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Athletes' Motivation Regulations and Need Satisfaction Across Combinations of Perceived Coaching Behaviors

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Cluster analysis was used to identify combinations of perceived coaching behaviors (i.e., autonomy support and four controlling coaching behaviors). Motivation regulations and need satisfaction were tested for differences across profiles. Results revealed 3 profiles of college swimmers ($N = 165$) based on their responses to measures of study variables. The profiles had relatively more autonomy support or more controlling coaching behaviors or a combination of the 2. The profile with greater autonomy support and lower controlling coaching behaviors reported the most positive motivation experiences. Findings illustrate the independence of these coaching behaviors and offer practical suggestions for college swim coaches.

Many of the factors that influence athletes' motivation originate with the coach. Coaches can influence athletes' motivation and ultimately their performance in practices or games by providing instruction and positive feedback, praising and providing them with choices, or by intimidating, criticizing and otherwise controlling them (Amorose, 2007). These various strategies coaches use in an attempt to motivate their athletes vary considerably in terms of the role they can play in the quality of athletes' sport experience and performance (Mageau & Vallerand, 2003). The impact of specific coaching behaviors on athletes' motivation is perhaps best exemplified by the theoretical tenets of self-determination theory (SDT; Deci & Ryan, 1985).

SDT (Deci & Ryan, 1985; Ryan & Deci, 2002, 2007) conceptualizes motivation as the different reasons why people engage in different behaviors. These reasons or motivation regulations lie along a continuum ranging from non-self-determined (or controlling) to self-determined (or autonomous). The only completely autonomous form of motivation on the self-determination continuum is intrinsic motivation (i.e., voluntarily engaging in sport for enjoyment, pleasure, fun and/or satisfaction). On the other hand, extrinsic motivation includes reasons for engaging in sport that fall outside of the inherent rewards of sport participation. These reasons range in their degree of self-determination or the extent to which they have been internalized by the athlete. The most autonomous type of extrinsic motivation is integrated regulation, where individuals engage in their sport because it is part of their identity or sense

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of self. The next type of extrinsic motivation, though still autonomous, is identified regulation where individuals play their sport because they view it as important and valued.

The next two forms of extrinsic motivation are controlling in nature. First is introjected regulation where individuals perform in order to avoid guilt or anxiety, gain social approval or enhance their ego. External regulation is the most controlling form of extrinsic motivation where individuals engage in sport to satisfy external demands such as playing for a reward or to avoid being punished. Finally, amotivation is considered a nonregulation and reflects participation in sport without having any interest or desire (Ryan & Deci, 2002; Standage & Ryan, 2012). In line with SDT research (Ryan & Deci, 2002, 2007), athletes will exhibit more positive outcomes such as positive emotions, satisfaction, effort, and persistence when they experience more autonomous forms of motivation compared to more controlling forms of motivation (Blanchard, Amoit, Perreault, Vallerand, & Provencher, 2009; Pelletier, Fortier, Vallerand, & Brière, 2001; Pelletier et al., 1995).

Based on SDT (Deci & Ryan, 1985), autonomous forms of motivation can be facilitated by the three basic psychological needs for autonomy (i.e., engaging in sport as a result of your own volition), competence (i.e., feeling skilled at one's sport), and relatedness (i.e., feeling socially connected to others; Deci & Ryan, 1985; Ryan & Deci, 2002, 2007). According to SDT, individuals will be drawn to engage in activities that fulfill these three basic psychological needs. In turn, greater satisfaction of the three basic psychological needs will result in more autonomous motivation (i.e., intrinsic motivation, integrated regulation, or identified regulation), whereas thwarting of the basic needs will result in more controlling forms of motivation (e.g., introjected or external regulations; Ryan & Deci, 2002). Researchers have supported positive relationships between satisfaction of the three basic psychological needs and autonomous forms of motivation in the sport setting (e.g., Amorose & Anderson-Butcher, 2007; Jösaar, Hein, & Hagger, 2011; Sarrazin, Vallerand, Gillet, Pelletier, & Cury, 2002).

SDT (Ryan & Deci, 2002) explains that coaching behaviors influence athletes' motivation through their direct impact on the satisfaction of athletes' three basic psychological needs. Coaches have the ability to reward athletes for desirable behaviors, provide different types of feedback after successes or failures or emphasize different definitions of success, (e.g., mastery or performance climate; Amorose, 2007). Athletes' perceptions of these coaching behaviors have all demonstrated significant relationships with the satisfaction of one or more of the psychological need variables (e.g., Black & Weiss, 1992; Sarrazin et al., 2002). Although each of these coaching behaviors has the potential to impact athletes' motivation, recent sport studies imply that the interpersonal style of coaches may be particularly relevant to athletes' need satisfaction and, indirectly, motivation regulations (Ntoumanis, 2012). In line with SDT, coaching interpersonal styles can be conceptualized as autonomy-supportive and/or controlling.

Autonomy-supportive coaches provide opportunities for their athletes to make choices, feel volitional, and self-regulate their behavior (Deci & Ryan, 1985). A considerable amount of research in sport has revealed that athletes' perceptions of autonomy-supportive coaching is related to greater perceptions of autonomy, competence, and relatedness, and more autonomous forms of motivation (e.g., Adie, Duda, & Ntoumanis, 2008, 2012; Amorose & Anderson-Butcher, 2007; Gagné, Ryan, & Bargmann, 2003; Hodge & Lonsdale, 2011; Pelletier et al., 2001). For example, Adie et al.'s (2012) longitudinal study with elite youth soccer players in the United Kingdom revealed that perceptions of coaches' autonomy-supportive behavior positively predicted within-person change and between-person mean differences in basic need satisfaction over time. Furthermore, Pelletier et al.'s (2001) study examining Canadian competitive swimmers ages 13 to 22 longitudinally supported a positive relationship between perceived autonomy-supportive coaching behavior and intrinsic motivation, identified

regulation and introjected regulation. Although SDT proposes that autonomy-supportive behavior is negatively related to controlling forms of motivation such as introjected regulation, this study implies the opposite can occur. Furthermore, perceived autonomy-supportive coaching behavior negatively related to amotivation and was not significantly related to external regulation. In summary, researchers have revealed that perceptions of autonomy-supportive coaching behavior relates positively to satisfaction of the three basic psychological needs, autonomous forms of motivation, and introjection in sport.

The majority of SDT-based coaching behavior research has been focused on how need satisfaction and autonomous forms of motivation can be supported, but more recently the focus has shifted to behaviors that may impede or undermine need satisfaction. Although autonomy-supportive coaching behavior has been found to be beneficial for athletes' need satisfaction and autonomous motivation, many coaches engage in behaviors that have the opposite effect on athletes (Ntoumanis, 2012). These are referred to as controlling coaching behaviors where coaches act in authoritarian and pressuring ways (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009). Pelletier et al. (2001) examined the extent to which athletes perceived their coach as controlling (i.e., engaging in coercive behaviors) and found positive associations with introjected regulation, external regulation, and amotivation in competitive age-group swimmers.

More recently, controlling coaching behavior has been measured using the Controlling Coach Behaviors Scale (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010), which describes four distinct coaching strategies (i.e., controlling use of rewards, negative conditional regard, intimidation, and excessive personal control) that may undermine athletes' feelings of autonomy, competence, and relatedness and, thus, decrease autonomous motivation (Bartholomew et al., 2009). Controlling use of rewards is a strategy where extrinsic rewards are used to control behavior, negative conditional regards refers to the withholding of love or attention by coaches when desired behaviors are not met by athletes, intimidation involves strategies designed to humiliate and belittle (e.g., yelling, threats), and excessive personal control involves interfering with athletes' lives outside of sport (Bartholomew et al., 2010). Initial research utilizing this measure implies that controlling coaching behaviors may undermine autonomous motivation and promote more controlling motivation because they fail to support satisfaction of the three basic psychological needs (Bartholomew, Ntoumanis, Ryan, Bosch, & Thøgersen-Ntoumani, 2011). For example, Bartholomew et al. (2011) revealed that higher perceptions of controlling coaching behavior associate with lower perceptions of the three basic psychological needs. However, very little research has used the Controlling Coach Behaviors Scale to examine how the four distinct controlling coaching behaviors relate to both need satisfaction and motivation regulations, instead favoring a composite variable of controlling coaching behavior.

Although we now have an abundance of research supporting the more adaptive role of autonomy-supportive coaching behaviors and emerging research on the more negative role that controlling coaching behaviors can play in athletes' motivational experiences, there is no research testing how different combinations of perceived autonomy-supportive and four distinct controlling coaching behaviors (i.e., controlling use of rewards, negative conditional regard, intimidation, and excessive personal control) may associate with athletes' need satisfaction and motivation regulations. For example, coaches may use some combination of autonomy-supportive and controlling behaviors to motivate their athletes. The physical education and parenting literatures imply that autonomy support and psychological control can be independent of each other or may co-occur (Silk, Morris, Kanaya, & Steinberg, 2003; Tessier, Sarrazin, & Ntoumanis, 2008). For example, early research found that autonomy support and psychological control lie on the opposite ends of a single continuum (Schaefer, 1965). Later

research implied that autonomy support and psychological control have a quasi-orthogonal relationship meaning that the two are distinct constructs where failure to internalize motivation may be more related to the presence of psychological control than to the absence of autonomy support (Silk et al., 2003). More recent research explains autonomy support as two-dimensional including the promotion of independence and promotion of volitional functioning (Soenens et al., 2007). Within this conceptualization, the promotion of independence is relatively orthogonal to psychological control, whereas the promotion of volitional functioning is quite incompatible with psychological control (Soenens et al., 2007; Soenens, Vansteenkiste, & Sierens, 2009). Thus, there is considerable debate concerning the relationship between autonomy-supportive and controlling behaviors. Yet no research currently exists to shed light on the potential for these distinct behaviors to coexist in the sport domain.

Thus, the purpose of this study was to (a) use a person-centered approach to explore to what extent athletes perceived different combinations of autonomy-supportive and four distinct types of controlling coaching behaviors and (b) examine how different combinations of perceived autonomy-supportive and four types of controlling coaching behaviors differ with respect to need satisfaction variables and motivation regulations. Specifically, we used cluster analysis to identify unique combinations or profiles of coaching behaviors that college athletes experience based on autonomy support and four distinct controlling coaching behaviors (i.e., controlling use of rewards, negative conditional regard, intimidation, and excessive personal control; Bartholomew et al., 2010). Given the current debate on the relative independence of these behaviors, no specific hypotheses were forwarded concerning what profiles might emerge. Furthermore, the profiles that emerged were tested for differences in need satisfaction variables and motivation regulations. Profiles characterized by greater perceived autonomy support were expected to have higher perceived competence, autonomy, and relatedness and autonomous forms of motivation and lower controlling forms of motivation compared to profiles characterized by lower perceived autonomy support regardless of how strong the controlling coaching behaviors were that they experienced. This hypothesis is in line with research findings illustrating that having combinations of autonomous and controlling motivation regulations associates with similarly positive affective and behavioral outcomes relative to having higher autonomous motivation and lower controlling motivation (Ullrich-French & Cox, 2009).

METHOD

Participants

The participants ($N = 165$) were male ($n = 71$) and female ($n = 94$) student athletes from eight NCAA Division I swim teams competing in seven different conferences across the Midwest, Mid-Atlantic, and Northeast regions of the United States. These athletes were participants in a larger study that investigated the effects of scholarship status on motivational outcomes (Matosic, Cox, & Amorose, 2014).¹ Four teams were coed, two teams were male and female with different coaches, and two teams were women only. All participants reported their head coaches were male. Student athletes ranged in age from 18 to 22 years old ($M_{\text{age}} = 20.06$, $SD = 1.21$) including 24.2% freshmen, 25.5% sophomores, 32.1% juniors, 14.5% seniors, 1.8% grad students, and 0.6% other; 1.2% did not report their class. The participants reported swimming for an average of 11.58 years ($SD = 3.62$), with an average of 2.41 years ($SD = 1.10$) swimming on their current team and an average of 2.38 years ($SD = 1.52$) being coached by their current coach. Most of the swimmers (78.7%) reported receiving some amount of athletic scholarship. Scholarship status was measured on a scale ranging from no

scholarship (0%), to four levels of partial scholarship (1–25%, 25–50%, 50–75%, 75–99%), to full scholarship (100%; see footnote 1). The majority of student athletes identified themselves as White/Caucasian (85.5%). Other races reported were Black (2.4%), Latino/Hispanic (2.4%), Asian (3.6%), bi- or multiracial (1.8%), and other (2.4%); 1.8% did not report their race.

Measures

Perceived autonomy

Perceived autonomy was assessed by Hollembeak and Amorose's (2005) six-item scale measuring the amount of choice or control athletes feel they have in their sport participation (e.g., "I help decide what I do when participating in my sport"). Responses were scored on a 5-point scale ranging from 1 (*not at all true for me*) to 5 (*completely true for me*). This scale has demonstrated construct validity and adequate internal consistency reliability ($\alpha > 0.70$) in previous studies with college athletes (e.g., Amorose & Anderson-Butcher, 2007).

Perceived competence

A modified version of the five-item perceived competence subscale of the Intrinsic Motivation Inventory (McAuley, Duncan, & Tammen, 1989) was used to measure perceived competence. The items were modified from *activity* and *at this game* to *my sport* and *during competition* (e.g., "I am pretty skilled at my sport"). Two of the items were changed from past tense to present tense (e.g., "After competing, I feel pretty competent at my sport"). Responses were scored on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). A modified version of this subscale has demonstrated construct validity and adequate internal consistency reliability ($\alpha > 0.70$) in previous research studies in sport settings (Amorose & Horn, 2000; Bartholomew et al., 2011).

Perceived relatedness

Perceived relatedness was assessed using a modified version of Richer and Vallerand's (1998) Feelings of Relatedness Scale. The five-item acceptance subscale (e.g., "In my relationships with the members of my sport team I feel supported.") was used with responses ranging on a 7-point scale from 1 (*do not agree*) to 7 (*very strongly agree*). A modified version of this subscale has demonstrated construct validity and adequate internal consistency reliability ($\alpha > 0.70$) in previous sport-related research studies (e.g., Hollembeak & Amorose, 2005; Reinboth, Duda, & Ntoumanis, 2004).

Motivation regulations

The Behavioral Regulation in Sport Questionnaire (Lonsdale, Hodge, & Rose, 2008) was used to measure athletes' motivation. The subscales (four items each) included intrinsic motivation-general (e.g., "I participate in my sport because I enjoy it"), integrated regulation (e.g., "I participate in my sport because it's part of who I am"), identified regulation (e.g., "I participate in my sport because I value the benefits of my sport"), introjected regulation (e.g., "I participate in my sport because I would feel ashamed if I quit"), external regulation (e.g., "I participate in my sport because people push me to play"), and amotivation (e.g., "I participate in my sport but I wonder what's the point"). The responses ranging on a 7-point scale from 1 (*not true at all*) to 7 (*very true*). The Behavioral Regulation in Sport Questionnaire has demonstrated construct validity and adequate internal consistency reliability ($\alpha > 0.70$) in previous sport-related research studies (Hodge & Lonsdale, 2011; Lonsdale et al., 2008).

Autonomy-supportive behavior

Perceived autonomy-supportive coaching behavior was assessed using a 15-item Sport Climate Questionnaire (SCQ; e.g., “I feel that my coach provides me choices and options.”). Responses ranging on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The SCQ is a modified version of the Health Care Climate Questionnaire (Williams, Grow, Freedman, Ryan, & Deci, 1996) and describes the degree to which athletes perceive their coach as autonomy-supportive. The SCQ has demonstrated construct validity and adequate internal consistency reliability ($\alpha > 0.70$) in previous sport-related research studies (e.g., Amorose & Anderson-Butcher, 2007).

Controlling coaching behavior

Controlling coaching behavior was assessed by the 15-item Controlling Coach Behaviors Scale (Bartholomew et al., 2010). The scale is divided into four subscales: controlling use of rewards (e.g., “My coach tries to motivate me by promising to reward me if I do well”), negative conditional regard (e.g., “My coach pays me less attention if I have displeased him/her”), intimidation (e.g., “My coach shouts at me in front of others to make me do certain things”), and excessive personal control (e.g., “My coach tries to control what I do during free time.”). The responses ranged on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). These items have demonstrated construct validity and adequate internal consistency reliability ($\alpha > 0.70$) in the sport setting (Bartholomew et al., 2011; Bartholomew et al., 2010). Each of the distinct controlling coaching behavior subscales was used separately in analyses.

Procedures

After gaining approval from the institutional review board, 20 head coaches from NCAA Division I swim teams in the Midwest, Mid-Atlantic, and Northeast regions of the United States were contacted first via e-mail or phone by one of the investigators requesting permission to invite their athletes to participate in this study. The three regions were selected based on the first author's access and available resources. Upon getting a positive response from eight head coaches, dates and times to meet with the athletes were arranged. The meeting took place in the swimming pool area. At this meeting, the purpose and procedures of the study were explained to athletes verbally and in written consent form. Participants were reminded that their participation was completely voluntary and their answers would be confidential. If they agreed to participate, athletes signed a letter of consent before completing the questionnaire. The questionnaire took approximately 15 to 20 min to complete. Coaches were not involved in the administration of the questionnaire.

Data Analyses

Prior to addressing the main purpose of the study, screening for univariate and multivariate normality and outliers, calculating means, standard deviations, scale reliabilities, and correlations was conducted using SPSS 19.0. To identify unique combinations of coaching behaviors that college athletes experienced, cluster analysis was conducted using perceptions of autonomy support and four distinct controlling coaching behaviors (i.e., controlling use of rewards, negative conditional regard, intimidation, and excessive personal control) as the clustering variables. First, scores on the clustering variables were converted to z scores. Then, a hierarchical cluster analysis was conducted on the whole sample using Ward's method and squared Euclidean distance as the similarity measure. This method allowed for identification of an appropriate number of clusters and provided initial cluster centers for each variable. This procedure was repeated without multivariate outliers ($df = 4, p < .001$) to determine their impact on the results. Next, a

k-means cluster analysis was conducted on two randomly selected subsamples of the data using the cluster centers generated from the hierarchical cluster analysis. After specifying the number of clusters, we tested for differences in motivation regulations and need satisfaction variables across the emergent profiles using two multivariate analyses of variance (MANOVAs). Follow-up univariate tests were used in the case of significant overall effects to determine which clusters differed from one another.

RESULTS

Missing Data Analyses

Forty-three variables were missing at least one data point across 36 participants. No variable was missing more than 5% of participant responses. Little's missing completely at random (Tabachnick & Fidell, 2007) test was nonsignificant, $\chi^2(1687) = 1781.65, p > .05$, indicating that there was no significant deviation from a pattern of values that are "missing completely at random." Three cases were deleted due to missing an entire measure or most of a measure. Missing values in the remaining cases ($N = 165$) were imputed using the expectation maximization algorithm. The number of missing values (5% or less) was considered acceptable and not expected to impact the results (Tabachnick & Fidell, 2007).

Preliminary Analyses

Table 1 summarizes the bivariate correlations, internal consistency reliabilities, means, and standard deviations for all study variables. All study variables were internally consistent ($\alpha > .70$) and normally distributed (skewness range = -0.98 to 0.75 ; kurtosis range = -1.03 to 0.83). All coaching behaviors (i.e., autonomy support, controlling use of rewards, negative conditional regard, intimidation and excessive personal control) fell in a moderate range with the means for autonomy-supportive behavior falling above and the controlling behaviors falling below the midpoint of their respective scales. Furthermore, means for perceptions of competence, autonomy and relatedness, intrinsic motivation, integrated regulation, identified regulation, and introjected regulation were above and means for external regulation and amotivation below the midpoint of their scales. Correlation coefficients did not reveal any relationships that might indicate multicollinearity (i.e., $r > .70$). Most bivariate correlations were in anticipated directions and theoretically consistent. Finally, four multivariate outliers were identified ($df = 4, p < .001$) using Mahalanobis distance. The hierarchical cluster analysis was conducted with and without these outliers to determine any meaningful differences in the results. Because the results did not show any differences, all cases remained in the study.

Cluster Analysis

The results of the hierarchical cluster analysis implied three-, four-, and five-cluster solutions as reasonable for this sample based on the agglomeration schedule coefficients. The means for the three-, four-, and five-cluster solutions were calculated and graphed. Graphs were visually inspected to determine which solution provided the most unique information about the variety of athletes' experiences of various coaching behaviors without being too redundant across profiles or clusters. Based on this inspection, it was decided that the three-cluster solution best captured the range of athlete experiences in this sample. Next, a *k*-means cluster analysis was conducted on two randomly selected subsamples of the data using the cluster centers generated from the three-cluster solution from the hierarchical cluster analysis. The results of the hierarchical and *k*-means cluster analyses were consistent with regard to the

Table 1
Summary of Correlations, Internal Consistencies, Means, and Standard Deviations for Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Autonomy support	.95													
2 Controlling use of rewards	-.34**	.81												
3 Negative conditional regard	-.61**	.62**	.89											
4 Intimidation	-.56**	.66**	.68**	.84										
5 Excessive personal control	-.57**	.55**	.64**	.64**	.83									
6 Competence	.27**	-.19*	-.22**	-.31**	-.24**	.82								
7 Autonomy	.47**	-.27**	-.40**	-.45**	-.45**	.28**	.79							
8 Relatedness	.50**	-.20*	-.43**	-.27**	-.42**	.22**	.26**	.93						
9 Intrinsic motivation	.30**	-.21**	-.34**	-.34**	-.47**	.31**	.44**	.30**	.92					
10 Integrated regulation	.29**	-.15*	-.25**	-.26**	-.34**	.20**	.27**	.34**	.62**	.80				
11 Identified regulation	.33**	-.16*	-.28**	-.33**	-.33**	.22**	.21**	.35**	.55**	.58**	.76			
12 Introjected regulation	-.12	.13	.19*	.14	.18*	-.19*	-.21**	-.09	-.26**	.10	.06	.85		
13 External regulation	-.25**	.30**	.28**	.36**	.35**	-.15	-.30**	-.09	-.34**	-.04	-.04	.59**	.89	
14 Amotivation	-.31**	.29**	.36**	.38**	.39**	-.27**	-.30**	-.22**	-.56**	-.20*	-.21**	.56**	.68**	.89
Possible range	1-7	1-7	1-7	1-7	1-7	1-7	1-5	1-7	1-7	1-7	1-7	1-7	1-7	1-7
<i>M</i>	4.74	2.89	3.47	2.65	3.22	5.08	3.20	5.41	5.00	5.68	5.38	4.33	3.20	3.35
<i>SD</i>	1.32	1.29	1.67	1.46	1.59	1.12	0.80	1.33	1.37	1.02	1.12	1.62	1.63	1.63

Note. *N* = 165. Cronbach's alpha coefficients are in bold along the diagonal. Correlation values are below diagonal. All variables are measures of perceptions.

p* < .05. *p* < .01.

Table 2
Participant Numbers, Means, Standard Deviations, and Standardized Scores for Coaching Behavior Profiles

Cluster	<i>n</i>	Autonomy-supportive		Controlling use of rewards		Negative conditional regard		Intimidation		Excessive personal control	
		<i>M (SD)</i>	<i>z</i>	<i>M (SD)</i>	<i>z</i>	<i>M (SD)</i>	<i>z</i>	<i>M (SD)</i>	<i>z</i>	<i>M (SD)</i>	<i>z</i>
Controlled	54	3.35 (0.91)	−1.05	3.69 (0.96)	0.62	5.04 (1.18)	0.94	3.97 (1.37)	0.91	4.62 (1.45)	0.88
Supported	75	5.43 (1.00)	0.52	1.77 (0.69)	−0.87	2.22 (1.12)	−0.75	1.54 (0.64)	−0.76	2.18 (0.89)	−0.66
Supported and controlled by rewards	36	5.38 (0.65)	0.49	4.02 (0.66)	0.88	3.74 (1.00)	0.16	2.98 (0.89)	0.23	3.32 (1.26)	0.06

final cluster centers, further supporting the three-cluster solution profile as our final profile. Table 2 summarizes the means, standard deviations, and *z* scores for each perceived coaching behavior variable across the three clusters that emerged. The clusters are also displayed in Figure 1. Standardized scores of ± 0.5 were used as criteria for interpretation of higher or lower levels of perceived coaching behavior relative to the sample mean. Each profile was given a name based on its athletes' relative scores on the five perceived coaching behaviors.

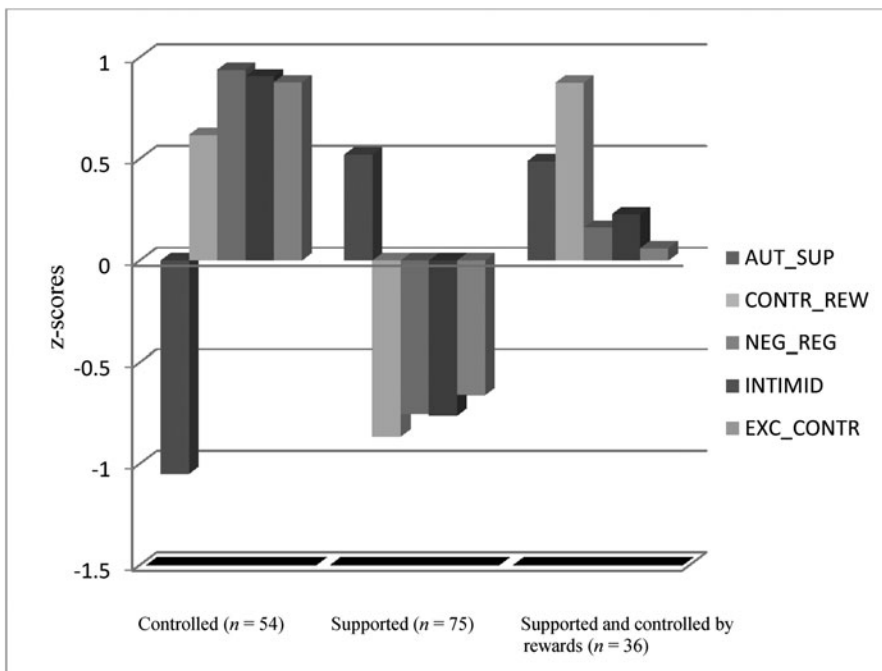


Figure 1. Results of *k*-means cluster analysis (*N* = 165). *Note.* AUT_SUP = autonomy-supportive, CONTR_REW = controlling use of rewards, NEG_REG = negative conditional regard, INTIMID = intimidation, EXC_CONTR = excessive personal control.

The first profile was labeled controlled ($n = 54$) and represented athletes who perceived their coaches as more controlling in terms of controlling use of rewards, negative conditional regard, intimidation, and excessive personal control and lower in autonomy support relative to the sample mean. The second profile was labeled supported ($n = 75$) and included athletes who perceived their coaches as higher on autonomy support and lower on all four controlling coaching behaviors relative to the sample mean. Finally, the third profile was labeled supported and controlled by rewards ($n = 36$) and characterized athletes who perceived their coaches as higher on autonomy support and controlling use of rewards and average on the other three controlling coaching behaviors compared to the sample.

Cluster Differences

Prior to testing for cluster difference on motivation variables, a MANOVA was conducted to test for differences in cluster membership across gender, year in school, and scholarship status. The overall multivariate test was significant, Pillai's Trace = .09, $F(6, 314) = 2.38$, $p = .029$, $\eta_p^2 = .04$. Follow-up univariate tests showed that scholarship status was the only variable that differed significantly across the three clusters. Specifically, controlled athletes reported higher scholarship status compared to supported and supported and controlled by rewards athletes, $F(2, 161) = 6.06$, $p = .003$, $\eta_p^2 = .07$.

The MANOVA with perceived competence, autonomy, and relatedness as dependent variables was significant, Pillai's Trace = .31, $F(6, 322) = 9.75$, $p < .001$, $\eta_p^2 = .15$. Follow-up univariate tests showed that the controlled athletes experienced lower ($p < .01$) need satisfaction compared to the supported athletes and lower autonomy and relatedness compared to the supported and controlled by rewards profile. The MANOVA with motivation regulations as dependent variables was also significant, Pillai's Trace = .21, $F(12, 316) = 3.06$, $p < .001$, $\eta_p^2 = .10$. Follow-up univariate tests showed that the controlled athletes experienced lower ($p < .05$) autonomous forms of motivation (i.e., intrinsic motivation, integrated and identified regulation) and higher controlling forms of motivation (i.e., external regulation and amotivation) compared to supported athletes. Supported and supported and controlled by rewards groups experienced higher identified regulation compared to the controlled group. The supported and supported and controlled by rewards athletes did not differ on any need satisfaction or motivation variables. Table 3 displays the means and effect sizes for all dependent variables across the three perceived coaching behavior profiles.

DISCUSSION

The current study sought to identify distinct combinations of five perceived coaching behaviors (i.e., autonomy support, controlling use of rewards, negative conditional regard, intimidation, and excessive personal control) that college athletes may experience and then determine how athletes' motivational experiences differ across these unique coaching experiences. Three different profiles emerged from a cluster analysis representing athletes who felt controlled, supported, and supported and controlled by rewards. The profiles differed from each other in terms of the relative balance of autonomy-supportive to controlling coaching behaviors. Both similarities and differences existed across the profiles in terms of athletes' psychological need satisfaction and motivation regulations, with the supported profile being the most adaptive and the controlled profile the least adaptive for athletes' sport experiences. These results support the independence of these disparate coaching behaviors and extend the literature on how unique combinations of these coaching behaviors associate with motivational outcomes.

Table 3
Univariate F , Effect Sizes, Profile Means, and Standard Deviations for Motivation Variables

Variable	F	η_p^2	Cluster		
			Controlled ^a	Supported ^b	Supported and controlled by rewards ^c
			$M (SD)$	$M (SD)$	$M (SD)$
Autonomy	17.55**	.18	2.75 (0.70) _a	3.53 (0.72) _b	3.18(0.81) _b
Relatedness	19.71**	.20	4.57 (1.37) _a	5.89 (1.17) _b	5.67(0.99) _b
Competence	4.89**	.06	4.74 (1.13) _a	5.35 (1.33) _b	5.02(0.96) _{a,b}
Intrinsic motivation	8.11**	.09	4.46 (1.37) _a	5.40 (1.27) _b	4.96(1.30) _{a,b}
Integrated regulation	6.38**	.07	4.95 (1.07) _a	5.63 (1.10) _b	5.48(1.08) _{a,b}
Identified regulation	7.89**	.09	5.24 (1.14) _a	5.92 (0.87) _b	5.78(0.91) _b
Introjected regulation	1.73	.02	4.54 (1.75) _b	4.07 (1.57) _b	4.55(1.50) _b
External regulation	9.02**	.10	3.83 (1.62) _a	2.67 (1.55) _b	3.38(1.48) _{a,b}
Amotivation	9.80**	.11	4.00 (1.69) _a	2.79 (1.40) _b	3.52(1.62) _{a,b}

Note. Cluster differences ($p < .05$) based on pairwise comparison of estimated marginal means are indicated by distinct subscripts. $N = 165$.

^a $n = 54$. ^b $n = 75$. ^c $n = 36$.

** $p < .01$.

The supported profile represented athletes who perceived their coaches as highly autonomy-supportive and rather low in their use of controlling behaviors both compared to the sample as a whole and in terms of absolute scores (i.e., means). Supporting our hypothesis, supported athletes experienced the greatest degree of psychological need satisfaction (i.e., perceived autonomy, relatedness, and competence) and autonomous forms of motivation (i.e., intrinsic motivation, integrated and identified regulations) and the lowest scores on external regulation and amotivation. These findings are consistent with previous sport studies examining the role of autonomy-supportive coaching in predicting motivation and need satisfaction. Specifically, this research has shown that athletes who perceive their coaches as more autonomy-supportive will experience greater need satisfaction and autonomous motivation and lower controlling forms of motivation (Amorose & Anderson-Butcher, 2005; Pelletier et al., 2001).

The controlled profile stood in stark contrast to the supported profile. This profile represented athletes who perceived their coaches as more controlling and less autonomy-supportive relative to the sample. Supporting our hypotheses, this group of athletes experienced significantly lower need satisfaction (i.e., autonomy, competence, relatedness) and autonomous forms of motivation (i.e., intrinsic motivation, integrated and identified regulation) and higher controlling forms of motivation (i.e., external regulation) and amotivation compared to supported athletes. Consistent with previous research in sport settings (Bartholomew et al., 2011; Pelletier et al., 2001), athletes who perceive their coaches as controlling experienced lower need satisfaction, lower autonomous forms of motivation, and higher controlling forms of motivation. It should be noted that athletes in this controlled profile perceived levels of autonomy support that fell just below the midpoint of the scale. So, although they experienced moderate levels of autonomy support, it did not seem to be high enough to counteract the effects of the strong controlling coaching behaviors.

Finally, the supported and controlled by rewards profile characterized athletes who perceived their coaches as relatively (i.e., compared to the sample mean) more autonomy-supportive and

more controlling, but only in terms of their use of rewards. The supported and controlled by rewards and supported athletes did not differ on any need satisfaction or motivation regulations. On the other hand, the supported and controlled by rewards did not differ from the controlled profile on competence, intrinsic motivation, integrated and external regulation, and amotivation. Although the supported and controlled by rewards profile did report higher perceived autonomy, relatedness and identified regulation compared to the controlled profile. Collectively, these findings imply that the supported and controlled by rewards profile is just as adaptive as the supported profile yet also has some similarities with the controlled profile. Of interest, the supported and controlled by rewards profile also had moderate levels of the other three controlling coaching behaviors even though these levels were not greater relative to the sample mean (i.e., $z\text{-score} \geq .5$). These findings contribute to the existing literature that has only examined these coaching behaviors in parallel by showing that moderate levels of controlling coaching behavior are motivationally adaptive when paired with high autonomy support (but not moderate autonomy support as in the controlled profile). Thus, experiencing higher autonomy support in combination with controlling coaching behaviors may help protect these athletes in terms of their autonomy, relatedness, and identified regulation. In addition, the combination of both autonomy-supportive and controlling coaching behaviors within the controlled and supported and controlled by rewards profiles imply that these two types of coaching styles are orthogonal or independent supporting the current parenting literature (Soenens et al., 2007; Soenens et al., 2009).

This study also extends the literature on coaching behaviors through the examination of each of the four distinct controlling coaching behaviors individually (i.e., controlling use of rewards, negative conditional regard, intimidation, and excessive personal control) in addition to autonomy support. Cluster analysis results showed that athletes tend to perceive similar levels of negative conditional regard, intimidation, and excessive personal control within profiles. Therefore, the results of this study do not shed light on how these different controlling coaching behaviors may relate uniquely to motivation variables. However, perceptions of the controlling use of rewards were higher than the other controlling coaching behaviors in the supported and controlled by rewards profile and may have contributed to some of the similarities these athletes had with the controlled athletes. For example, in an earlier study that was conducted with this same data set (Matosic et al., 2014), findings implied that coaches may diminish athletes' feelings of competence through their use of rewards, which could explain lower levels of intrinsic motivation. Of interest, controlled athletes reported receiving a higher scholarship compared to the other two profiles. These higher scholarship athletes perceived their coaches as more controlling and experienced lower need satisfaction and autonomous forms of motivation and higher controlling forms of motivation. This is in line with the SDT literature which implies that when coaches use scholarships to control their athletes, they may undermine their intrinsic motivation (Deci, Koestner, & Ryan, 1999).

The one motivation variable that was consistent across the three profiles was athletes' degree of introjected regulation. This finding supports past research that demonstrates how introjected regulation has been associated with both adaptive (Gillison, Osborn, Standage, & Skevington, 2009; Ullrich-French & Cox, 2009) and maladaptive (Edmunds, Ntoumanis, & Duda, 2007; Lonsdale & Hodge, 2011; Ryan & Connell, 1989) motivational patterns. For example, research with adolescents shows that introjected regulation can be strongly associated with autonomous forms of motivation (Gillison et al., 2009; Ullrich-French & Cox, 2009). On the other hand, research in classroom and sport settings shows that introjected regulation may be related to negative outcomes such as burnout and anxiety (Lonsdale & Hodge, 2011; Ryan & Connell, 1989). The ambiguous nature of introjected regulation is also supported by previous

research showing it relates positively to both autonomy-supportive and controlling coaching behavior (Pelletier et al., 2001). This type of behavioral regulation requires further research in order to uncover the circumstances under which it may be more likely to cause negative outcomes.

This study offers a novel approach to the examination of autonomy-supportive and controlling coaching behaviors by considering four distinct controlling coaching behaviors and examining all behaviors in combination. However, a number of limitations are present that warrant discussion. First, the self-report, cross-sectional nature of the data may account for a portion of the variance explained simply as a result of using the same method of measurement for all variables (i.e., survey). Second, the study was confined to athletes representing one sport at one level of competition (i.e., NCAA Division I swimming), limiting the generalizability of findings. Further research should consider replicating the study by including participants from different levels of competition (e.g., high school) and other sports (e.g., team sports), which might reveal differences in cluster profiles or unique motivational differences across profiles (Ullrich-French & Cox, 2009). Third, this study was limited to the participation of teams with male coaches only. Future research should aim to recruit teams with female coaches in order to test for potential differences in athletes' perceptions of coaching behaviors or the association of those behaviors with motivational outcomes. Fourth, this study focused solely on motivation differences across profiles, clearly highlighting the advantages of higher perceived autonomy support and lower perceived controlling coaching behaviors. Future research should test for behavioral differences across profiles including effort during practice, free time spent practicing, or actual performance. Another limitation involves the examination of only need satisfaction without consideration for the extent to which these athletes experienced need thwarting (Bartholomew et al., 2011). Research implies that the effects of controlling coaching behaviors on motivation regulations is more likely to occur via need thwarting than need satisfaction (Bartholomew et al., 2011). Supporting this research, we found that the two profiles that were similar in terms of autonomy support but quite different in terms of controlling coaching behaviors (i.e., the supported and supported and controlled by rewards profiles) did not differ on need satisfaction variables. Need thwarting, which is conceptually independent of need satisfaction, would be interesting to investigate relative to these combinations of coaching behaviors. Finally, researchers could utilize a more confirmatory analytic approach to the identification of the coaching profiles such as latent profile analysis, which would help validate the profiles that emerged in this study.

The present findings provide us with important practical implications related to the coach-athlete relationship. Previous coaching literature supported autonomy-supportive behavior as the most adaptive for athletes' motivational outcomes and controlling behaviors as the least adaptive (Amorose & Anderson-Butcher, 2007; Bartholomew et al., 2011). Our findings imply that moderate levels of controlling coaching behavior are not detrimental to college athletes motivationally when paired with high autonomy support (i.e., supported and controlled by rewards profile). Given the nature and demands of NCAA Division I swimming, these findings may help explain why some swimming coaches appear to be so controlling (e.g., walking up and down the pool deck early in the morning shouting at their swimmers) yet so effective. For example, coaches providing athletes with high autonomy support (e.g., providing swimmers with choice when choosing their races or accepting suggestions for certain training sets) but at the same time moderately controlling them (e.g., using scholarships to make their swimmers focus more on training or yelling at his or her swimmers, shouting times, and finalizing events) may support adaptive forms of motivation. However, coaches should also be cautioned that while the combination of autonomy-supportive and controlling coaching behaviors does not appear to be harmful, this study does not provide evidence that experiencing

some moderate controlling coaching behaviors with autonomy support is superior to higher autonomy support without the controlling coaching behaviors.

The unique profiles that emerged in this study provide evidence that autonomy-supportive and controlling coaching behaviors are independent constructs that coaches can combine in multiple ways. The motivational characteristics of the athletes in these profiles both confirm and extend the current coaching literature. First, the findings of the current study support existing research on the coach–athlete relationship by showing that autonomy-supportive coaching behavior is associated with greater psychological need satisfaction and autonomous motivation, particularly when controlling coaching behaviors are low (i.e., supported profile). Second, the results extend the coaching literature by indicating that a combination of autonomy-supportive and controlling coaching behavior (i.e., controlling use of rewards) may not be as detrimental to athletes' need satisfaction and autonomous forms of motivation as a coach who exhibits lower autonomy support (i.e., controlled profile). Thus, coaches may be able to engage in both autonomy-supportive and some degree of controlling behaviors and still create a positive motivational environment for their athletes.

FOOTNOTE

¹Portions of this data were also used in a published study focused on the effects of scholarship status and perceived controlling use of rewards on athletes' perceptions of competence, autonomy, and intrinsic motivation within a cognitive evaluation theory framework (Matosic, Cox, & Amorose, 2014). The current study extends the first use of this data by using a profile approach to examine combinations of four controlling coaching behaviors and autonomy support in relation to all three need satisfaction variables and all motivation regulations.

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