

Mental skill training to enhance sport motivation in adolescents

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Abstract

Adolescence is a period of strong changes for individuals; it can cause an important load of stressful stimuli with consequent anxious states with different intensity (Ferron et al., 1984). A large number of studies demonstrated that practicing sports and physical activity can lead to a large number of benefits for physical and mental health and can increase the vitality (Bouchard, Blair, & Haskell, 2007; Pelletier, Vallerand, & Sarrazin, 2007) and the improvement of some psychological and social factors in adolescents, such as self-esteem, mental well-being, academic performance and relationships with parents (Slutzky & Simpkins, 2009, Liu et al, 2014). Even if these benefits are known by the most part of people and the culture of an active lifestyle is broadening, there's a large number of people that stop participation or start to have a sedentary lifestyle (Sarrazin, Boiché, & Pelletier, 2007). According to Self Determination Theory (Ryan & Deci, 2007), the engagement in sport can be determined by factors as rewards, evaluations, pressure or by opinions from others (Ryan & Deci, 2007), defined as external or/and people can be moved by interest, curiosity or the desire for improvement. It can be useful to act at different levels in order to maintain sport participation. According to Hodge, Sleivert and Mackenzie (1996), Mental Skill Training can be a valid method to foster motivation, throughout goal setting, self-talk, relaxation and imagery. Our study had the aim to investigate the relationship between a mental skill training program and the level of sport motivation of a group of teenage swimmer athletes.

Key words: sport motivation, physical activity, adolescence, mental skill, athletes

Introduction

Adolescence is the age of change, a phase of transition between childhood and adulthood. It's featured by greater experimentation, changes in social interaction and cognitive development, whose ultimate goal is to achieve independence and skills for a balanced adult life (Spear, 2000). In this period, adolescents have to cope with a high number of stressors, related to body changes, evolution in social relations, research for their own identity and place in the world. For a part of them, the transition occurs naturally, for others it involves a considerable load of stressful stimuli that can cause anxiety with different intensity (Ferron et al., 1984). According to scientific literature, physical activity and sports can be a valid support in balanced development during adolescence. Malina and Cumming (2003) outlined some possible benefits of participation in sport activities, such as growth and maturation effects, increased fitness, self-concept or self-worth effects, social competence and moral development. The research by Liu et al. (2014) highlighted that physical activity is coherently linked to the improvement of a variety of psychological and social factors in adolescents, such as improvement of mental well-being, academic performance, relationships with parents and self-esteem. Steen, Kachorek, and Peterson (2003) found that adolescents reported characteristics like leadership, wisdom, and social intelligence were acquired through life experiences fostered by extracurricular activities. Even though these benefits are known to most, there is a growing sedentary attitude in boys and adults and much concern has been expressed about that (Sallis et al, 1992), many adolescents and adults stop their active lifestyle (Sarrazin, Boiché, & Pelletier, 2007). The inactive lifestyle has an important impact on health status of young people but also can conduct to inactive adults. Thus, the failure to promote physical exercise among youngsters may have implications for their degree of wellness and quality of life across the lifespan. Understanding better how to motivate physical activity and lifestyle changes is a critical issue. One domain that has the potential to reinforce a physically active lifestyle for boys and girls is organized sport. Another context of possible influence on young people's physical activity levels is school-based physical education. According to Self Determination Theory (Ryan & Deci, 2007), the engagement in sport can be determined by factors as rewards, evaluations, pressure or by opinions from others (Ryan & Deci, 2007), defined as external or/and people can be moved by interest, curiosity or the desire for improvement. It can be useful to act at different levels in order to maintain sport participation. According to Hodge, Sleivert and Mackenzie (1996), Mental Skill Training can be a valid method to foster motivation, throughout goal setting, self-talk, relaxation and imagery. Following the Achievement Goal Theory, Papaioannou & MacDonald (1993) reported that there's a positive relationship between a task orientation

and intrinsic motives for participation in physical education and sports. Our study had the aim to investigate the relationship between a mental skill training program focused on defining goals, internal dialogue, relaxation and imagery and the level of sport motivation of a group of teenage swimmer athletes. In general, this study, together with others, can constitute the baseline to define projects to foster sport motivation in students, supporting teaching of physical education.

Motivation in sport and physical activity

Motivation can be defined as the force that energizes and directs behavior (Roberts and Treasure, 2007). It can affect the perceived reasons for engaging in an activity. The studies about motivation investigate and define the reasons to initiate, sustain and stop behavior. Sports and, in general, physical activity have a social connotation that led to question regarding the role of different social agents in the matter, in particular for youth sport participants (Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002). According to Reeve (1996), motivation involves the internal processes (i.e., needs, emotions, and cognitions) that give energy and direction to behavior. According to expectancy-value model of achievement choices (Eccles Parsonset al., 1983), parental belief systems and the related behavior are linked to children's degree of involvement in physical activities and perceptions of ability or competence (Bois, Sarrazin, Brustad, Trouilloud, & Cury, 2002; Fredricks & Eccles, 2002). Further, several studies suggest that adolescents' motivation and orientations are also related to coaches' and teammates' goal orientations (Escartí, Roberts, Cervello, & Guzmá, 1999). The hierarchical model proposed by Vallerand & others foresee three levels for motivation: global (regarding personality), contextual (regarding life domain), and situational (regarding state) levels (Vallerand & Rousseau, 2001). In terms of motivation, it's important to consider also the conceptual framework of achievement goal theories (Ames, 1992; Dweck, 1986; Nicholls, 1989). According to these, goal perspectives are the crucial dimension influencing variations in investment and involvement in achievement activities. In particular, individual's goal perspective impacts how that person cognitively and affectively responds to and acts in achievement settings. Two distinct goal perspectives are presumed to be operating in achievement environments, namely task involvement and ego involvement. When task involved, the experience of learning, personal improvement, and/or meeting the demands of the task lead to a feeling of success and individual's perceptions of her/his own ability are self-referenced. On the other hand, in ego involvement, beating others and demonstrating superior ability are the bases for subjective success. When a person adopts an ego-involved goal perspective, the perceptions of competence are normatively or linked to others. Researchers have investigated the motivational implications of emphasizing task- versus ego-involved goals in the variety of achievement situations endemic to recreational and high-level sport programs and in the context of physical education (Duda, 1992, 1993, 1995; Papaioannou, 1995; Treasure & Roberts, 1994).

Sport motivation in Self Determination Theory

The assumption of Self Determination Theory is that people have inherent tendencies to move towards greater self-actualization (Schneider, Pierson, & Bugenthal, 2014). At the base of movement there are three basic psychological needs: competence, relatedness and autonomy (Deci & Ryan, 1985). The competence is the individual's need to have and meet challenges, to express their abilities and to develop their confidence. As regards relatedness, it is linked to the need to belong to a community, as part of a whole. Finally, autonomy is related to the possibility to act according to his or her own values and interests. When the behavior is autonomous, it is a real manifestation of the self (Deci & Ryan, 2002; Ryan & Deci, 2007) and individuals have integrated the ongoing behavioural regulations (Ryan, 1995). Ryan & Deci (2017) explain the SDT framework referring to six theories. The first one is cognitive evaluation theory (the social environment may help or hinder intrinsic motivation, performance, and wellness; the second one is organismic integration theory (Ryan & Connell, 1989), that explains how external regulations may become integrated in the self. The third theory is causality orientations theory, which explains how enduring personality dispositions may favour more autonomous versus more externally controlled behavior (Deci & Ryan, 1985). The fourth theory is basic needs theory, which explains how the satisfaction of basic psychological needs affects well-being and vitality (Ryan, 1995). SDT's fifth theory is goal contents theory, stating that people's goals relate to basic needs satisfactions and wellness (Kasser & Ryan, 1996). The last theory is relationship motivation theory (Deci & Ryan, 2014), which analyzes the interplay of autonomy and relatedness needs in mutually satisfying relationships. Deci & Ryan (2002) say that people internalize and assume the responsibility of actions when their experience in terms of autonomy, competence and relatedness is high. The level of autonomy, according to SDT, has to be visualized as a continuum where at one end there's the amotivation, that means the lowest level of self-determined motivation, on the other end the maximum level of motivation that is the intrinsic one (Deci & Ryan, 2002). On this continuum, the authors put different types of motivation. External regulation refers to a motivation moved by external rewards or punishments. The next is the introjected regulation that refers to people who act in order to avoid feeling of guilt and shame or to feel worthy and/or by guilt and it is still a controlled form of motivation. With identified regulation, it starts a certain level of autonomy. It is when one's behavior is experienced as personally important and worthwhile with high levels of personal commitment. The final type of extrinsic

motivation is integrated regulation. It occurs when the behavior is seen as congruent with the individual's objectives and needs. At the end of the continuum there's the intrinsic motivation, very highly self-determined, where the motivation for acting derives from satisfactions found in the behavior itself (Deci & Ryan, 2002). Positive outcomes seem to derive from the more autonomous types of motivation (i.e., identified, integrated and intrinsic). Individuals who are autonomously regulating their behavior have frequently a well-being feeling (Deci & Ryan, 2008), experiencing also task involvement over ego involvement (Ryan & Deci, 2000), intrinsic goals and objectives (Sheldon, Ryan, Deci, & Kasser, 2004), action instead of avoidance orientations (Nien & Duda, 2009).

Material & Methods

Participants

The study has carried out in two sports centers in Rome. The researchers of HERACLE Laboratory, in Niccolò Cusano University, directed by Prof. Francesco Peluso Cassese, managed a Mental Training protocol to swimmer athletes of the two structures, using the spaces provided by the sports centers. The participation to the research was given voluntarily and 33 adolescent athletes, Parents or legal guardians of the children signed an informed consent form and processing of personal data, also authorizing the use of data anonymously and aggregated within the research program. Subsequently, due to dropouts and absences, data were collected on a group of 14 adolescents (average age = 13.9, DS = 1.5; 85.7% females).

Procedure

The intervention protocol consists of 14 group sessions of Mental Skill Training, of one hour each, over a six-month period. Each session consists of goal setting (goals for training and competition), self talk management (awareness of limiting thoughts and generation of empowering thoughts), imagery (athletic movement for training and different phases of the competition). During the interval between one session and another, the participants continue their mental training exercises individually, writing training and competition goals, limiting and empowering thoughts and the visualization on a Work Journal provided to them by the research team. The research hypothesis supposes an improvement of the level of sport motivation following the intervention of mental skill training. The participants completed the Sport Motivation Scale II before starting the mental training protocol (T0) and at the end of the protocol (T2).

Instruments

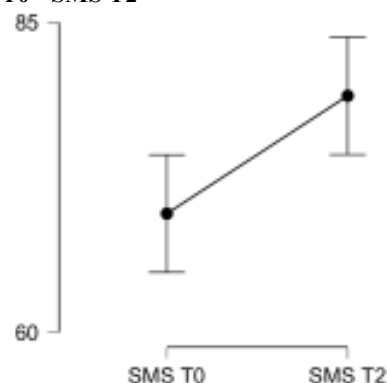
Sport Motivation Scale II (Pelletier, L.G., Rocchi, M. A., Vallerand, R. J., Deci, E. L., & Ryan, R. M., 2013)

The scale evaluates the individuals' level of motivation towards sport, using the self-determination theory framework. The questionnaire has 18 items, divided into 6 subscales, with a 7-point Likert scale response range, indicating the level of personal accordance with a list of reasons for practicing the sport the participants are involved in. The factor of motivation measured are intrinsic regulation (inspired solely from the interest and enjoyment that a person finds in an activity), integrated regulation (when a person has fully integrated a motivation within himself), identified regulation (the activity is still performed for extrinsic reasons, e.g. to achieve personal goals, however, it is internally regulated and self-determined), introjected regulation (the formerly external source of motivation has been internalized), external regulation (behavior that is controlled by external sources, such as material rewards or constraints imposed by others), non regulation (neither intrinsic motivation nor extrinsically motivated).

Results

The available data show a significant variation in the total score of the sport motivation scale between the pre- and post-intervention questionnaire, as shown by the descriptive plot below (Fig. 1).

Fig. 1 - Descriptives Plots SMS T0 - SMS T2



It can be seen from the line highlighted under the "Sig." column below (along the line "Wilks' Lambda") that $p = .029$, that means it is less than .05 (i.e. satisfies $p < .05$), therefore the one-way MANOVA model for repeated measures is statistically significant (Fig. 2 -3). In other words, there is a difference in the six subscales combined over time (pre- and post-intervention) when a mental training program is introduced, in particular in subscale Intrinsic Regulation and Identified Regulation.

Fig. 2 – 3 – Multivariate Tests and Test of Within-Subjects Contrasts

One-way repeated measure MANOVA

		Multivariate Tests ^a					
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Between Subjects	Intercept						
	Pillai's Trace	,993	192,915 ^b	6,000	8,000	,000	,993
	Wilks' Lambda	,007	192,915 ^b	6,000	8,000	,000	,993
	Hotelling's Trace	144,687	192,915 ^b	6,000	8,000	,000	,993
	Roy's Largest Root	144,687	192,915 ^b	6,000	8,000	,000	,993
Within Subjects	Time						
	Pillai's Trace	,769	4,431 ^b	6,000	8,000	,029	,769
	Wilks' Lambda	,231	4,431 ^b	6,000	8,000	,029	,769
	Hotelling's Trace	3,323	4,431 ^b	6,000	8,000	,029	,769
	Roy's Largest Root	3,323	4,431 ^b	6,000	8,000	,029	,769

a. Design: Intercept
Within Subjects Design: Time

b.

Measure	(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^a	
						Lower Bound	Upper Bound
Intrinsic_Reg	1	2	-3,429 [*]	,693	,000	-4,926	-1,931
	2	1	3,429 [*]	,693	,000	1,931	4,926
Integrated_R	1	2	-1,143	,710	,131	-2,676	,391
	2	1	1,143	,710	,131	-.391	2,676
Identified_R	1	2	-2,214 [*]	,689	,007	-3,702	-,726
	2	1	2,214 [*]	,689	,007	,726	3,702
Introjected_R	1	2	-1,286	,963	,205	-3,367	,795
	2	1	1,286	,963	,205	-.795	3,367
External_R	1	2	,071	,579	,904	-1,179	1,321
	2	1	-.071	,579	,904	-1,321	1,179
NoReg.	1	2	-,786	,482	,127	-1,828	,256
	2	1	,786	,482	,127	-.256	1,828

Based on estimated marginal means
*. The mean difference is significant at the
b. Adjustment for multiple comparisons: Bonferroni.

Tests of Within-Subjects Contrasts								
Source	Measure	Time	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Time	Intrinsic_Reg	Level 2 vs. Level 1	164,571	1	164,571	24,471	,000	,653
		Integrated_R	18,286	1	18,286	2,592	,131	,166
	Identified_R	Level 2 vs. Level 1	68,643	1	68,643	10,333	,007	,443
		Introjected_R	23,143	1	23,143	1,782	,205	,121
	External_R	Level 2 vs. Level 1	,071	1	,071	,015	,904	,001
		NoReg.	8,643	1	8,643	2,653	,127	,169

Measure	(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^a	
						Lower Bound	Upper Bound
Intrinsic_Reg	1	2	-3,429 [*]	,693	,000	-4,926	-1,931
	2	1	3,429 [*]	,693	,000	1,931	4,926
Integrated_R	1	2	-1,143	,710	,131	-2,676	,391
	2	1	1,143	,710	,131	-.391	2,676
Identified_R	1	2	-2,214 [*]	,689	,007	-3,702	-,726
	2	1	2,214 [*]	,689	,007	,726	3,702
Introjected_R	1	2	-1,286	,963	,205	-3,367	,795
	2	1	1,286	,963	,205	-.795	3,367
External_R	1	2	,071	,579	,904	-1,179	1,321
	2	1	-.071	,579	,904	-1,321	1,179
NoReg.	1	2	-,786	,482	,127	-1,828	,256
	2	1	,786	,482	,127	-.256	1,828

Based on estimated marginal means
*. The mean difference is significant at the
b. Adjustment for multiple comparisons: Bonferroni.

Discussion

In this study we investigate the relationship between motivation and a mental skill program. We designed the study to assess motivation among a sample of adolescents involved in sports at a competitive level. Our analysis substantiate the hypothesis that the practice of mental training has a positive influence on sport motivation, in particular in self-determined motivation such as Intrinsic and Identified. This is consistent with the results by Pelletier et al. (2001) about swimmer athletes, where autonomy-supportive is linked to more autonomous (e.g. identified and intrinsic) forms of motivation but also to Deci and Ryan's results (1991). Although there is a statistically significant difference, without a control group that did not train, we cannot conclude that the program "caused" the change of these six dimensions, but "suggests" that it "could" have determined them. In terms of future applicability, it would be worth studying with further investigation, adding a control group and increasing the number of participants.

Conclusions

According to literature, the intention to be physically active after the school years was positively predicted only by intrinsic motivation. Similar positive relationships between intrinsic motivation and future intentions toward an activity were reported by Biddle et al. (1995) in PE, by Pelletier et al. (1995) in sport, and by Vallerand et al. (1993) in education. Our finding can help in the process to consider the significant role of PE in promoting a physically active life style. When adolescents are intrinsically motivated they are less likely to feel bored in PE or sports. When viewed in light of self-determination theory, our findings could be useful in discussions of physical activity adherence. The basic premise of the self-determination model is that people possess psychological needs for autonomy, competence and social relatedness. Once validated the protocol, a particular focus will be placed to maximize motivation in physical education at school among children and adolescents, in order to embrace also young people who do not practice sports at competitive or amateur level. It is, therefore, important that such and others similar positive experiences are provided by PE teachers and PE

curricula. It is important that intrinsic motivation is fostered and promoted in sports and PE, because it can lead to positive outcomes and may facilitate the general aim of physical activity in adult life. It is also clear that perceptions of competence have a central role in PE and the satisfaction of the need for competence can lead to self-determined forms of behaviour

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