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Original research article

AUTONOMY SUPPORT, CONTROLLED COACHING STYLES AND SKILLS DEVELOPMENT IN WATER POLO

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Abstract. *Self-determination theory suggests that a coach's behavior can be viewed in terms of two interpersonal styles: autonomy supportive and controlling. This study was carried out in order to reveal the possible connection between coaching styles and improvement in water polo sports practice. During a three-month period, two experimental groups of young male athletes practicing water polo (each N=10), with an age range of 5 to 12, underwent special coaching treatment (autonomy supportive or controlled). An autonomy supportive style demonstrates taking the athletes' perspective and providing explanatory rationales when prescribing action, providing as much choice as possible in the situation. A controlled coaching style means assigning tasks and activities without the input of the subordinates, showing little interest in how athletes see things, and assuming a mantle of infallibility and imperviousness to questioning. Before and at the end of experimental period, athletes from both groups were measured for swim speed, and were graded for performing on two water polo techniques. The age of each participant and experience in water polo practice were taken into account. M, SD, t-test, ANOVA and correlation analysis were applied. Statistical analyses revealed that both groups of young athletes made statistically significant improvements, although there is no statistical significance between the groups. It seemed that sports training itself led to an improvement in the performance on the given tests. However, there are some indications that the acquisition of speed performance is more suited to a controlled coaching style, while the autonomy supportive style provides a better climate for developing water polo techniques.*

Key words: *coaching style, autonomy, control, water polo*

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INTRODUCTION

According to the self-determination theory, the regulation of motivation reflects a continuum comprising different levels of self-determination, ranging from amotivation to true intrinsic motivation. Human beings are portrayed as active agents in pursuit of self-fulfillment and self-determination (Deci & Ryan, 2000). The theory distinguishes between two types of behavioral regulation. Intrinsic motivation refers to participating in a type of behavior for interest and enjoyment inherent in that behavior. Extrinsic motivation describes participation in behavior for reasons separable from behavior itself. Four different types of extrinsic motivation exist within the motivational continuum: external regulation, introjected regulation, identified regulation, and integrated regulation (Deci et al., 2000; Ryan & Connell, 1989). External regulation occurs if an activity is done because of external factors, such as rewards, constraints, or fear of punishment. Motivational forces within introjected regulation are partially internalized, but self-esteem oriented pressure still regulates behavior. This includes avoidance of guilt and shame, or concerns about self-approval and the approval of other (Ryan et al., 1989). Identified regulation occurs when an individual has recognized and accepted the underlying behavior values or goals (Deci et al., 2000). The most self-determined form of extrinsic motivation is integrated regulation. It is the most complete form of internalization of extrinsic motivation. Integrated regulation involves the identification of the importance of different behavior, but also integrates those identifications with other aspects of the self. In integrated regulation, a person has fully accepted behavior by bringing it into harmony or coherence with other aspects of their goals and values (Deci et al., 2000). Amotivation is defined as a state in which a person lacks the intention to behave, and thus lacks motivation (Deci et al., 2000). Amotivated individuals experience feelings of incompetence, expectancies of uncontrollability, and perform activities without purpose.

Intrinsic motivation represents the prototypical instance of self-determined or autonomous motivation and is associated with behavioral quality and persistence, while extrinsic forms of motivational regulation are associated with a lack of sustained behavior over time (Ryan & Deci, 2000).

One important aspect of self-determination theory focuses on relations between dominant individuals (i.e. coaches) and subordinate individuals (i.e. athletes, children), seeking an answer to how these relations influence motivation and behavior in subordinates. In the sport context, the motivational climate created by the coach can affect young athletes' level of intrinsic motivation and lead to higher performance or dropping out. The interpersonal style of the coach can play a major role in shaping not only the athletes' performance, but also the psychological experiences that athletes derive from their sport participation (Vallerand & Losier, 1999).

Research guided by self-determination theory has demonstrated that autonomy-supportive coach behavior is related more to self-determined forms of motivation (Pelletier, Fortier, Vallerand & Briere, 2001). Athletes act with a sense of volition and choice, and are engaged in types of behavior because they are interesting or personally important. Research has also shown that athletes whose motivation is more self-determined tend to report positive outcomes, such as enhanced persistence, effort, performance, vitality, self-esteem and well-being (Ryan & Deci, 2002). In contrast, coaches exhibiting a controlling interpersonal style behave in a coercive, pressuring, and authoritarian way to impose a specific and preconceived way of thinking and behaving upon their athletes. As a consequence, the external pressures applied by the coaches are

perceived by their athletes to be the origin of their own behavior. Controlling coaching behavior can induce a change in the athletes' perceived locus of causality from internal to external (Mladenovic, 2009; 2010a; 2010b). The loss of sense of personal causality undermines the athletes' self-endorsement and contributes to external forms of motivation. Such pressures force an athlete into engaging in the desired behavior with the sense of obligation or guilt (Bartholomew, Ntoumanis & Thogersen-Ntoumani, 2011).

Using SDT as a guiding framework, the purpose of this study was to explore if the motivational climate created by autonomy support and a controlled coaching style affect sport skills improvement in water polo. The aim was also to observe the behavior of young athletes affected by a certain coaching style (autonomy supportive or controlled).

METHOD

The sample of participants

The experiment included 20 young athletes from water polo club Stari grad, Belgrade, Serbia. All of the participants were male, age range from 5 to 12 years. Since it was a convenience sample, it consisted of athletes from one sport club, and criteria for dividing participants into one of two experimental groups was age. The experimental groups were adjusted based on the age of the participants. In each group there were equal numbers of participant in terms of the age range. The total number of participants were 20, 10 in each group.

The measuring instruments

Before the experiment and at the end of the experimental period, all of the participant were measured for swim speed and technical elements of water polo. Test 1, swim speed, was measuring time for a distance of 12,5m. In Test 2, water polo trainers graded technical elements from 1 to 5. In this test, the participants completed two tasks. The first one required the initial position with the ball in water and waving in. The second assignment was waving with moving in water. When giving grades for test 2, the coaches took into account the individual differences of age and overall training period in water polo.

Procedure

The participants divided in two groups were underwent different experimental treatment for three months. The coach was introduced to the SDT concept and its application before the start of the experiment, and had training on different coaching styles. During the experimental period, the coach was under the supervision of the first author of this paper.

In the first group, the coach applied the autonomy support coaching style, operationalized as taking the athletes' perspective and providing explanatory rationales when prescribing action, providing as much choice as possible in the situation.

In the second group of participants, the coach applied a controlled coaching style, operationalized as assigning tasks and activities without the input of the subordinates, showing little interest in how athletes see things, and assuming a mantle of infallibility and imperviousness to questioning.

In the group treated with the controlled coaching style, the coach made sure that negative connotations did not overcome the limits that might have negative consequences on the young athletes' mental health and psychological development.

The behavior of the participants in both groups were observed during the experimental period.

Statistical analysis

The statistical analyses were carried out using SPSS version 19.0 for Windows. Descriptive statistics (M, SD, t-test) was applied for obtaining the measures for the swim speed test and technical elements of water polo for the autonomy supported and controlled group. In order to examine the differences between the experimental groups, the One-way ANOVA was applied. Pearson's coefficient was calculated in order to explore the possible connection between the measures.

RESULTS

The results revealed that the obtained Mean values for both experimental groups, before and after the experimental period, in the applied tests (swim speed and water polo technique grades) were statistically significant (Tables 1-3).

Table 1 M and t-test for swim speed, before and after the experimental period.

Coaching style	Experimental period	M	SD	t-test	df	Sig.level
Autonomy	Before	0.134700	0.0261356	16.298	9	0.000
support	After	0.124100	0.0513731	7.639	9	0.000
Controlled	Before	0.141500	0.0224024	19.974	9	0.000
	After	0.117530	0.0267154	13.912	9	0.000

As Table 1 shows, the swim speed improved throughout the experimental period of three months, for both the autonomy supported and controlled group of young athletes. The one way ANOVA did not reveal a statistical significance between the experimental groups. It can be concluded that the training practice itself improved the swim speed, no matter what coaching style was applied. However, since the data indicate that the controlled group showed greater improvement in swim speed, there might be another possibility that should be researched further. A stressful interpersonal and motivational climate created by the control orientated coaching style could make the controlled group more alert and aroused for improving speed.

In Tables 2 and 3, the data representing improvement of practicing water polo techniques are shown. In can be noticed that both groups of young athletes made statistically significant improvement. The one-way ANOVA showed that, again, there is no statistical significance between the groups. It can be said that sports training itself led to an improvement in performing the water polo technique. However, although not significant, the improvement was slightly better in the autonomy supported experimental group. This finding should be further explored. It might be the case that the autonomy supported motivational climate is better suited for learning complex motor skills, unlike the controlled climate which is maybe a better environment for speed acquisition.

Table 2 M and t-test for water polo technique 1 (initial position with the ball in water and waving in), before and after the experimental period

Coaching style	Experimental period	M	SD	t-test	df	Sig.level
Autonomy	Before	2.70	1.160	7.364	9	0.000
support	After	3.80	0.789	15.234	9	0.000
Controlled	Before	3.00	0.816	11.619	9	0.000
	After	3.70	0.949	12.333	9	0.000

Table 3 M and t-test for water polo technique 2 (waving with moving in water), before and after the experimental period

Coaching style	Experimental period	M	SD	t-test	df	Sig.level
Autonomy	Before	3.00	0.816	11.619	9	0.000
support	After	3.70	0.826	14.212	9	0.000
Controlled	Before	3.20	0.789	12.829	9	0.000
	After	3.70	0.675	17.335	9	0.000

A correlation analysis was calculated in order to further explore the relations between sports measures in the two experimental groups. In Table 4 we find the correlation coefficients among the measures of swim speed and water polo techniques, for the autonomy supported experimental group. Table 5 represents the correlation coefficients among the measures of swim speed and water polo techniques, for the controlled group.

Table 4 Pearson's coefficient of correlation between swim speed and water polo technique measures for the autonomy supported experimental group (N=10)

Test (experimental period)		swim speed (before)	swim speed (after)	water polo technique 1 (before)	water polo technique 1 (after)	water polo technique 2 (before)	water polo technique 2 (after)
swim speed (before)	r	/	0.825	-0.624	-0.220	-0.385	-0.509
	sig.		0.003	0.054	0.542	0.272	0.133
swim speed (after)	r	0.825	/	-0.796	-0.523	-0.498	-0.576
	sig.	0.003		0.006	0.121	0.143	0.082
water polo technique 1 (before)	r	-0.624	-0.796	/	0.777	0.352	0.710
	sig.	0.054	0.006		0.008	0.318	0.021
water polo technique 1 (after)	r	-0.220	-0.523	0.777	/	0.173	0.753
	sig.	0.542	0.121	0.008		0.634	0.012
water polo technique 2 (before)	r	-0.385	-0.498	0.352	0.173	/	0.331
	sig.	0.272	0.143	0.318	0.643		0.351
water polo technique 2 (after)	r	-0.509	-0.576	0.710	0.753	0.331	/
	sig.	0.133	0.082	0.021	0.012	0.351	

It can be noticed that the swim speed measured after the experimental period is in a significantly negative correlation with all the measures of the water polo technique, in the

controlled group. Table 5 also shows that the initial measure of swim speed is negatively correlated with the measures of the second water polo technique.

A certain negative relation between the swim speed and water polo techniques, for the autonomy supported group, showed up just between the values of swim speed after the experimental period and the initial measure of the first water polo technique (Table 4).

Table 5 Pearson's coefficient of correlation between swim speed and water polo technique measures for the controlled experimental group (N=10)

Test (experimental period)		swim speed (before)	swim speed (after)	water polo technique 1 (before)	water polo technique 1 (after)	water polo technique 2 (before)	water polo technique 2 (after)
swim speed (before)	r	/	0.756	-0.623	-0.625	-0.789	-0.764
	sig.		0.011	0.055	0.053	0.007	0.010
swim speed (after)	r	0.756	/	-0.644	-0.798	-0.877	-0.691
	sig.	0.011		0.045	0.006	0.001	0.027
water polo technique 1 (before)	r	0.623	-0.644	/	0.574	0.863	0.202
	sig.	0.055	0.045		0.083	0.001	0.576
water polo technique 1 (after)	r	-0.625	-0.798	0.574	/	0.831	0.711
	sig.	0.053	0.006	0.083		0.003	0.021
water polo technique 2 (before)	r	-0.798	-0.877	0.863	0.831	/	0.543
	sig.	0.007	0.001	0.001	0.003		0.105
water polo technique 2 (after)	r	-0.764	-0.691	0.202	0.711	0.543	/
	sig.	0.010	0.027	0.576	0.021	0.105	

The correlation matrix between water polo techniques 1 and 2 revealed that there might be some positive transfer in learning the technique in both experimental groups.

DISCUSSION

Some research showed that approximately 33% of young athletes discontinue their involvement in competitive sport each year, some due to pressure imposed by overdemanding and/or disliked coaches (Bartholomew et al., 2011). In one study, Pelletier et al. (2001) assessed swimmers' perception of their coaches' autonomy supportive and controlling interpersonal behavior. The study showed that a coach may engage in both controlling and autonomy supportive behavior simultaneously and to different extents. The absence of autonomy supportive behavior cannot automatically be equated with the presence of controlling coach behavior. The absence of autonomy support might be indicative of a more neutral style.

There are some recent studies that indicate a connection between controlled and autonomous motivation, subjective psychological experience of interpersonal climate and performance. Autonomous motivation predicts a positive effect, while controlled motivation, as well as amotivation, both lead to negative effects. Positive and negative effects, positively and negatively predict performance (Gillet, Vallerand, Lafreniere &

Bureau, 2013). Research has also shown that positive responses to sport or exercise activity predict more frequent sports behavior (Kwan & Bryan, 2010; Schneider, Dunn, & Cooper, 2009). For example, autonomous motivational orientation for exercise behavior leads to a more positive exercise-related effect, which subsequently leads to more self-determined regulations for exercise (Kwan, Caldwell, Hooper, Magnan & Bryan, 2011).

We proposed that the coaching motivational style may set conditions that reinforce autonomous or controlled motivational orientation and affect sport skills improvement in water polo. It has been shown that experimental manipulation of one's coaching style based on autonomy support or control of behavior provoked a negative or positive interpersonal climate.

At the beginning of the experimental period, a study of the young athletes' behavior showed that the controlled group became more interconnected and directed toward cooperation. It seemed like the members of the controlled group were trying to stick together, by supporting each other to fulfill assignments given to them by the coach. It was especially noticed that they were trying to push the less efficient members of the group toward group standards, in order to avoid negative feedback from the coach. However, at the end of the experimental period, it was noticeable that their behavior reflected more anxiety, lower self-esteem and less motivation for the training practice.

The autonomy supported experimental group did not manifest any symptoms of a negative psychological experience. They reflected a positive interpersonal climate, and signs of demotivation or disengagement did not appear. At the end of the experimental period, the coach reported difficulties in achieving a supportive climate and maintaining boundaries. Supporting people's autonomy is a difficult skill that can take a lifetime to master, since autonomy support requires time, patience, sensitivity, and genuine caring.

In the sports realm, many factors can work against the development (or deployment) of supporting one's autonomy. They 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 the granted control, always grasping for ever more control; and authoritarian personality traits or learned coaching styles and traditions that prescribe a potentially overbearing approach to one's charges. All of these factors illustrate the difficulties that coaches might face in trying to become more autonomy supportive (Sheldon & Watson, 2011).

Conditions and circumstances that lead to greater performance in an autonomous or controlled interpersonal context should be examined in future research. However, the effect of a different interpersonal climate created by a person of authority on the psychological well-being and long-term goals in sport development has already been determined (Friederichs, Bolman, Oenema & Lechner, 2015; Gillet, Gagne, Sauvagere & Fouquereau, 2013). Autonomous motivation goes along with more enjoyment, more free choice and less stress, more confidence about sports skills, putting more effort, intentions and commitment in sport practice, and perceiving sport as more personally valuable. Controlled motivation stimulated by a controlled coaching style displays less perceived choice, and compulsory feelings of pressure and obligation (Teixeira Silva, Mata, Palmeira & Markland, 2012).

CONCLUSION

The results of this study emphasize the importance of the atmosphere created by authority figures, such as a coach (Alvarez, Balaguer, Castillo & Duda, 2009; Lim & Wang, 2009; Taylor, Ntoumanis & Smith, 2009). There are two main weak points of this study: the results are not consistently significant, and the experimental manipulation of the autonomy supportive coaching style at some point might be perceived as permissiveness or absence of structure. However, there are some indications that the controlling coaching style might be connected with better improvement on the tests that measure speed of skill performance, and that autonomy supportive coaching style is better suited for the learning and development of complex sport skills. Future studies should explore conditions and circumstances under which each of these two coaching styles (or, maybe, their combination) could be more effectively connected with improvement in sports practice and performance.

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PODRŽAVAJUĆI I KONTROLIŠUĆI OBLICI PONAŠANJA SPORTSKIH TRENERA I RAZVIJANJE VEŠTINA U VATERPOLU

Teorija samodeterminacije (SDT) sugeriše da se ponašanje sportskog trenera može opisati kroz dva interpersonalna stila: podržavajući (autonomy support) i kontrolišući (controlled). Ova studija sprovedena je sa ciljem da se utvrdi potencijalna povezanost između tako definisanih trenerskih stilova i napredovanja u savladavanju elemenata vaterpola. Tokom perioda od tri meseca, dve eksperimentalne grupe mladih sportista koji treniraju vaterpolo (svaka grupa N=10), starosti 5 do 12 godina, bile su podvrgnute određenom psihološkom pristupu trenera (podržavajućem ili kontrolišućem). Podržavajući stil uvažava stanovište sportiste, pruža objašnjenje za zahtevanu akciju, nudi alternative u skladu sa situacijom. Kontrolišući stil odnosi se na dodeljivanje zadataka bez objašnjenja, nezainteresovanost za tačku gledišta sportiste, oreol neporešivosti i nepristupačnosti. Na početku i na kraju eksperimentalnog perioda, sportistima iz obe grupe, merena je brzina plivanja i ocenjivano je izvođenje dve vaterpolo tehnike. Uzrast ispitanika i iskustvo u treniranju vaterpola, uzeti su u obzir. Podaci su obrađeni računanjemAS, SD, t-testa, analize varijanse i korelacije. Statistička obrada pokazala je da su obe grupe mladih sportista značajno napedovale, iako nema statistički značajnih razlika između grupa. Može se reći da je sportski trening sam po sebi doprineo napretku u usavršavanju merenih varijabli. Međutim, postoje indikacije da unapređenje brzine plivanja ide uz kontrolišući stil trenera, dok podržavajući stil stvara bolju atmosferu za usavršavanje vaterpolo tehnika.

Ključne reči: *stil trenera, autonomija, kontrola, vaterpolo*