.38**	.03	−.16
Blame	−.05	−.15	−.08	−.21*

Note: †$p<.10$, **$p<.01$.

Table 6
Standardized regression and structure coefficients for autonomy-supportive coaching predicting contrasts in psychological need satisfaction

Predictor	Autonomy		Competence		Relatedness	
	β	S	β	S	β	S
Need satisfaction in life						
Autonomy	.38**	.88**	—	—	—	—
Competence	—	—	.44**	.83**	—	—
Relatedness	—	—	—	—	.26**	.65**
Autonomy support						
Interest in athlete's input	.15	.53**	.17†	.49**	.09	.58**
Praising autonomous behavior	.12	.50**	.24**	.67**	.37**	.86**

Note: †$p<.10$, **$p<.01$.

athlete's input score. The complete autonomy (F [3, 106] = 10.28, $p<.01$, $R^2 = .23$), competence (F [3, 101] = 18.91, $p<.01$, $R^2 = .36$), and relatedness (F [3, 107] = 14.65, $p<.01$, $R^2 = .29$) need contrast models were all statistically significant.

Discussion

This investigation examined whether young athletes differentiate between strategies that coaches use to support athletes' autonomy in organized sports. Results of a confirmatory factor analysis indicated that youth could differentiate between strategies used by coaches to support autonomy and that these strategies were, as expected, strongly positively correlated. Although both strategies for supporting autonomy that were examined shared a basis in affiliative, supportive, and non-controlling coach behavior, they differed in one key respect. Coaches' interest in athlete's input was unassociated with perceived blame and punitive control whereas coaches' praise for autonomous behavior was negatively associated with perceived blame and punitive control.

An interesting difference emerged in the amount of variance shared between perceived coaching behaviors and the two autonomy-support strategies assessed by the ASCQ. The coaching behaviors sampled here exclusively focused on the athlete and accounted for substantially more variance in the praise strategy than in the demonstrating interest strategy. It may be necessary to sample coaches' intransitive behaviors (i.e., those focused on the self in relation to another person; Benjamin, 1974) to strengthen links between coaching behaviors and the demonstrating interest strategy. For example, intransitive behaviors such as *trusting* athletes or *disclosing* that you are interested in understanding their views may be more likely to be linked with the strategy of demonstrating interest.

Young athletes' baseline satisfaction of psychological needs for autonomy, competence, and relatedness were contrasted with the degree to which they felt that coaches satisfied those needs in their relationship. Both autonomy-support strategies positively predicted contrasts in the satisfaction of all three psychological needs. This finding coincides with previous indications that differentiated psychological need satisfaction processes are difficult to identify outside of controlled laboratory settings (Gagné et al., 2003; Standage et al., 2006). It was interesting to note that, whereas the two strategies appeared to account for similar variance in autonomy need satisfaction, the praise-related strategy was a stronger predictor of both competence and relatedness need satisfaction than was the demonstrating interest strategy. Relatedness needs may be especially responsive to the friendly coaching behaviors involved in delivering praise. The salience of competence in youth sport also may lead youth to interpret affirming feedback with regard to its implications for their competence perceptions. In contrast, autonomy needs appear to be equally satisfied by both strategies.

Although the present research focused on two specific strategies, there are undoubtedly many others that can be identified to characterize the specific behaviors that coaches use to support athletes' autonomy (e.g., Mageau & Vallerand, 2003). These behaviors will undoubtedly predict many similar outcomes (e.g., psychological need satisfaction) but they may also produce unique consequences. For example, hostile control appears to play a central role in the socialization of fear of failure (Conroy & Coatsworth, in press) so autonomy-support produced by praising autonomous behavior may be more effective at reducing fear of failure than would autonomy-support produced by demonstrating an interest in athletes' input. Likewise, demonstrating interest in athletes' input may contribute more to identity development that would praising their autonomous behavior. Future research on the common and unique outcomes associated with different autonomy-support strategies will be valuable for clarifying key components of motivational climates and developing more specific theories of coaching effects on youth development. Results would also help to focus training programs for coaches in a way that would optimize desired effects on youth.

In addition to direct effects of autonomy-support strategies, it is possible that these strategies may moderate important developmental processes in youth sport (see also Amorose, in press). Conroy and Coatsworth (2006) proposed that coach training effects on youth are mediated by a process of internalization whereby perceptions of coaching behaviors are transformed into internal self-perceptions that have close links with relevant motivational outcomes. Autonomy support is known to facilitate internalization of behavioral regulations (Ryan & Deci, 2002). It is quite possible that this effect generalizes to other forms of internalization, such as those proposed in the coach training literature, as well. Thus, future coach training research could investigate

autonomy support as a possible moderator of internalization effects, and even include specific autonomy-support strategies in training programs to amplify program effects.

From an applied perspective, this approach to distinguishing autonomy-support strategies helps to operationally define the coaching qualities that characterize autonomy-supportive motivational climates. Similar work in education has led to autonomy-support training programs that produced sustained change in use of autonomy-supportive teaching styles (Reeve, 1998, 2002). It is worth noting that the ASCQ focused on coaching that occurs during practices—different strategies may support autonomy during competitions. As the domain of autonomy-support strategies in youth sport coaching is formally defined, coach training programs can be developed (or revised) to focus on the most effective behavioral strategies for supporting athletes' autonomy and enhancing motivation.

In conclusion, the present study demonstrated that young athletes can distinguish between strategies used to create an autonomy-supportive motivational climate and that the ASCQ assessed two behaviors that coaches used to support athletes' autonomy. Messick (1995) noted that validity is a property of score interpretations that emerges as empirical evidence accumulates over time. The findings presented here provide sufficient evidence to justify continued use and evaluation of the meaning of ASCQ scores in samples of young athletes. In a broader context, coaches have a leadership role in youth sport that uniquely positions them to support young athletes' autonomy. Developing a catalog of coaching strategies that can be used to support autonomy and documenting the shared and unique consequences of these strategies will provide valuable information for enhancing youth social development that occurs in organized sports.

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