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To cite this article: Paulo Martins & Samuel Pedro (2017) Motivational Regulations and Recovery in Olympic Wrestlers, *International Journal of Wrestling Science*, 7:1-2, 27-34, DOI: [10.1080/21615667.2017.1346345](https://doi.org/10.1080/21615667.2017.1346345)

To link to this article: <https://doi.org/10.1080/21615667.2017.1346345>



Published online: 13 Mar 2018.



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Motivational Regulations and Recovery in Olympic Wrestlers

Paulo Martins¹ and Samuel Pedro²

ABSTRACT. This study explores the relationship between motivational regulations in the self-determination continuum and recovery processes in wrestlers. Such knowledge may help coaches creating and maintaining a positive climate both in training and competition, allowing better results and performances. Results indicate that both intrinsic and extrinsic motives are related to the wrestler's recovery process, especially on personal and social characteristics. For instance, the intrinsic motivation and personal and social well-being association is $r = .60$, $p = .05$, and the introjected extrinsic motivation and personal acceptance is $r = .66$, $p = .05$. With this study, is possible to better understand wrestlers' motivational patterns and their relationship with recovery processes, which allows coaches to better regulate athletes' feelings of sports adhesion and belonging created within the team regarding their contribution to the recovery process.

Keywords: motivational regulations, Olympic wrestling, recovery

INTRODUCTION

Sports performance is a complex and multidimensional phenomenon since it depends on both personal variables (physical, psychological) of the athlete and contextual variables, like social environment. Sports research has been congruently presenting the impact of athletes' motivation and recovery in the performance in training and competition settings (Ryan & Deci, 2000; Kallus & Kellmann, 2000). However, there is not yet a study focused on the relationship between athletes' motivational regulations and its association to their recovery process in the sports setting. This subject may be important to sport- and wrestling-related research since these two factors are vital to positive and quality sports performances (Ryan & Deci, 2000; Kallus & Kellmann, 2000).

According to Ryan and Deci (2000), motivation is the psychological foundation of human behavior and action, since a motivated individual is someone moved to do something. For instance, a person who feels no impetus or inspiration to act is

characterized as unmotivated; on the contrary, someone who is energized or activated towards an end is considered motivated.

Ryan and Deci (2000) in their Self-Determination Theory argue that motivation exists in a continuum of self-regulatory styles, being measured on quality and not quantitatively, from amotivation to intrinsic motivation. Each regulation is associated with processes regarding personal and contextual variables; in other words, motivation differs qualitatively along a continuum, regarding the relationship of the degree of self-determination or to the extent to which the behavior is regulated by controlling aspects. Also in this human motivation taxonomy, they suggest the importance of perceived locus of causality (Ryan & Deci, 2000).

Regarding sports literature, several studies indicate the importance of psychological factors like motivation, especially intrinsic regulation since it is one variable that differs between successful and unsuccessful athletes both in competitive and participation sport (Sarkar & Fletcher, 2014). Accordingly, Adeyeye, Vipene, and Asak (2013) refer to motivation as a factor that has a direct impact on athletes' level of sports success since it regulates time and effort necessary to obtain goals and to overcome competitive sports challenges. Nevertheless, it is important that in order to maintain a quality and satisfactory motivational regulation and to obtain better results in sports performance, athletes learn how to adapt and regulate their cognitions and emotions (Ryan & Deci, 2000).

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TABLE 1 Correlations Between Recovery Dimensions and Motivational Regulations

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1- PR	13.58	3.17	1.000	–	–	–	–	–	–	–	–	–	–	–	–
2-PSWB	15.16	2.20	.458	1.000	–	–	–	–	–	–	–	–	–	–	–
3-F	13.00	2.25	.499	–.042	1.000	–	–	–	–	–	–	–	–	–	–
4-PA	13.91	2.77	.742**	.378	.409	1.000	–	–	–	–	–	–	–	–	–
5-SR	12.91	2.96	.470	.537	.125	.161	1.000	–	–	–	–	–	–	–	–
6-IM	23.20	2.48	.019	.688*	–.160	.152	–.031	1.000	–	–	–	–	–	–	–
7-IEM	24.30	2.35	.212	–.201	.403	.160	–.494	.088	1.000	–	–	–	–	–	–
8-IntEM	20.70	4.85	.453	.296	.466	.660*	–.393	.394	.414	1.000	–	–	–	–	–
9-EM	14.90	5.06	.147	.438	–.305	.477	.160	.467	.074	.332	1.000	–	–	–	–
10-AMOT	6.90	5.21	–.277	.114	–.137	.150	–.135	.486	–.196	.323	.685*	1.000	–	–	–
11-GR	68.58	9.81	.892**	.652*	.568	.794**	.549	.206	.075	.494	.235	–.113	1.000	–	–
12-EM (uni)	59.90	9.87	.433	.308	.164	.780**	–.297	.464	.449	.804**	.724*	.486	.486	1.000	–
13-Age	16.80	2.65	.524	.239	.511	.370	.336	.108	.185	.327	–.144	–.277	.529	.098	1.000

* $p = .05$. ** $p = .01$.

Note. PR = Physical Recovery, PSWB = Personal and Social Well Being, F = Fitness, PA = Personal Acceptance, SR = Self-Regulation, IM = Intrinsic Motivation, IEM = Identified External Motivation, IntEM = Introjected External Motivation, EM = External Motivation, AMOT = Amotivation, GR = General Recovery, EM (uni) = Extrinsic Motivation (unidimensional).

Therefore, in this article, we try to understand how athletes rationalize their interest, pleasure, and satisfaction and continuously engage in sports participation and competition (Leite, Rosado, & Alves, 2002), and how different motivational regulations are associated with better recovery processes. This may be important since a satisfactory recovery process is helpful in reducing and preventing cognitive–affective negative states that may strain the sports full participation and affect satisfactory performances and positive perceptions regarding sports (Leite et al., 2002).

A deficient recovery process has negative effects on athletes physical, psychological, and social mechanisms, impacting their cognitive and emotional regulations and adaptations during training and competition (Kellmann, 2010; Ryan & Deci, 2000; Standage, Duda, & Ntoumanis, 2003).

Sports psychology- and wrestling-related literature have not yet focused on the relationship between motivational regulations and recovery processes, and such knowledge may be significant since psychological factors depend both on cognitive and emotional adaptations and they affect sports performance (Leite et al., 2002; Ryan & Deci, 2000). In addition, our results may be useful to sports psychologists, coaches, athletes, and other sports professionals to help them build and maintain positive training climates propitious to athletes' success.

Motivation and sports studies began approximately in 1980 with sports participation, which has been a dominant theme in sports psychology ever since. However, in order to understand the motivation, it is more appropriate to see it in terms of perceptions and thoughts instead of an innate quality (Hardwood & Biddle, 2002; Vasconcelos-Raposo, 1996).

Vasconcelos-Raposo (1996) argues that motivation processes have a great impact on athletes' cognitive and emotional regulations towards their behavior in sports. Also,

evidenced-based research focuses on that, in sports, it is the intrinsic motivational regulation that has the most impact on the quality of sports performances, experiences, and athletes' level of involvement in sports since it is derived regarding the focus of interest and perceived factors that may nurture or threaten intrinsic motivation development.

With this we understand that, by studying motivation, it is possible to perceive and explain individuals' differences regarding, for instance, the exhibition of adaptive motivational patterns, where some athletes exhibit positive adaptive motivational patterns where effort is successfully applied to persist in sports, while others give up their sports participation at the first adversities encountered (Steinberg & Maurer, 1999).

In this line of thought, several authors enlightened that both coaches and athletes believed that intrinsic motivation is a key element in the search for spontaneous experiences of satisfaction, pleasure, and challenge and in maintaining good performances and positive sports involvement (Biddle, Chatzisarantis, & Hagger, 2001; Fernandes & Vasconcelos-Raposo, 2004; Fernandes, Vasconcelos-Raposo, Lázaro, & Dosil, 2004; Frederick & Ryan, 1995).

However, Deci and Ryan (1985) warn about this intrinsic–extrinsic dichotomous perspective, stating that it is too simplistic and reductive to understand the motivational process of an individual. The authors suggest a perspective of self-determination, where motivation occurs in a continuum of a more self-determined form to another less self-determined form, that is, intrinsic motivation, extrinsic motivation, and amotivation. Figure 1 displays the continuum defining different levels of self-regulation.

Since the objective of this study is to understand the relationship between wrestlers' motivational regulations and their recovery processes, it is important to address the

Motivational Form	Amotivation		Extrinsic Motivation		Intrinsic Motivation	
Regulatory Styles	Non Regulatory	External	Introjected	Identification	Integration	Intrinsic
Perception locus of causality	Non Personal	External	External/Internal	External/Internal	Internal	Internal
Behavior	Non Self-Determined ←-----→ Self-Determined					
Relevant regulatory process	Absence of: -Competence -Contingence -Intention	Presence of: - External Rewards -Punishments	-Social Aprovation - Ego Involvement	-Activity valorization - Personal Importance	- Consistent/Identified synthesis regulations	-Fun -Pleasure -Satisfaction

FIGURE 1 Description of self-determination continuum and self-regulation levels (Adapted from Ryan & Deci, 2000).

different types of regulations to understand what differs from one another.

According to Vallerand, Deci, and Ryan (1987), intrinsic motivation is characterized by a voluntary participation in an activity with an “apparent” absence of rewards or external pressures and participation in an activity for the interest, satisfaction, and pleasure obtained by the involvement in the activity. The motives are based on fun, pleasure, and satisfaction, usually corresponding to activities considered challenging (Ntoumanis, 2001).

Athletes who participate in sport solely because of interest and desire to learn more and have a self-overcoming perspective are intrinsically motivated (Biddle et al., 2001). In this way, an intrinsically motivated individual performs the activity, if he or she perceives that his or her needs are sufficient when in interaction with the demands of the situation/context; also, it is important to mention that individuals consider their actions to be self-regulated and that the decision comes from their own will. Being intrinsically motivated is an autotelic feeling, that is, the individual perceives self-control, self-determination, and autonomy (Biddle et al., 2001).

On the contrary, external qualities are based on rewards such as money, prizes, or social recognition, reflecting the multidimensionality of extrinsic motives (Ntoumanis, 2001). According to Deci and Ryan (1985), “The extrinsic motivation belongs to a varied range of behaviors that are based on the involvement in the activity as a means to reach an end and not for the activity itself” (p. 137). Also, extrinsic motivation regulations consist of a variety of behaviors in relation to an end, which does not ensure pleasure and satisfaction by and in the activity itself, suggesting that, if rewards and pressures are absent, motivation will be negatively affected due to the lack of intrinsic motives of interest (Biddle et al., 2001).

As mentioned earlier, motivational regulations occur in a continuum perspective, from the most self-determined (intrinsic motivation) to the less self-determined (amotivation). Since, rewards and pressures are a way to control an individual’s autonomy, which does not express their behavior since it is subjugated to control variables, these

extrinsic motives also vary according to the locus of causality (Deci & Ryan, 1985; Fernandes & Vasconcelos-Raposo, 2004).

Biddle et al. (2001) suggest that the most self-determined or more autonomous extrinsic regulation is the integrated extrinsic regulation, where the perception of utility and importance to personal goals is what determines the volition; also, the activities are made by choice. The emphasis of the situation is not limited to the activity itself, and the decision-making process in relation to the behavior is perceived as a global effort that allows one to “harmonize” and to give a base to the coherence of the self-knowledge of the individual itself (Ntoumanis, 2001). Normally, children or adolescents do not usually identify these motifs, so they are rarely used in research at these ages (Pelletier et al., 1995). Also, it is important to acknowledge that Standage et al. (2003) found in their study that this type of regulation did not emerge as a reason for sports participation.

Deci and Ryan (1985) add that, although external motives represent a more integrated and self-determined form of behavior, they must be considered extrinsic since they occur due to personal fulfillment goals and not by the pleasure of engaging in the activity.

Another regulation identified is the extrinsic regulation, which happens when an action or behavior occurs due to the appreciation of the results or benefits of participation in the activity. Sports participation occurs, for example, through the recognition of sports practice and its impact on health, by improving fitness or body image (Biddle et al., 2001). This is a less self-determined form than the previous one, since sometimes, even when internally regulated, it may not be pleasurable or interesting to the individual (Ntoumanis, 2001). Its focus is on the importance of the benefits of the activity itself (weight loss, body image); even when not dependent on external pressures, it happens as a means to an end (Standage et al., 2003).

The perception of athletic involvement is an important factor for their personal development. In sport, identification can occur through the regulated acceptance of behavior due to involvement, which allows some control and perception of the power to choose, even when reasoning is extrinsic

(Deci & Ryan, 1985; Pelletier et al., 1995). According to Biddle, Soos, and Chatzisarantis (1999, p. 84), “it is best reflected in feelings of ‘want’ rather than ‘ought’ or ‘should.’”

Following in the continuum, we find the introjected regulation, which according to Deci and Ryan (1985) is more an affective style than a cognitive one, which involves conflicts of impulses (doing or not doing), resulting in motivated behaviors due to the reinforcement of internal pressures, with guilt or anxiety or a desire to obtain social recognition (Ntoumanis, 2001; Pelletier et al., 1995). No self-determination is observed in this type of behavior; it is a regulatory process based on external sources of control (Standage et al., 2003). Biddle et al. (2001) discuss the term as a fact in which the individual accepts a principle but does not identify with it nor internalize it as his own.

At the other end of the continuum is external regulation, a nonautonomous regulation (Deci & Ryan, 1985), which is the most basic form of extrinsic motivation, encompassing external impositions and contingencies based on rewards or threats. It is a present process in the first years of an individual’s life; this is a term that traditionally reflects the so-called extrinsic motivation as a one-dimensional concept (Ntoumanis, 2001; Standage et al., 2003). Examples in sport can be an athlete practicing sport only to gain recognition from the trainer or to obtain monetary rewards, and so the sporting practice, in this case, is not seen as fun or satisfying but as a way to obtain rewards and/or to avoid negative consequences (Pelletier et al., 1995).

At the “end” of the continuum, we have the amotivation, where behaviors are initiated and regulated by “forces” beyond the intention of controlling the individual, which is considered neither intrinsic nor extrinsic. The individual perceives the absence of contingencies between action and result, and there is no reason to continue the practice (Biddle et al., 2001).

In this sense, we observed that “the study of motivation can be useful and help in predicting lack of persistence in sports or physical activities” (Pelletier et al., 1995, p. 49). It can be also understood that human behavior and motivation are partially regulated by internal structures that evolve with experiences, keeping individuals in a bidirectional relationship with the surrounding context and explaining how an individual’s development occurs through a perspective of differentiation and integration of external stimuli (Coakley & White, 1992; Deci & Ryan, 1985).

As mentioned earlier, sports performance is a complex and multidimensional phenomenon, depending on physical, psychological, and social variables as motivational regulations. Also, since motivation is the foundation of the human motive to act and a deficient recovery process may impact negatively the cognitive–affective structure of the athlete, we understand that a less self-determined motivational regulation may have an impact on the athlete’s recovery process.

According to Kallus and Kellman, (2000) and Leite, Rosado, and Alves (2002), a satisfactory recovery process

helps in reducing and preventing cognitive–affective negative states that may strain the sports performance and experiences, and a deficient recovery process is associated with low performance, overtraining, burnout, and dropout (Dieffenbach & Gould, 2002; Kallus & Kellmann, 2000).

In the early days, athletes’ recovery processes were understood uniquely as an organic process, which had the goal to compensate and reestablish organic *deficits* caused by training loads and by the normal functioning of the athlete’s physiologic system (Kallus & Kellmann, 2000; Kellmann, Kallus, Samulski, Costa, & Simolla, 2009).

Nowadays, recovery appears to be a more complex process, with physiologic, psychological, social, sociocultural, and environmental factors involving simultaneously organic subsystems and the dissociation of different subprocesses (Kallus & Kellmann, 2001; Kellmann, 2010). The same authors state that recovery ends when the previous psychophysiological state before exercise is reestablished, and this can be achieved by intentional actions as active recovery and/or through automatized biopsychological processes where energetic fonts are restored as passive recovery, which is also linked to the quality of sleep and social relationships.

Kallus and Kellmann (2001) define recovery as an intra- and interindividual process associated with psychological, physiological, and social factors that occur over time with the aim of restoring the athlete’s functional capacity. Thus, it is understood that an adequate recovery process aims to eliminate fatigue and to restore vitality in athletes (Ekstedt & Kenttä, 2011), in order to recover from training loads that affect their psychophysiological recovery.

As a result, they are better able to achieve their intended goals and performance through the internalization of their actions and proactive recovery behaviors; that is, athletes who engage actively and systematically with planning and execution of their own recovery actions are able to optimize and better restore the source’s energy, to improve their functional capacity, to train more, and to develop their physical condition and technical efficiency (Kellmann, 2010).

Professionals, coaches, and athletes in the process of detecting recovery states need to be alert to physiological signals; however, it has been shown that psychological indicators are more sensitive and consistent in an early detection of overtraining symptoms or are more complicated or insufficient recovery processes (Kellmann, 2002).

The Recovery Stress Questionnaire-Sport questionnaire is used to evaluate the relationship between stress recovery in athletes, demonstrating if they are physically or psychologically stressed. The instrument is divided into two modules: stress and recovery. The recovery section analyzes behaviors that affect the physiological, psychological, behavioral, social, and environmental components according to the individual needs after a training load (Kallus & Kellmann, 2000). The recovery section was validated and

adapted to the Portuguese sports context by Leite et al. (2002), presenting good psychometric properties.

In conclusion, we understand that in order to obtain better performance and a more positive sports experience, both motivation, especially the more self-determined regulations, and sufficient recovery processes are vital. So, the goal of this study is to understand and explore the relationship between athletes' motivational regulations and its association to their recovery process in a sports setting.

METHOD

Participants

This is a cross-sectional, descriptive, and correlational study, assuming a quantitative methodology. Thirteen Olympic wrestlers from the Portuguese national squad were submitted to the test (cadets: $n = 8$ and juniors: 5; males: $n = 10$ and females: $n = 3$; $M_{age} = 14.66$; $SD = 0.75$; M_{time} of practice = 5.7 years; $SD = 2.09$; $M_{sessions}$ per week = 5.0; $SD = 0.40$).

Instruments

Continuum of Self-Determination

The Continuum of Self-Determination was used to evaluate the motivational regulations in sport, adapted and validated for the Portuguese sports context by Fernandes and Vasconcelos-Raposo (2005) from the continuum developed by Deci and Ryan (1985). The scale is composed of 16 items, starting with "I perform training ..." and evaluates with a Likert-type scale where 1 equals "I fully disagree" and 7 equals "I fully agree" the regulatory dimensions of (a) Intrinsic Motivation ($\alpha = .37$), (b) Identified External Motivation ($\alpha = .63$), (c) Introjected External Motivation ($\alpha = .76$), (d) External Motivation ($\alpha = .65$), and (e) Amotivation ($\alpha = .90$). The values of α presented are for the study sample and show an adequate internal consistency.

Subjective Scale of Recovery for Sport

The Subjective Scale of Recovery for Sport was used to evaluate the recovery of the athletes and was adapted and validated for the Portuguese sport context by the RESTQ-Sport Recovery Module 76, originally created by Kallus and Kellmann (2000). The scale consists of 16 items, starting with "In the last three days/nights" and evaluates with a Likert-type scale where 0 equals "Never" and 6 equals "Always." It evaluates the following five variables as first-order factors: (a) Physical Recovery ($\alpha = .92$) gathers the recovery in the physiological scope or in the scope of physical fitness; (b) Personal and Social Well-Being ($\alpha = .78$) measures the occurrence of good mood, general relaxation, and contentment with the occurrence of pleasurable social contacts and changes combined with relaxation

and fun; (c) Being in Shape ($\alpha = .50$) is a subjective perception scale of the level of performance and vitality; (d) Personal Acceptance ($\alpha = .89$) evaluates appreciation and empathy with the team and the accomplishment of personal goals of sport; and (e) self-regulation ($\alpha = .86$) refers to the training of psychological skills during preparation for competitions/training. The values of α presented are for the study sample and show an adequate internal consistency.

Procedures

We first asked for authorization from the Portuguese Wrestling Federation to conduct the study, and, after acceptance, contact was established with the trainers present in a competition. Second, athletes were informed of the purpose of the study and their participation was requested after a brief explanation and separated to assure the trustworthiness of their responses. After signing the informed consent and being informed how to fill out the questionnaire individually, questionnaires were delivered to the athletes. The maximum filling time was 6 minutes, and response changes were not allowed; when in doubt, athletes would raise their hand and wait for the researcher to come by and clarify the question. A total of 13 questionnaires were collected.

Data Analysis

In the first set of analyses the demographic data were descriptively analyzed. Subsequently, the univariate analysis of measures of central tendency (mean), measures of dispersion (standard deviation), skewness and kurtosis were used to analyze the correlations between variables (intensity of the relation between variables) or Spearman's Rho. The level of significance adopted to reject the null hypotheses was $p < .05$. All statistical analyses were carried out using SPSS (Statistical Package for Social Sciences, Version 20, IBM Corp., Armonk, NY, USA).

RESULTS

The results obtained regarding the association of both constructs of Motivational Regulations and Recovery dimensions (Table 1) indicate that Intrinsic Motivation is associated with personal and social well-being ($r = .69$; $p = .05$). Introjected External Motivational regulation is related to Personal Acceptance ($r = .66$; $p = .05$). Also, Extrinsic Motivation (Unidimensional) is associated with Personal acceptance ($r = .78$; $p = .01$). Regarding the results within dimensions of the Self-Determination Continuum, results indicate an association between the Unidimensional External Motivation with the Introjected External Motivational Regulation and External Motivation Regulation ($r = .80$; $p = .01$) ($r = .72$; $p = .05$). Also, the

association between extrinsic motivation and amotivation was ($r = .68$; $p = .05$). Regarding the results within the several dimensions of Recovery, results indicate that Personal acceptance is associated with Physical Recovery ($r = .74$; $p = .01$) and General Recovery ($r = .79$; $p = .01$). Also, Physical Recovery and General Recovery are associated ($r = .89$; $p = .01$). Finally, Social and Personal Well-Being are associated with General Recovery ($r = .65$; $p = .05$).

DISCUSSION

With this study, we aimed to explore and understand the relationship between different motivational regulations according to the Self-Determination Continuum and their association to Portuguese wrestlers' recoveries as a bio-psycho-social process. However, to display our conclusions, it is important to first acknowledge some limitations of this study. First, this is the first study that attempts to understand the relationship between the constructs of motivation and recovery in sports, which does not allow previous comparisons with other literature. Also as a correlational study with a small sample, it is not possible to extrapolate results to the general sports community, to the general wrestling community, or to differences between gender and age groups. However, it may enlighten some relationships between the constructs, keeping in mind that it only indicates possible relationships between variables and does not indicate how this relationship operates, and it can fail to indicate if the observed values are due to other variables not considered in the study.

The first general conclusions of this study indicate that, in fact, some relationships may exist between motivational regulations and wrestlers' recovery processes. Also, the results reinforce that less self-determined motivational regulations or extrinsic regulations are associated with each other, corroborating Ryan and Deci (2000) Self-Determination Theory where extrinsic and intrinsic motivations are always interconnected, forcing the individuals to act in regards to their motives and needs according to the context. In the same way, our results allow an understanding of athletes' recovery processes as bio-psycho-social processes, corroborating Leite et al. (2002). More specifically, the results indicate a plausible relationship between intrinsic and extrinsic motivations and athletes' recovery processes, especially in psychological and social dimensions of recovery, showing that, in fact, an inadequate recovery process may have negative impact on athletes' cognitive and affective structures and may impact their psychological functioning, performance and sports continuity, and their ability to regulate their motivation (Leite et al., 2002).

As the first result, this study indicates a positive association between intrinsic motivation regulation and the recovery process dimension of personal and social well-being. Such results indicate that wrestlers with intrinsic regulations that practice wrestling in a voluntary, interesting, satisfying,

and pleasurable way with motives such as fun, satisfaction, and overcoming challenges may, in fact, benefit during their recovery process with feelings of good humor, general relaxation, and contentment through pleasurable social contacts inside and outside the team. In the same line, Ntoumanis (2001) mentions that intrinsically motivated athletes are more eager to learn, commit, apply effort and persist during their sports careers.

So with this it may be important for coaches to focus on creating training and competition climates that promote intrinsic motivations for wrestling participation, since it may allow wrestlers and the entire team to better recover mainly through personal and social well-being experiences inside and outside of the team (Goudas, Dermitzaki, & Bagiatis, 2000, 2001). Concomitantly, it is important to acknowledge that intrinsically regulated athletes are more eager to learn about one's own personal recovery process by developing autonomous and proactive behaviors and to transfer them to other team elements, since, despite being an individual sport, wrestlers are very dependent on team relations. Certainly, a more recovered team has more chances to obtain better levels of performance in training and competition. The fact that intrinsic motivations are associated with the personal and social well-being dimensions reinforces the concept of recovery as a process far beyond biological processes as advocated by Kallus and Kellmann (2001).

The second result of this study demonstrates that the introjected motivational regulation is associated with the personal acceptance dimension of recovery. Such results may suggest that wrestlers with this affective style during their sports participation may be motivated by internal conflicts of impulse (doing or not doing), which results in behaviors reinforced by internal pressures, such as guilt, anxiety, or desire to obtain social recognition (Ntoumanis, 2001; Pelletier et al., 1995), and that to recover, these athletes need perceptions of appreciation and empathy within the team over the achievement of personal goals in the sport. With this result, it is important to account that, since it is not a self-determined behavior, the motivational regulatory process towards recovery is based on external sources of control. This shows that individuals accept a principle but do not identify with it nor internalize it as one's own, which may expose athletes to higher levels of anxiety when interacting with their personal acceptance, affecting their recovery and sports performance (Biddle et al., 2001; Pelletier et al., 1995; Standage et al., 2003).

The third result of this study indicates an association regarding External Motivation and Personal Acceptance, which allows one to understand that a variety of behaviors towards recovery that are based on the involvement in the activity as a means to reach an end and not the activity itself exists (Ryan & Deci, 2000). Such results may also indicate that athletes during their training are only motivated to recover in order to obtain a

better performance in training or competition. Nevertheless, since within recovery dimensions personal acceptance and general recovery are associated, this may permit us to suggest that motivation and recovery are processes with psychological and self-knowledge characteristics that allow athletes a more positive personal and social perceptions of their ability to restore their functional levels, especially within the action of the team.

Other results of this study indicate the association between extrinsically regulated motivation and amotivation, reinforcing the contribution of some researchers where external motives are linked to manipulated behaviors that have negative impacts on the athlete's motivation, which can result in dropout, burnout or demotivation states that may jeopardize the athlete's recovery process, performance, sporting experience, and continuity in sport (Ryan & Deci, 2000; Standage et al., 2003).

In conclusion, this study emphasizes the relationship between intrinsic and extrinsic motivations towards a behavior, that is, recovery. More specifically, it is possible to understand that different motivational regulations have different impacts on the recovery process of the athletes. Also, this study ensures that recovery is an intra- and interindividual process dependent on psychological, physiological, and social factors in wrestlers (Kallus & Kellmann, 2001). As the first study regarding motivational regulations and recovery in wrestlers, many questions remain open; however, we can observe that intrinsic motives allow wrestlers to increase one's feelings of pleasure and interest, can challenge one in training and competition, and can increase their ability to become autonomous in this type of behavior and in the ability to transfer such practices to other team members through the sharing of their internalization of values and behaviors where athletes actively participate in their recovery process. Finally, the practical implications of this study allow coaches and athletes to perceive the motivational patterns and their impact on the levels of adhesion and belonging to the group, being this is particularly important in wrestling since, even though it is an individual sport, athletes are very dependent on the relations established within the group.

REFERENCES

- Adeyeye, F., Vipene, J., & Asak, D. (2013). The impact of motivation on athletic achievement: A case study of the 18th national sports festival Lagos, Nigeria. *Academic Research International*, 4(5), 378–383.
- Biddle, S., Chatzisarantis, N., & Hagger, M. (2001). Self-determination theory in sport and exercise. In F. Cury, P. Sarrazin, & J. P. Famose (Eds.), *Theories de la motivation et sport: Etats de la Recherche* (pp. 17–55). Paris, France: Presses Universitaires de France.
- Biddle, S., Soos, I., & Chatzisarantis, N. (1999). Predicting physical activity intentions using goal perspectives and self-determination theory approaches. *European Psychologist*, 4(2), 83–89. doi:10.1027//1016-9040.4.4.83
- Coakley, J., & White, A. (1992). Making decisions: Gender and sport participation among British adolescents. *Sociology of Sport Journal*, 9, 20–35. doi:10.1123/ssj.9.1.20
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York, NY: Plenum.
- Dieffenbach, K., & Gould, D. (2002). Psychological issues in youth sports: Competitive anxiety, overtraining, and burnout. In R. Malina & M. Clark (Eds.), *Youth sports in the 21st century: Organised sports in the lives of children and adolescents*. East Lansing, MI: Exercise Science.
- Ekstedt, M., & Kenttä, G. (2011). Återhämtning självklart för elitidrottare ... men inte för yrkesarbetare [Recovery course for athletes ... but not for professional workers]. *Läkartidningen*, 108, 1684–1687.
- Fernandes, H., & Vasconcelos-Raposo, J. (2004). A teoria da auto-determinação no contexto desportivo [Dossier] [Self-determination theory in the sport context]. *Horizonte*, 19, 114.
- Fernandes, H., & Vasconcelos-Raposo, J. (2005). Continuum of Self-Determination: Validity for its application in sports context. *Estudos De Psicologia*, 10, 385–395. doi:10.1590/S1413-294X2005000300007
- Fernandes, H., Vasconcelos-Raposo, J., Lázaro, J. P., & Dosal, J. (2004). Validación e aplicación de modelos teóricos motivacionales en el contexto de la educación física [Validation and application of theoretical motivational models in the physical education context]. *Cuadernos De Psicología Del Deporte*, 4(1/2), 67–89.
- Frederick, C., & Ryan, R. (1995). Self-determination in sport: A review using cognitive evaluation theory. *International Journal of Sport Psychology*, 26, 5–23.
- Goudas, M., Dermitzaki, I., & Bagiatas, K. (2000). Predictors of student's intrinsic motivation in school physical education. *European Journal of Psychology of Education*, 15(3), 271–280. doi:10.1007/BF03173179
- Goudas, M., Dermitzaki, I., & Bagiatas, K. (2001). Motivation in physical education is correlated with participation in sport after school. *Psychological Reports*, 88, 491–496. doi:10.2466/pr0.2001.88.2.491
- Harwood, C., & Biddle, S. (2002). The application of achievement goal theory in youth sport. In I. Cockerill (Ed.), *Solutions in sport psychology* (pp. 58–73). London, UK: International Thomson Business.
- Kallus, K. W., & Kellmann, M. (2000). Burnout in athletes and coaches. In Y. L. Hanin (Ed.), *Emotions in sport* (pp. 209–230). Champaign, IL: Human Kinetics.
- Kallus, K. W., & Kellmann, M. (2001). Recovery Stress Questionnaire for Athletes. In *Revista Portuguesa de Fisioterapia no Desporto*, 7 (1-24) *User manual*. Champaign, IL: Human Kinetics.
- Kellmann, M. (2002). *Enhancing recovery: Preventing underperformance in athletes*. Champaign, IL: Human Kinetics.
- Kellmann, M. (2010). Preventing overtraining in athletes in high-intensity sports and stress/recovery monitoring. *Scandinavian Journal of Medicine and Science in Sports*, 20, 95–102. doi:10.1111/j.1600-0838.2010.01192.x
- Kellmann, M., Kallus, W. K., Samulski, D. M., Costa, L. O. P., & Simolla, R. A. (2009). P. Questionário De Stress E Recuperação Para Atletas (Restq-76 Sport): Manual Do Usuário. Belo Horizonte: Escola De Educação Física. Fisioterapia E Terapia Ocupacional.
- Leite, A., Rosado, A., & Alves, F. (2002). Subjective recovery: Validation of Subjective Recovery Scale for Sports (SRSS). *Revista Portuguesa De Fisioterapia No Desporto*, 7(1), 15–28.
- Ntoumanis, N. (2001). A self-determination approach to the understanding of motivation in physical education. *British Journal of Educational Psychology*, 71, 225–242. doi:10.1348/000709901158497
- Pelletier, L., Fortier, M., Vallerand, R., Tuson, K., Brière, N., & Blais, M. (1995). Toward a new measure of intrinsic motivation, extrinsic motivation and amotivation in sports: The Sport Motivation Scale (SMS). *Journal of Sport & Exercise Psychology*, 17, 35–53. doi:10.1123/jsep.17.1.35

- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development and well-being. *American Psychologist*, *55*, 68–78. doi:10.1037/0003-066X.55.1.68
- Sarkar, M., & Fletcher, D. (2014). Psychological resilience in sport performers: A review of stressors and protective factors. *Journal of Sports Sciences*, *32*(15), 1419–1434.
- Standage, M., Duda, J. L., & Ntoumanis, N. (2003). A model of contextual motivation in physical education: Using constructs from self-determination and achievement goal theories to predict physical activity intentions. *Journal of Educational Psychology*, *95*(1), 1–15. doi:10.1037/0022-0663.95.1.97
- Steinberg, G. M., & Maurer, M. (1999). Multiple goal strategy: Theoretical implications and practical approaches for motor skill instruction. *Journal of Physical Education, Recreation and Dance*, *70*(2), 61–65. doi:10.1080/07303084.1999.10605667
- Vallerand, R. J., Deci, E. L., & Ryan, R. M. (1987). Intrinsic motivation in sport. In K. B. Pandolf (Eds.), *Exercise and sport sciences reviews* (Vol. 15, pp. 389–425). New York, NY: MacMillan.
- Vasconcelos-Raposo, J. (1996). Sports Psychology: Pass, present and future. In J. Cruz (Eds.), *Sports psychology manual* (pp. 43–65). Braga, Portugal: Editions SHO.