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ABSTRACT

Autonomy supportive (rather than controlling) coaching has been shown to be important for motivating athletes and for boosting their performance. However, is this especially true for elite-level athletes, who presumably face greater stress and performance pressure? To address this question we surveyed 264 student athletes (141 recreational, 83 club sport, and 40 varsity) playing on sports teams at a U.S. public university. As expected, varsity athletes were higher than the other groups in external reward motivation and lower in intrinsic motivation. Consistent with past self-determination theory findings, coach's autonomy supportive behavior predicted intrinsic and identified motivation in all athletes, and also positive appraisals of the team experience. Most importantly, coach's autonomy support was a significantly stronger predictor of these outcomes in the varsity compared to the recreational and club groups. These findings suggest that elite-level coaches should make special efforts to be autonomy supportive (rather than controlling) with their athletes.

Key words: Autonomy Support, Coach Behavior, Motivational Climate, Self-Determination Theory, Team Structure

INTRODUCTION

Varsity athletes are an elite group within the university sports community: they are the most physically talented individuals, they have significant privileges and status, and they represent the university as a whole within regional and national competitions. However, in addition to being privileged, varsity athletes also face significant stresses and performance pressures^{1,2} that can lead to burnout.³ These include financial pressures (varsity athletes need to get and keep scholarships),¹ performance pressures (varsity athletes need to please the coach and fans so they get playing time),⁴ time pressures (varsity athletes must reconcile academics with practice and travel time),⁵ and career pressures (varsity athletes need to decide whether it will be fruitful to seek professional play).⁶ These external pressures may threaten to undermine athletes' intrinsic motivation, performance and satisfaction, unless they are somehow mitigated by the internal context of the team.^{7,8} Of course, the varsity team *coach*

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constitutes a highly significant aspect of that context: the coach sets goals, directs training, models attitudes, creates strategies, manages game situations, and much more. Unfortunately, coaches face performance pressures of their own, which may sometimes lead them to treat their athletes in a non-optimal way.⁹ In this study we asked, “How should varsity coaches try to behave, in order to mitigate external pressures and elicit the best from their athletes?”

This may be an especially important question for varsity coaches compared to coaches at other levels of competition, given that the literature reviewed above indicates that varsity (top-level) athletes experience more pressures and difficulties than club or recreational athletes, especially at Division I schools.¹ However, few studies have actually empirically compared different levels of team sport participation within the same study design. Instead, studies typically focus only on varsity athletes on one team,¹⁰ or sometimes, varsity athletes from several different varsity teams.^{11, 12} Of the few existing comparative studies, Holm-Denoma et al.¹³ found that female athletes experience higher rates of eating disorders than non-athletes; Martindale et al.¹⁴ found that varsity and club athletes have more competitive values than recreational-level athletes; and Chatzisarantis and Hagger² found that competitive athletes were lower in well-being than recreational athletes. These findings are consistent with the general premise that varsity athletes may be ‘under pressure,’ as athletes at higher skill levels demonstrated more maladaptive outcomes than athletes at lower skill levels.

If varsity athletes indeed face significantly more stresses and pressures than more casual athletes, then what can buffer them from the negative effects of these pressures?¹⁵ Below, we consider the matter from the perspective of Self-determination theory (SDT),^{16, 17} which suggests that the coach’s ability to be autonomy supportive may serve such a buffering function.

SELF-DETERMINATION THEORY

Self-determination theory is a dialectically and organismically based theory of positive motivation. One important aspect of the theory focuses on power relations between dominant individuals (i.e., coaches, parents, teachers, managers) and subordinate individuals (i.e., athletes, children, students, workers), seeking to understand how these relations influence resultant motivation in the subordinates.¹⁸ According to SDT, all human beings have a need for autonomy, defined as “endorsing one’s actions at the highest level of reflection” such that one experiences “a sense of freedom to do what is interesting, personally important, and vitalizing” (<http://www.psych.rochester.edu/SDT/>). The prototypical form of autonomous motivation is intrinsic motivation, in which one engages in the activity because it is inherently interesting, enjoyable, and challenging – the experience is its own reward. Intrinsic motivation has been shown to provide many benefits, including better subjective outcomes such as greater health, satisfaction and mood, but also including objective outcomes such as performance, persistence and creativity.^{16, 17} However, there is also another important form of autonomous motivation, called identified motivation, which covers activities that are not enjoyable, but which are nevertheless pursued with a sense of choice and volition (i.e., when an athlete undergoes a difficult training regimen). Thus, the theory acknowledges that even unpleasant actions can feel important and be fully endorsed by the person. Identified motivation also predicts many positive processes and outcomes, such as affective tone, persistence and objective performance.¹⁶

A broad research literature shows that both intrinsic and identified motivation can be detrimentally undermined or reduced by problematic social-contextual factors, such as the

presence of rewards, deadlines, threats, competition, and demanding authorities.^{16, 20} What all of these factors have in common is that they can feel controlling and coercive. When people cognitively evaluate their behavior as being caused by factors outside of themselves instead of by factors internal to themselves, their state of mind and their ability to function effectively can both suffer.¹⁷ Varsity athletes may be vulnerable to feeling controlled by a variety of strong influences, including time pressures, performance pressures, scholarship pressures, and career pressures.¹ In such cases, external motivations may result which ultimately undermine the athlete's intrinsic motivations.¹⁶

Thus the question again becomes, how can varsity athletes be buffered from these undermining stresses?²¹ SDT focuses on the crucial socio-contextual variable of authority autonomy support, in contrast to authority controllingness. To support a subordinate's autonomy is to acknowledge the selfhood and right to choose of the subordinate; to take the subordinate's perspective and provide explanatory rationales when prescribing action; and to provide as much choice as possible within the situation (i.e., over the 'how,' 'when,' 'where,' or 'with whom' of the activity, if not the 'what' of the activity).¹⁸ As a result of such treatment, the subordinate's sense of self comes to feel fully engaged in and accepting of the activity. In contrast, a controlling interpersonal style involves assigning tasks and activities without the input of the subordinate, showing little interest in how the subordinate sees things, and assuming a mantle of infallibility and imperviousness to questioning.¹⁷ As a result of feeling controlled, the subordinate may disengage his or her sense of self from the activity, coming to feel non-involved in or even resistant to that activity. And indeed, research has demonstrated the importance of authority autonomy supportiveness (vs. controllingness), in domains as diverse as management, counseling, teaching, medicine, parenting, and many others (see Ryan and Deci¹⁹ for a recent review). Specific to the sports domain, Amorose and Anderson-Butcher²² and Mageau and Vallerand⁹ found that autonomy supportive coaching predicted greater self-determined motivation, similar to our hypotheses, and Rees and Hardy²³ found that supportive coaching buffered against various stressors in a sample of tennis players.

Supporting people's autonomy is a difficult skill that can take a lifetime to master,¹⁸ since autonomy support requires time, patience, sensitivity, and genuine caring. In the sports realm, other factors that can work against the development (or deployment) of this important skill include: top-down pressure on the coach (i.e., performance pressure or criticism from higher-ups); the coach's belief that autonomy support is equivalent to permissiveness or absence of structure; the coach's fear that athletes will take advantage of granted control, always grasping for even more control; and authoritarian personality traits or learned coaching styles and traditions that prescribe a potentially overbearing approach to one's charges.²⁴ All of these factors illustrate the difficulties that varsity coaches might face in trying to become more autonomy supportive.

According to SDT, receiving autonomy support from authorities should be important for *any* subordinate, since all humans are presumed to have an innate need for autonomy. But is receiving autonomy support *especially* important for some people compared to others, or for some groups compared to others? For example, it seems logical to hypothesize that people and groups who are under the most pressure or stress, should benefit the most when their mentors are able to continue supporting their personal agency and internal causation. There are many influences upon varsity athletes coming from outside the coaching relationship (from peers, fans, sportswriters, agents, teachers). A skillful coach presumably knows how to insulate or buffer his or her athletes from these pressures,²³ perhaps in part by knowing how to foster intrinsic motivation (i.e., by giving enjoyable drills, not dull ones) and

identified motivation (i.e., by engaging the team in a compelling common purpose or identity).

Indeed, some existing research supports our hypothesis that receiving autonomy support may be more important for some people or groups than for other people or groups. Black and Deci²⁵ found that students who started an organic chemistry course with low initial autonomous motivation especially benefitted from autonomy supportive teaching during the course, developing a more internalized self-regulatory style during the semester as well as showing reduced anxiety and increased interest and objective performance. In contrast, students who began the course with strong autonomous motivation received weaker (but still significant) benefits from autonomy supportive teaching, presumably because they did not need it as much. Similarly, Pomerantz and colleagues^{26,27} have shown that autonomy supportive teaching is especially important for academically low-skill students; student skill level interacts with teacher autonomy support such that supporting autonomy is not so important for the high-skill students. Presumably the low-skill students, who are at risk for disengagement, can benefit much more from a respectful teacher who cares what they think. Hamre and Pianta²⁸ found a similar interaction pattern for economically and psychosocially at-risk versus not at-risk first graders. Because coaches play a similar educational and rule-making role as do teachers, and are subject to the same general authority-subordinate dynamics as are teachers,¹⁹ we expected that the effects of authority autonomy supportiveness upon different categories of subordinate might vary in the coaching domain as well as in the teaching domain. Specifically, we presumed that the effects of coach's autonomy support might vary significantly across different levels of competition, ranging from recreational-level to club-level to elite-level competition.

SUMMARY AND HYPOTHESES

To test these ideas, we conducted a cross-sectional survey of student athletes participating on sports teams at a large Midwestern university. Our first hypothesis was that varsity athletes would report more external motivation and less intrinsic motivation compared to recreational and club athletes.. For varsity athletes, the pressure and stress of their current sports context likely works against playing 'just for the fun of it.' We made no group-level predictions concerning introjected and identified motivation, because these are more complex motivations which were not addressed by the classic undermining literature of SDT.¹⁶

Our second hypothesis was that coach's autonomy support would be positively correlated with positive appraisals of team participation, intrinsic motivation, and identified motivation, for all groups of athletes. Such findings would be consistent with many main-effect findings in the past,⁸ and would bolster the notion that the athlete-coach relationship is of primary importance for motivating optimal performance in athletes.⁹

Our third and most novel hypothesis predicted that the autonomy-support effects would be strongest in the varsity group; i.e., an interaction between level of sports participation and autonomy support would emerge for many of the outcome variables. In other words, the context of elite sport has the potential to thwart the satisfaction of the need for autonomy, due to the external pressures to perform; for those athletes an autonomy-supportive coach might therefore be able to buffer the adverse effects of controlling events. This implies that at the varsity level, coach's autonomy support should have larger positive effects and coach's controllingness should have larger negative effects.

We also measured an additional variable, perceived structure in the sports context, in order to conduct some ancillary analyses. We define "structure" as "the extent the context provides clear rules, expectations, and ways of doing things." It seemed likely that varsity

sports team contexts have more structure, since the coach is a hired professional with a strong stake in the team's doing well, and since varsity athletes engage in more intensive and protracted practice. As a first ancillary analysis, we intended to examine the association of coach's autonomy support with structure. If "autonomy support" is construed as "permissiveness," then we might expect autonomy support to be negatively associated with structure. However, Deci et al.^{17,29} have argued and shown that autonomy support (properly construed) and structure are actually complementary, not conflicting variables. Thus we hypothesized that autonomy support would be positively related to structure. As a second ancillary analysis, we planned to compare the autonomy support, sports motivation, and structure variables as predictors of global positive appraisals of sports team participation. We expected that the coach's autonomy support effects on positive appraisals would be partially mediated by positive motivation, such that the reason an autonomy supportive coach is perceived as providing a more enjoyable experience is that the athlete develops more autonomous (i.e., intrinsic and/or identified) motivation under that coach. As a third ancillary analysis, focusing on the varsity athletes only, we intended to examine the recent won-loss record of each participant's team. Based on previous research concerning effective teaching and coaching,⁸ we hypothesized that the perceived autonomy supportiveness of the coach might be associated with the objective performance of the athlete's team. Because there was some gender imbalance across the levels of competition (described below), throughout the analyses we also examined the effects of athlete gender, making no specific predictions.

METHOD

PARTICIPANTS AND PROCEDURE

Participants were 264 student athletes and included 141 recreational sport participants, 83 club sport participants, and 40 varsity participants. There were 132 males and 132 females, and by class there were 117 freshman, 55 sophomores, 38 juniors, and 45 senior participants (9 participants did not list their year in school). The varsity athlete sample included 2 from men's track, 4 from men's football, 9 from the women's soccer team, 2 from the women's basketball team, 12 from the women's volleyball team, 1 from men's golf, 1 from women's swimming, 4 from women's track, 2 from men's wrestling, 1 from gymnastics, and 2 from cheerleading. Although some of these activities are more individual than others (i.e., golf versus basketball), all participants belong to teams whose performance against other teams is of importance to participants and their coaches. The club and recreational sport participants included members of basketball, football, soccer, and volleyball teams. Notably, the club and varsity samples had more women than men (67% and 75% women, respectively; these two means did not differ from one another), whereas the recreational sample had more men than women (67% men, 33% women). The recreational sport participants were contacted through a mass list serve that was obtained through the director of recreational sports, and the club sports athletes were contacted through each sports club president. Varsity coaches were contacted and told about the study and then after the approval of the coaches the players were contacted via e-mail. Participants were entered into a lottery drawing for one of five fifty-dollar gift certificates to the University bookstore. Additional club and varsity players were contacted through their introductory psychology course, after indicating their sports team membership on a pre-test. They were given standard research credit for their participation. All students were sent an e-mail with a link to the Survey Monkey website, where they could take the survey in their own time. The survey first asked "what level is your team?", using the well-known distinction between

recreational league terms (organized by the Student Recreational Center), club level teams (organized by independent student organizations), and varsity level teams (organized by the University Athletics department).

MEASURES

Coach's Autonomy Support. To assess coach's autonomy support, we used the 6-item version of the Sport Climate Questionnaire,^{7, 30} worded to fit the coach and sport team context. Example items are: "My coach provides me with choices and options," "My coach encourages me to ask questions" and "My coach listens to how I would like to do things." Participants read "If your team does not have a formal coach, think about your team captain." A scale of 1 (no agreement) to 5 (much agreement) was employed, and an overall coach's autonomy support score was computed by averaging the six items. Coefficient alpha for this and the other measures are provided in Table 2.

Sport Motivation. Although a published sports motivation questionnaire exists, the Sports Motivation Scale (SMS),³¹ Martens and Webber³² provided evidence that its factorial structure may be inadequate for varsity athletes. Although Mallett et al.³³ published a revised version of the SMS (the SMS-6), our measure selection occurred before this. We relied on the SDT website (http://www.psych.rochester.edu/SDT/measures/SRQ_exercise.php), which presents and discusses three motivation-for-physical activity scales, each of which differs somewhat from the others; researchers are urged to adapt the most suitable item set to their specific purposes. We employed the items of the "motivation for working out" scale, because it addresses an activity that is common to both less serious and more serious athletes. However, in wording the items, we emphasized another feature common to both recreational and varsity athletes: That they are playing on sport teams. Students read: "There are a variety of reasons why people play on a team. Please indicate how true each of these reasons is for why you play." This phrasing allowed reference to the entire athletic context in which students practice, socialize, cooperate with other team-members, and compete with team-members against other teams.

Three items referred to *intrinsic* motivation ("Because I simply enjoy playing this sport"), and three to *identified* motivation ("Because it is personally important to me to play this sport"). Three items referred to *introjected* motivation ("Because I would feel bad about myself if I didn't do it"). Finally, three items referred to *external* motivation ("Because others like me better when I play on the team," "because it helps my image," and "because I want others to see me as good at the sport"). Because these three items referred primarily to interpersonal or social concerns which may not fully tap the types of pressures varsity athletes experience, we added two additional items to correspond to the classic focus of external motivation, external rewards.¹⁶ These were: "Because of financial pressures or considerations (i.e. scholarships, stipends)" and "Because I want to get money or fame from playing this sport." We intended to test our hypotheses using both the social and reward variants of external motivation, for enhanced specificity. A scale ranging from 1 (not at all true) to 7 (very true) was employed for all motivation items.

Initial item analyses of the intrinsic motivation scale revealed that one of the initial items ("For the pleasure of discovering and mastering new sport techniques") substantially lowered alpha reliability when used with the other two items. Thus, we substituted another item which was also included in the questionnaire ("I really enjoy being on this team"), which significantly boosted the reliability of the measure. For the reader's information, substantive results were essentially the same whether we used the original or the revised intrinsic motivation scale.

Global Positive Appraisals. To assess participants' overall experience of their participation in their team sport, we focused on their experience of being on their team, consistent with the focus of the sports motivation items. Specifically, athletes responded to the statement: "Overall, this is an excellent team" and "I would recommend this team to a friend." These are two items used by the University of Missouri to assess students' global evaluations of their classes; here, we modified them to refer to sports team participation. The same 1 to 5 scale was employed as above, and the two items were averaged.

Team Structure. To measure team structure, we used four items developed for this study. Students read: "We are interested in what kind of structure this team provides for your sports participation. Please rate the truth of each statement." The four statements were "Being on this team provides me with clear rules, expectations, and guidelines for how to play the sport," "There are very clear consequences if I do not meet the expectations of the coach and the other team-members," "The rules and expectations on this team are consistently and clearly enforced and applied," and "Being on this team gives me a very well-organized and well-structured way of playing this sport." A scale of 1 (not at all true) to 7 (very true) scale was employed.

ANALYTICAL STRATEGY

We used between-subject ANOVAs to test for mean differences between the three groups of athletes, with planned contrasts between the varsity athletes and the other two groups (club and recreational; hypothesis 1). We used correlational analyses to test hypothesis 2, and moderated regression analyses to test hypothesis 3. We used regression procedures³⁴ and the Sobel test of mediation³⁵ to test whether intrinsic and identified motivation mediate the association between coach's autonomy support and global positive appraisal.

RESULTS

Table 1 contains means and standard deviations for all variables, as well as means split by the three levels of sports participation. Most participants appraised their team sports participation positively ($M = 4.06$), and the two autonomous motivations (intrinsic and identified motivation) had higher means than the three controlled motivations (external

Table 1. Means, Standard Deviations, and Means Split by Team Level

	M	SD	Team Level		
			Rec (n = 141)	Club (n = 83)	Varsity (n = 40)
Coach's autonomy support	3.77	1.02	3.82	3.68	3.78
External social motivation	3.52	1.70	3.51	3.49	3.60
External reward motivation	1.74	1.35	1.43	1.54	3.25 **
Introjected motivation	3.06	1.35	2.95	3.24	3.05
Identified motivation	5.83	1.08	5.88	5.80	5.72
Intrinsic motivation	5.79	.70	5.86	5.77	5.54 *
Positive appraisal	4.06	.84	3.91	4.24	4.23 **
Team structure	4.54	1.51	4.25	4.53	5.61 *

Note: ** = Omnibus 3-group $p < .01$, * = $p < .05$. See text for F statistics.

Note: The varsity group differs significantly from both other groups for team structure and external reward motivation, and differs from the recreational group in intrinsic motivation and positive appraisal; the club group also differs significantly from the recreational group in positive appraisal. See text for t statistics.

social and reward motivation, and introjected motivation). Men and women differed on identified motivation ($t(262) = 2.88, p < .01$; for women, $M = 6.00$, for men, $M = 5.65$), and also positive appraisal ($t(262) = 2.02, p < .05$; for women, $M = 4.17$, for men, $M = 3.96$).

MEAN DIFFERENCES BETWEEN GROUPS

To evaluate our first hypothesis, we examined mean differences between the three levels of participation (i.e., varsity, recreational, and club), testing pair-wise differences only in the case of omnibus effects. In these eight ANOVAs, there were four omnibus effects, as indicated in Table 1: for external reward motivation ($F(2, 261) = 38.17, p < .01$), for intrinsic motivation ($F(2, 261) = 3.40, p < .05$), for team structure ($F(2, 261) = 5.01, p < .05$), and for global positive appraisal ($F(2, 261) = 14.01, p < .01$). Follow-up contrasts for these four variables revealed that varsity athletes were significantly higher than recreational ($t(179) = 8.05, p < .01, d = 1.20$) and club ($t(121) = 6.55, p < .01, d = 1.19$) participants on external reward motivation, supporting our first study hypothesis regarding this form of external motivation. Also consistent with our first hypothesis, varsity athletes reported less intrinsic motivation than recreational participants ($t(179) = 2.68, p < .01, d = .40$), with a trend for varsity athletes reporting less intrinsic motivation than club participants ($t(121) = 1.56, p = .12, d = .28$). Analyses also showed that varsity athletes reported significantly more structure than recreational ($t(179) = 5.13, p < .01, d = .77$) and club ($t(121) = 3.95, p < .01, d = .72$) athletes. Finally, recreational participants appraised their team experience less positively than did club ($t(222) = 3.02, p < .05, d = .41$) or varsity ($t(179) = 1.98, p = .05, d = .30$) participants. No omnibus group mean differences were found for coach's autonomy support, suggesting that the roles of coaches across the three groups are at least somewhat commensurate. Also, no differences emerged for external social motivation, for identified motivation, or for introjected motivation.

To test whether these results were replicable when accounting for the demonstrated structural differences across the three contexts, we next repeated the ANOVAs reported above including team structure as a covariate. The pattern of significant results was unchanged, indicating that the group differences are not reducible to the fact that varsity activities are much more organized and structured than club or recreational activities. In other words, varsity athletes do not report more external or less intrinsic motivation simply because their activity is more formally structured and monitored.

CORRELATION AND REGRESSION ANALYSES

Table 2 contains correlations between the major study variables. Supporting our second hypothesis, the perceived autonomy supportiveness of the coach was associated with the two autonomous forms of motivation (intrinsic and identified). Coach's autonomy support was also associated with positive appraisals and structure. The correlation between autonomy support and structure is noteworthy because, as suggested earlier, it indicates that autonomy supportive coaches are not overly laissez-faire, unstructured and permissive; instead, they may actually provide more organization and rigor than controlling coaches.²⁹ The autonomy support correlations did not differ between men and women; that is, regression product term analyses revealed no significant interactive effects of gender and autonomy support on motivation, structure, or positive appraisal. It is also worth noting in Table 2 that external reward motivation was significantly negatively associated with intrinsic motivation ($r = -.17, p < .01$) whereas external social motivation was uncorrelated with intrinsic motivation ($r = -.02, ns$). This suggests that the form of external motivation that is strongest in varsity athletes (reward motivation) is also the form that may be most undermining of intrinsic motivation.

Table 2. Correlations among Study Variables

	1	2	3	4	5	6	7	8
1. Team structure	.83							
2. Coach's autonomy support	.36	.95						
3. Positive appraisal	.37	.52	.67					
4. External social motivation	.17	.02	-.01	.83				
5. External reward motivation	.20	-.09	-.07	.26	.75			
6. Introjected motivation	.21	-.05	-.04	.59	.35	.54		
7. Identified motivation	.28	.28	.33	.28	-.03	.26	.67	
8. Intrinsic motivation	.20	.39	.47	-.02	-.18	-.07	.47	.60

Note: For correlations $> .17, p < .01$; correlations $> .13, p < .05$.

Note: Reliability coefficients are on the diagonal.

Table 3. Correlations between Coach's Autonomy Support and the Outcome Variables, Split by Team Level

	Team Level		
	Rec	Club	Varsity
Team structure	.30	.46	.49
Positive appraisal	.50	.48	.74 *
External social motivation	-.02	-.07	.31
External reward motivation	-.13	-.03	-.13
Introjected motivation	.00	-.11	-.09
Identified motivation	.18	.27	.65 *
Intrinsic motivation	.29	.42	.61 *

Note: * = significant interaction such that the varsity group coefficient is significantly higher than the coefficient for the other two groups collapsed together. See text for statistics.

Table 3 contains correlations between coach's autonomy support and the outcomes, split by level of participation. Our third hypothesis was that these correlations would differ by group, such that coach's autonomy support has the strongest correlations in the varsity group. To test for interactions between group and autonomy support, we first computed a dummy variable which contrasted varsity athletes (coded 1) with non-varsity athletes (coded 0). Next, we computed a product interaction term by multiplying this dummy variable by coach's (centered) autonomy support. We then regressed each outcome measure upon the dummy variable, coach's autonomy support, and the interaction product term.

Table 3 indicates the three significant interactions that emerged. Specifically, for varsity athletes, the correlation of coach's autonomy support with the outcomes were significantly higher than in the other two groups in the case of intrinsic motivation (for the interaction, $\beta = .13, p < .05$), identified motivation ($\beta = .16, p < .01$), and students' overall appraisals of the sports team experience ($\beta = .16, p < .01$). Figures 1-3 present predicted values for these interactions, using autonomy support values one standard deviation above and below the mean. These effects suggest that autonomy supportive coaching matters more for elite-level athletes. Gender did not interact with these four results, with one exception: the Varsity versus

Autonomy support interaction coefficient for positive appraisal was significantly higher for women ($\beta = .30, p < .01$) than for men ($\beta = -.03, ns$; β for the 3-way interaction = $.51, p < .05$), indicating that at the varsity level, women especially appreciate being on a team with an autonomy supportive coach. The three-way interaction with gender was non-significant for the other two outcome variables of intrinsic motivation and identified motivation.

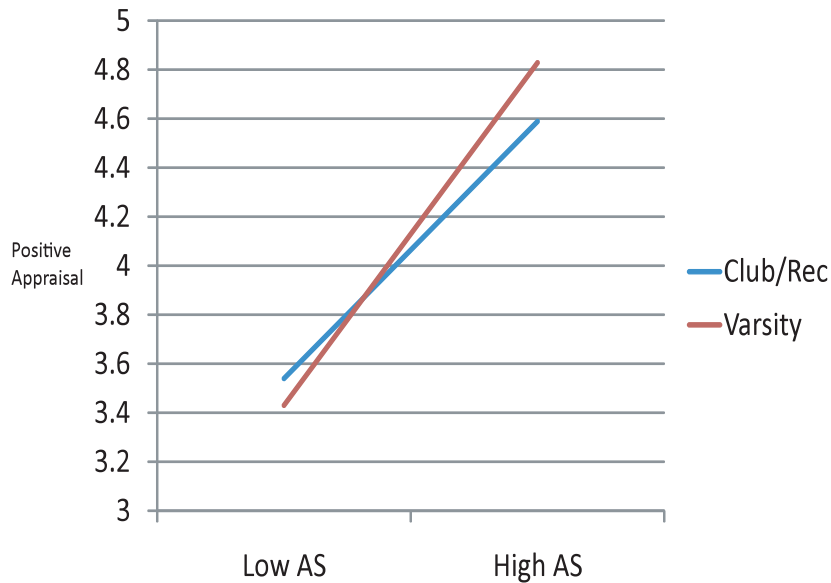


Figure 1. Predicted Values for Positive Appraisal as a Function of Athlete Type (Varsity vs. Non-Varsity) and Perceived Coach's Autonomy Support (AS)

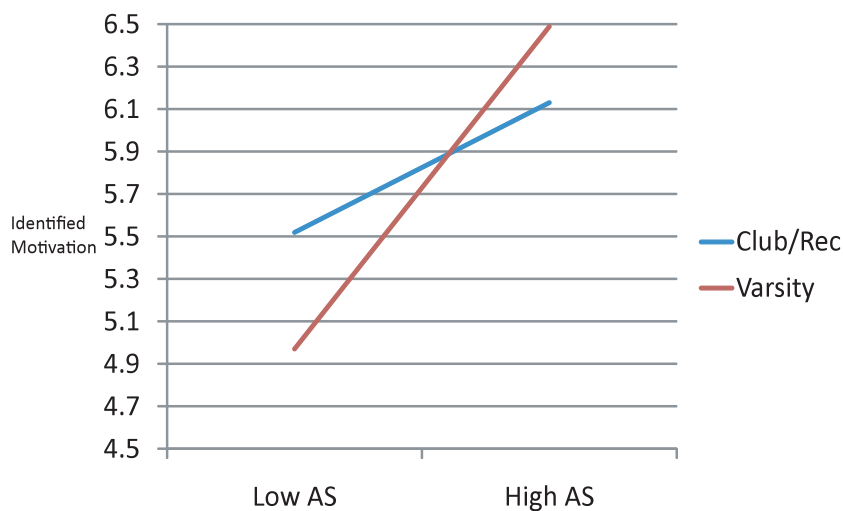


Figure 2. Predicted Values for Identified Motivation as a Function of Athlete Type (Varsity vs. Non-Varsity) and Perceived Coach's Autonomy Support (AS)

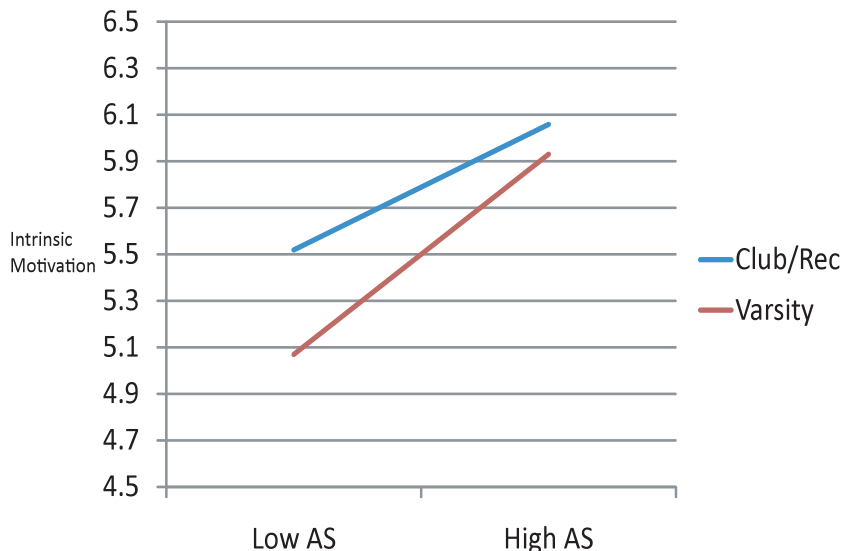


Figure 3. Predicted Values for Intrinsic Motivation as a Function of Athlete Type (Varsity vs. Non-Varsity) and Perceived Coach's Autonomy Support (AS)

Next, we compared the autonomy support and motivation variables as predictors of positive sport team appraisals, reasoning that the latter variable is the best global indicator of positive experience. We entered team type and coach's autonomy support at the first step of the regression and the five motivation variables at the second step. We hoped to find evidence that autonomous motivation mediates the coach's autonomy support associations with positive appraisals. Autonomy support was significant at step 1 ($\beta = .51, p < .01$), consistent with the correlation reported in Table 2. At step 2, intrinsic motivation was significant ($\beta = .27, p < .01$) and identified motivation marginally significant ($\beta = .11, p < .07$); introjected, external social, and external reward motivation were non-significant, and the autonomy support coefficient was reduced to .38, which was found to constitute significant partial mediation according to Sobel's test³⁵ ($z = 4.46, p < .01$). Thus, this analysis suggests that autonomy support's positive effects on overall satisfaction are in part accounted for by the intrinsic and identified motivation that are associated with autonomy support.

Finally, we examined the association between perceived coach's autonomy support and team's objective performance record, focusing only on the varsity group. Is coach's autonomy supportiveness associated with objective team performance, as well as with subjective variables within the athletes? The 2008-2009 percentage won-loss record for each University team was employed; these percentages ranged from .43 to 1.0, with a mean of .65 and a standard deviation of .22 (no won-loss record could be computed for two varsity cheerleaders, so n was 38). Autonomy support was significantly correlated with team record ($r = .32, p = .05$), suggesting that more autonomy supportive coaches produce more successful teams. Of course, it is unknown how individual varsity participants contributed to their team's overall won-loss record, as we did not collect data on whether athletes "started" or played starring roles on the team. Still, the finding is provocative and consistent with study hypotheses.

DISCUSSION

In this research, we compared three levels of university athletic participation ranging in intensity from recreational team to club team to varsity team. This was the first such study within the SDT tradition and one of the first within the sports psychology tradition. Results supported our first hypothesis that varsity athletes may experience more pressured motivation, as they reported both higher external reward motivation and lower intrinsic motivation. Varsity athletes also reported more structure and organization within their team context, as expected.

Turning to correlations, results supported our second hypothesis and re-confirm a long-standing postulate of Self-determination theory, that authority autonomy support is a crucial psychological issue for subordinates' enjoyment and performance.^{9,17,19} Specifically, coach's autonomy support was associated with positive participation appraisals and also with both forms of autonomous motivation (identified and intrinsic). The finding that coach's autonomy support predicts the two autonomous motivations is consistent with a key tenet of SDT, that authorities who respect and allow for subordinates' sense of self in the context of an activity help subordinates to internalize that activity into the self.

It is also noteworthy that coach's autonomy support was positively correlated with structure, because this association belies the common notion that to support autonomy means to be permissive or structure-free, or to be overly casual and relaxed.¹⁷ In the present case, the more coaches were perceived to support autonomy, the more intense and structured the activity was. Sheldon et al.¹⁸ suggested that autonomy support is a *mode* of relating, that can be applied to any specific content or information to be conveyed (i.e., one can be autonomy supportive as one delivers cognitive behavioral therapy, couples therapy, or even shock therapy). Our results suggest that autonomy supportive coaches are involved coaches, who are trying (successfully) to deliver the highest-quality, most organized, and most engaging sports experience possible to their athletes. Thus, it appears that coaches need not fear that granting autonomy to their athletes will encourage permissiveness or even chaos.

The third and most novel finding of this study was the hypothesized interaction between level of participation and coach's autonomy support, in addition to the main effects of autonomy support. This interaction was found for intrinsic motivation, identified motivation, and for students' overall appraisals of the sports team experience. Thus, at the elite varsity level, where the pressures and stresses can be most intense, the effects of one's coach (for good or ill) seem to loom especially large. And indeed, this large influence of the varsity coach's interpersonal demeanor upon varsity athletes makes sense: coaches dominate many waking hours of athlete's lives, they can deliver very impactful rewards and punishments, and they can make decisions that affect the student's scholarship and future life. In this light, a controlling coach can be a nightmare, but an autonomy supportive coach may be a godsend.

The fact that coach's autonomy support predicted the objective performance record of the athlete's team in the last year is also suggestive: being autonomy supportive does not have to entail "coddling" athletes at the expense of the bottom line. Coaches who develop this difficult skill – of providing structure and intensity while at the same time preserving and even enhancing the connection of the athlete's self with the activity – may actually be the most successful in win-loss terms. In other words, controlling coaching may backfire, producing worse rather than better performances by the coach's team; being supportive may provide both healthier *and* better performing athletes. Again, however, the link between an individual athlete and his or her team's group-level performance is complex, so this finding must be interpreted cautiously.

Several limitations of this study must be acknowledged. First, causality cannot be established with these cross-sectional and correlational data. Rather than coach's autonomy support causing more successful team performance, it may be that successful team performance allows the coach breathing room to be autonomy supportive, or that some third variable accounts for the association. Longitudinal data would allow for stronger inferences (i.e., data might be collected near the beginning of the athlete's sojourn on the team and then at later points afterwards, so that temporal change could be examined). Second, the varsity sample was smaller than the club and recreational sport samples, and was derived from several different teams. Ideally, more varsity athletes would be surveyed, enough so that within-team analyses could be conducted. Still, our varsity sample was representative of a wide variety of athletes and team experiences, and finding the predicted associations with somewhat low power may provide more confidence in the robustness of these associations. Third, we did not collect data on athletes' scholarship status or their role on their team (star, starter, reserve). This information could be useful to identify individuals who might feel special pressure or stress. Fourth, varsity and recreational or club sports contexts differ dramatically, and the function of the coach within those contexts may also differ considerably (e.g., on a recreational sports team the coach or captain may only initially organize the activity or have a minimal coaching role during the activity). However, the fact that coaches at the three levels were rated as similarly autonomy supportive by all athletes, and the fact that our primary findings remained significant when team-level differences in structure were controlled, provides some assurance that comparing coaches across levels of competition is meaningful.

CONCLUSION

We believe these data are informative, both theoretically and practically. Theoretically, they support the emerging notion that some people or populations may especially benefit from autonomy supportive mentoring.²⁶⁻²⁸ Although these prior studies have shown the most beneficial effects for unskilled or poorly motivated individuals, the current study finds the most benefit for highly skilled and motivated individuals (varsity athletes, compared to club and recreational athletes). Extra pressure and stress may sometimes be found at the high end of a performance continuum as well as the low end. Practically, these data indicate that elite-level coaches should be particularly attentive to supporting athletes' autonomy and choice rather than being domineering and controlling. This can be quite difficult, given the high stakes and the large degree of authority granted to elite-level coaches.²⁵ However, it may pay off both for the team's bottom line (winning) and for the athletes' health and development.

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