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Motivación e intención de permanecer en el entrenamiento de natación durante una temporada competitiva: una comparación entre grupos de edad

Motivation and intention to remain in swimming training throughout a competitive season: an age-group comparison

Motivação e intenção em permanecer no treino de natação ao longo de uma época competitiva: uma comparação entre escalões etários

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RESUMEN

El presente estudio buscó analizar las variaciones en la regulación motivacional y la intención de continuar en el entrenamiento de natación a lo largo de una temporada competitiva, en función de la edad. Participaron 154 nadadores federados, agrupados en categorías infantil, juvenil, júnior y sénior. La recogida de datos se realizó en tres momentos diferentes de la temporada (diciembre, marzo y junio), utilizando el Cuestionario de Regulación Conductual en el Deporte y tres ítems específicos de intención. Los resultados mostraron que los nadadores más jóvenes mantuvieron altos niveles de motivación autodeterminada, mientras que los grupos juvenil y júnior presentaron mayores fluctuaciones motivacionales y un descenso progresivo en la intención. En contraste, los nadadores sénior manifestaron un incremento en la motivación controlada y una mayor intención de continuar. Estos hallazgos sugieren que la motivación y la intención en la práctica deportiva evolucionan de forma diferenciada según la edad, lo que subraya la necesidad de adaptar las estrategias motivacionales a cada etapa del desarrollo deportivo.

Palabras clave: Motivación autodeterminada, intención, natación, regulación motivacional.

ABSTRACT

This study aimed to examine variations in motivational regulation and the intention to remain in swimming training across a competitive season, considering different age groups. A total of 154 competitive swimmers participated and were categorised as young, youth, junior and senior. Data were collected at three points during the 2023–2024 season (December, March and June), using the Behavioral Regulation Sport Questionnaire and specific intention

items. Results indicated that younger swimmers maintained higher levels of self-determined motivation throughout the season, whereas youth and junior groups experienced greater motivational shifts and a decrease in intention. Interestingly, senior swimmers reported higher levels of controlled motivation, along with increased intention to remain. These findings suggest that both motivation and intention to continue training are age-dependent, emphasizing the importance of age-sensitive strategies to support sustained engagement in competitive swimming.

Keywords: Self-determined motivation, intention, swimming, motivational regulation.

RESUMO

Este estudo objetivou analisar as variações na regulação motivacional e na intenção de permanecer no treino de natação ao longo de uma época competitiva, em diferentes grupos etários. Participaram 154 nadadores federados, divididos em quatro escalões: jovens, juvenis, juniores e seniores. A recolha de dados ocorreu em três momentos da época desportiva (dezembro, março e junho), através do Questionário de Regulação Comportamental no Desporto e de itens específicos de intenção. Os resultados revelaram padrões distintos entre os grupos: os mais jovens mantiveram elevados níveis de motivação autodeterminada, enquanto os juvenis e juniores apresentaram flutuações nas formas de motivação e declínio na intenção. Por outro lado, os seniores demonstraram maior motivação controlada, associada a um aumento na intenção de permanecer. As diferenças observadas sugerem que a motivação e a intenção para a prática desportiva evoluem com a idade, sendo necessário considerar estratégias específicas para promover o envolvimento sustentado no treino.

Palavras chave: Motivação autodeterminada, intenção, natação, regulação motivacional.

INTRODUCTION

Swimming is among the most well-known and widely practiced sports in the world. One of the main reasons for its high participation rates is that it can be performed at any age, attracting swimmers across all stages of life (Dunder, 2004). Therefore, assessing and monitoring the motivational levels of individuals during lifespan is extremely important for the continuous development of the sport, particularly in the pursuit of high performance and improved results on the global stage (Monteiro et al., 2017; Monteiro et al., 2018).

Human motivation is directly linked to an individual's development and functioning in society, and has been recognized as a key condition for achieving success and improving performance outcomes (Deci & Ryan, 2000). It is the process by which a person determines their goals, uses appropriate resources and maintains a specific behavior with the purpose of achieving a desired outcome. Motivation has been widely studied by researchers due to its importance in understanding athlete behavior and its critical role in sustaining sport participation (Monteiro et al., 2018). Many of these studies aim to achieve high performance through statistical analyses of psychological and physiological factors (Silva, 2020), evolving from more descriptive approaches to more complex theoretical frameworks. These theories primarily seek to identify the factors associated with sport-related behaviors from a multidisciplinary perspective (Ntoumanis & Biddle, 1999). As a result, the number of specialists in this field has been growing, with the intention of studying motivation also within the domains of exercise and physical activity.

Despite the theoretical diversity in studies related to motivation, there are models that facilitate the understanding of the concept within sport and physical activity, as these are seen as important factors influencing athletes' decisions to continue or drop out of their chosen discipline (Monteiro et al., 2018). Over the years, numerous theories have been developed regarding human motivation, among which the Self-Determination Theory in particular stands out (Ntoumanis et al., 2017). These and other works have contributed to and supported the study and exploration of factors involved in sport motivation, as well as in related domains (Hellín, 2007). Self-Determination Theory (SDT) provides a comprehensive framework for understanding the quality of motivation in sport. According to Deci and Ryan (2000; Ryan & Deci, 2017), motivation lies on a continuum ranging from amotivation, through controlled forms such as external and introjected regulation, to more autonomous forms such as identified, integrated, and intrinsic motivation. Central to SDT is the satisfaction of three basic psychological needs—autonomy, competence, and relatedness—which are essential for the development of self-determined

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motivation and optimal functioning. When these needs are supported in sport contexts, athletes are more likely to internalize external regulations, fostering autonomous motivation and enhancing both persistence and performance (Vallerand, 2007; Hagger & Chatzisarantis, 2007). This framework is particularly relevant in swimming, where the continuous and demanding nature of training requires long-term commitment. By emphasizing the role of SDT, the present study underscores the importance of examining how different forms of motivational regulation influence athletes' intentions to remain engaged throughout the season.

Another highly important factor related to motivation is the intention to remain engaged in sport practice, which often reflects athletes' commitment to their sporting careers. According to Ajzen (1991), through the Theory of Planned Behavior (TPB), an individual's intention to perform a behavior is the best predictor of that behavior. This intention is influenced by three main components: attitudes, subjective norms and perceived behavioral control. In this regard, Papaioannou (1998) states that actions related to physical exercise can influence athletes' motivation, with sport participation showing a positive relation with intentions to engage in physical activity (Standage et al., 2003). In sports, this means that the intention to continue sports practice is a strong predictor of long-term retention (Monteiro et al., 2018).

According to Weinberg and Gould (2011), motivation influences the initiation, maintenance and intensity of sport behavior. It is essential to emphasize that the relationship between the forms of motivational regulation and intention is a significant topic in sport psychology, especially within the framework of Self-Determination Theory (SDT) and the Theory of Planned Behavior (TPB). This relationship is complex and multidimensional, as it involves many internal and external factors that can influence the athlete either positively or negatively (Hagger & Chatzisarantis, 2007). Athletes who exhibit high levels of self-determined motivation are more likely to display stronger intentions to engage in sport, which in turn increases the likelihood of sustained participation and commitment (Chatzisarantis et al., 2003).

Empirical findings indicate that self-determined motivation enhances intention formation by influencing core TPB constructs attitudes, subjective norms and perceived behavioral control (Hagger et al., 2002). Furthermore, the internalization of external regulations through social support and value alignment facilitates the transition from controlled to autonomous motivation, thereby reinforcing the motivational foundation for sustained sport participation (Vallerand & Rousseau, 2001; Pelletier et al., 2001). Previous studies in swimming reported dropout rates and clarified the reasons for dropout in different stages of the swimmers' careers (Monteiro et al., 2017). However, it remains unclear how motivation and intention to remain in training vary over a competitive season. Moreover, the way swimmers are motivated and are involved in the training context is expected to differ across their careers. So, it is crucial to understand how those psychological measures may differ across age groups and deliver tailored strategies when appropriate.

This study aimed to analyze the variations in swimmers' motivation regulation and intention throughout a competitive season in different age groups. It was hypothesized that throughout a competitive season: (i) self-determined motivation will remain stable or decrease slightly in younger swimmers; (ii) youth and junior athletes will experience greater fluctuations in motivational regulation marked by a rise in controlled motivation and a decline in intention to continue training; (iii) senior swimmers would show an increase in controlled forms of motivation (e.g., introjected and external regulation) accompanied by higher intention to remain in training.

MATERIAL AND METHODS

Research design

This study employed an cuasi-experimental longitudinal research design with repeated measures (Ato, López & Benavente, 2013). This type of design allows to analyze the effects between the variables and how those, either isolated (i.e., bivariate analysis) or in combination (i.e., multivariate analysis), evolve over time (Costa et al., 2012). The research followed structured observational methods and applied validated questionnaires to monitor motivation and intention across three different time points during a competitive season.

Participants

Sample size and power calculations were conducted a priori using G*Power (v.3.1.9.7) (Faul et al., 2007). Considering the analysis to be performed on the primary outcomes, a between-within repeated measures ANOVA (4 [groups] x 3 [time points]), with an anticipated "large" effect size ($f = 0.4$), $\alpha = 0.05$, a statistical power of $(1 - \beta) = 0.95$, dependent variables correlated with $r = 0.50$ and a violation of sphericity (ϵ) = 0.80, indicated a minimum sample size of 24 individuals to be recruited. The suggested effect size and the remaining parameters were defined according to similar studies that assessed the variables under study over time (e.g., Gucciardi & Jackson, 2015).

Inclusion criteria were defined as: (i) be a swimmer affiliated with the National Swimming Federation during the 2023-2024 season; (ii) take part in the three time points of evaluation. A total of 154 swimmers (82 females and 72 males) were recruited from five clubs from the northern region of Portugal (Table 1). The swimmers were then divided by age groups according to official federation categories as young ($n = 49$, 11.7 ± 0.8 years), youth ($n = 42$, 13.7 ± 0.7 years), junior ($n = 33$, 15.4 ± 0.8 years) and senior ($n = 30$, 19.5 ± 2 years). All swimmers and their legal representatives were previously informed about the data collection procedures and signed an informed consent form. All procedures were approved by the institutional Ethics Committee conducted in accordance with the principles outlined in the Helsinki Declaration with the ethical standards in Sport and Exercise Science Research (Harriss et al., 2019). The study adhered to the provisions of Organic Law 3/2018, of December 5, on Personal Data Protection and Guarantee of Digital Rights, ensuring compliance with data protection regulations.

Table 1. Swimmers' distribution by club, age group and sex.

	young	youth	junior	senior
<i>Females</i>				
Club 1	0	7	3	3
Club 2	6	6	3	4
Club 3	5	4	3	1
Club 4	4	3	2	0
Club 5	8	1	10	9
<i>Males</i>				
Club 1	0	4	4	3
Club 2	14	2	6	2
Club 3	4	1	5	3
Club 4	4	3	3	1
Club 5	4	2	4	3
Total	49	33	43	29

Instruments

The Behavioral Regulation Sport Questionnaire BRSQ (Monteiro et al., 2018; Monteiro et al., 2019) was used to assess motivation, consisting of 24 items, to which respondents answer using a seven-point Likert scale, ranging from 1 ("strongly disagree") to 7 ("strongly agree"). The items are then grouped into six factors that reflect the different forms of behavioral regulation underlying the theoretical framework of Self-Determination Theory, particularly the Organismic Integration Theory (Ryan & Deci, 2017). Cronbach's alpha coefficients indicated good internal consistency across the subscales: amotivation ($\alpha = .81$), external regulation ($\alpha = .79$), introjected regulation ($\alpha = .76$), identified regulation ($\alpha = .84$), integrated regulation ($\alpha = .86$), and intrinsic motivation ($\alpha = .88$).

To assess intention, three specific items were created according to Ajzen's (2006) recommendations (e.g. "I intend to continue practicing federated swimming next season, in the same way, with the same type, frequency, duration and intensity of training and competition"). A five-point Likert scale was used, ranging from 1 ("no, for sure") to 5 ("yes, for sure"). Similar procedures have been used in other studies to measure and analyze motivation and

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intention in athletes (e.g., Guzmán & Kingston, 2012). Cronbach's alpha coefficients indicated good internal consistency for intention ($\alpha = .92$).

Procedures

Data collection was carried out at three different time points throughout the 2023-2024 competitive season, near the end of each of the three training macrocycles, specifically in December, March and June. At each moment, the swimmers were assessed in terms of motivation regulation and intention to remain in swimming training. The date and time for the visits were initially scheduled with the coaches responsible for the swimmers. Then, each individual was given a sheet containing their identification header and the questionnaires to complete. All questionnaires were filled out before the training sessions to avoid affecting the regular training routine. One investigator ensured the anonymity and integrity of the process, namely the questionnaire's application providing minimal assistance to avoid influencing the reliability of data collection. Once the responses were completed, each individual was marked as "completed" on a separate attendance sheet.

Statistical analysis

Normality and homoscedasticity were verified using the Kolmogorov-Smirnov test ($n > 50$) and Levene's test, respectively. A repeated measures ANOVA with a within-between design (4 [groups] x 3 [time points]) was conducted to assess differences between dependent variables. The assumptions of sphericity were examined using Mauchly's test. When this assumption was not met, the adjusted Greenhouse-Geisser values and degrees of freedom were reported (Ho, 2014), indicated by the presence of decimal degrees of freedom. The repeated measures analyses were followed by post-hoc Bonferroni-adjusted tests to analyze pairwise comparisons. Effect size was calculated using partial eta squared (η^2) and interpreted as follows: "small" effect = 0.01, "medium" effect = 0.06 and "large" effect = 0.14 (Cohen, 1988). All statistical analyses were conducted using SPSS software, version 27 (IBM, SPSS Inc., Chicago, IL, United States) and the significant cut-off value was set at 5%.

RESULTS

Table 2 shows the descriptive values for the variables of motivation regulation and intention at the three time points during the competitive season. In the young cohort, there was a decrease in the less self-determined forms of motivation (i.e., amotivation, external regulation and introjected regulation), while the more self-determined forms of motivation remained consistent across time points. In addition, a decrease was observed in the intention to continue practicing swimming throughout the season. Regarding the youth, an increase in the less self-determined forms of motivation and a decrease in the more self-determined forms of motivation, as well as in the intention to continue practicing swimming were observed. In the case of the junior, both less self-determined and more self-determined forms of regulation increased, with a noticeable decrease in the intention to continue practicing swimming. Finally, in the senior category, there was an increase in less self-determined forms of motivation and a decrease in more self-determined forms of motivation, along with an increase in the intention to continue practicing swimming.

Table 2. Descriptive values of motivation regulation and intention at the three time points during the competitive season.

	December	March	June
<i>Young</i>			
Amotivation	1.80±1.06	2.01±0.12	1.77±1.02
External Regulation	1.70±1.22	1.64±0.94	1.75±1.18
Introjected Regulation	2.07±1.27	1.93±1.09	2.05±1.29
Identified Regulation	5.60±1.02	5.46±1.22	5.35±1.27
Integrated Regulation	6.12±0.89	6.02±0.91	5.85±0.93
Intrinsic Motivation	6.60±0.68	6.53±0.55	6.13±0.86
Intention	4.51±0.69	4.22±1.01	4.28±0.91
<i>Youth</i>			
Amotivation	2.65±1.24	2.62±1.49	2.79±1.40
External Regulation	1.74±1.17	1.71±0.95	1.93±1.02
Introjected Regulation	2.19±1.27	2.09±1.19	2.13±1.05
Identified Regulation	5.74±0.84	5.52±1.46	5.57±1.19
Integrated Regulation	5.76±1.21	5.64±1.26	5.45±1.34
Intrinsic Motivation	5.99±0.89	5.95±1.05	5.76±1.06
Intention	4.52±0.65	4.41±0.84	4.33±0.76
<i>Junior</i>			
Amotivation	2.84±1.29	3.21±1.47	3.19±1.26
External Regulation	1.67±0.81	1.70±0.81	2.12±1.14
Introjected Regulation	2.05±1.07	2.33±1.39	2.88±1.56
Identified Regulation	5.42±1.16	5.43±1.07	5.26±1.24
Integrated Regulation	5.58±1.05	5.52±1.06	5.26±0.98
Intrinsic Motivation	5.68±0.91	5.87±1.12	5.47±0.96
Intention	4.52±0.60	4.29±0.77	4.01±0.81
<i>Senior</i>			
Amotivation	3.22±1.24	3.22±1.31	2.90±1.51
External Regulation	1.89±0.85	2.45±1.71	2.01±0.88
Introjected Regulation	2.40±1.31	2.56±1.24	2.34±1.25
Identified Regulation	5.69±0.69	5.39±0.70	5.51±0.75
Integrated Regulation	5.43±0.91	5.44±0.80	5.28±0.88
Intrinsic Motivation	5.65±0.88	5.43±0.66	5.55±0.78
Intention	3.53±1.10	3.46±0.98	3.82±0.87

Table 3 presents the inferential analysis between groups, moments and the interaction between time and group for the variables of motivation regulation and intention to continue in swimming training. Overall, there are no differences between groups, time points or the interaction for external, identified and integrated regulations. On the other hand, intention differed between groups, with juniors having a higher intention to remain in training than seniors. Likewise, amotivation differed between groups, with seniors showing higher values than the young group. An interaction between time and group was observed in introjected regulation, particularly among young and juniors between time points one and three. Finally, regarding intrinsic motivation, the results revealed differences across all groups, with the young group showing the highest values across all three moments.

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Table 3. Inferential analysis between groups, moments and the interaction between time and group for the variables of motivation regulation and intention to continue in swimming training.

	Mean Square	F	GL1	GL2	p	η_p^2	Comparisons
<i>Amotivation</i>							
Time	0.56	0.78	2	30	0.47	0.05	ns
Group	14.70	3.80	3	45	0.02	0.20	1 \neq 2
Time*Group	0.44	0.70	6	90	0.65	0.05	ns
<i>External Regulation</i>							
Time	0.66	0.85	2	30	0.44	0.05	ns
Group	4.88	2.10	3	45	0.11	0.12	ns
Time*Group	1.24	1.24	6	90	0.07	0.12	ns
<i>Introjected Regulation</i>							
Time	0.48	0.64	2	30	0.54	0.04	ns
Group	3.53	1.06	3	45	0.38	0.07	ns
Time*Group	1.57	2.74	6	90	0.02	0.15	1 \neq 3
<i>Identified Regulation</i>							
Time	0.09	0.17	2	30	0.85	0.01	ns
Group	0.11	0.04	3	45	0.99	0.00	ns
Time*Group	0.50	0.69	6	90	0.66	0.00	ns
<i>Integrated Regulation</i>							
Time	1.48	2.91	2	30	0.07	0.16	ns
Group	5.52	2.56	3	45	0.07	0.15	ns
Time*Group	0.57	1.04	6	90	0.41	0.07	ns
<i>Intrinsic Motivation</i>							
Time	0.51	1.64	2	30	0.21	0.10	ns
Group	7.86	5.33	3	45	0.00	0.26	1 \neq 2;3;4
Time*Group	0.46	0.26	6	90	0.36	0.07	ns
<i>Intention</i>							
Time	1.05	3.16	2	30	0.06	0.17	ns
Group	4.72	3.45	3	45	0.02	0.19	3 \neq 4
Time*Group	0.60	1.78	6	90	0.11	0.11	ns

F, test results; GL1, degrees of freedom of time, group and group-time; GL2, degrees of freedom of time, group and group-time; p, significance; η_p^2 , partial Eta-squared; ns, non-observed differences; 1, young; 2, youth; 3, junior; 4, senior.

DISCUSSION

The aim of this study was to analyze the variations in motivation regulation and intention throughout a competitive season in swimmers of different age groups. Athletes' motivation and intention to engage in sport can vary significantly over time, influenced by both internal and external factors (Ryan & Deci, 2000). In the case of swimming, these fluctuations are particularly interesting and complex due to the sport's unique characteristics, which encompasses high levels of dedication and self-discipline (Pelka et al., 2017). Some studies with swimmers indicate that intrinsic motivation tends to be higher in this context and is associated with better performance and long-term sport satisfaction (Pelletier et al., 1995). For instance, athletes who are motivated by the pleasure of swimming or the satisfaction of improving their skills generally show greater persistence and resilience, which in turn enhances their intention to continue training (Pelletier et al., 2001). Indeed, athletes may experience significant changes in motivation and intention throughout their competitive careers. Longitudinal studies suggest that young athletes typically begin their journey with higher levels of intrinsic motivation; however, over time, various factors such as increased performance pressure and physical fatigue may shift their motivation toward more extrinsic

forms (Martens, 2004). To prevent this shift, a deeper understanding of how intrinsic motivation and intention evolve throughout specific training seasons is needed to support those who interact with swimmers over time.

Variation in motivation across the season

The results revealed a decrease in less self-determined forms of motivation among swimmers in the youngest age category, while more self-determined forms remained stable across time. The reduction in less self-determined regulations, such as amotivation, external regulation and introjected regulation, is particularly relevant in sport settings, as these forms of motivation are frequently linked to negative outcomes such as dropout and burnout (Deci & Ryan, 2000). Conversely, the maintenance and strengthening of more self-determined forms, namely intrinsic motivation and identified regulation, are associated with greater persistence, enhanced performance and the satisfaction of athletes' basic psychological needs (Ryan & Deci, 2000).

Several studies have identified effective strategies to reduce less self-determined forms of motivation and to foster more self-determined types. For instance, Ntoumanis (2005) found that autonomy support provided by coaches was linked to lower levels of external and introjected regulation, and higher levels of intrinsic motivation and identified regulation. These findings suggest that creating a training environment that supports athletes' autonomy may help reduce controlled forms of motivation. Similarly, Pelletier et al. (2001) demonstrated that autonomy-supportive climates are associated with a decline in controlled motivation (external and introjected regulation) and an increase in self-determined forms (identified regulation and intrinsic motivation). This highlights the importance of creating supportive and encouraging environments in which athletes feel valued and understood, thus fostering motivation in a comprehensive manner. In fact, much of the literature suggests that promoting autonomy, competence and relatedness is essential to facilitate the transition from less to more self-determined forms of motivation (Deci & Ryan, 2000). Coaches and other professionals working with athletes should therefore aim to cultivate environments that support these basic needs to foster more adaptive motivational profiles, regardless of the specific age group or sport (Mageau & Vallerand, 2003).

An increase in the less self-determined forms of motivation (amotivation, external and introjected regulation) coupled with a decrease in more self-determined forms (intrinsic motivation and identified regulation) may lead to negative consequences for both performance and athletes' well-being (Pelletier et al., 2013). These patterns were observed among youth swimmers during the season, who also reported a decline in their intention to continue swimming. Such motivational changes may arise from a range of factors, including environments that fail to meet athletes' psychological needs or an increased interest in non-sport activities, as emphasized by Self-Determination Theory (Deci & Ryan, 2000). For example, a study by Amorose and Anderson-Butcher (2007) found that a lack of autonomy support from coaches was associated with increases in controlled motivation and decreases in intrinsic motivation. Athletes in such settings reported greater external pressure, higher levels of external and introjected regulation, and lower intentions to continue sport participation. Lonsdale et al. (2009), in their investigation of burnout among elite athletes from various sports, including swimming, concluded that pressure and control-based environments fostered increases in less self-determined motivation (especially external regulation), reduced intrinsic motivation and elevated amotivation, defined as the absence of intention or desire to engage in sport. Ntoumanis (2001) similarly argued that sport environments lacking support for autonomy, competence and relatedness are likely to increase controlled forms of motivation and reduce the intention to remain engaged in sport. Therefore, it is critical that coaches and practitioners design training environments and methodologies that satisfy athletes' psychological needs, enhancing intrinsic motivation and the intention to continue practicing sport.

In the junior group, the current study showed that both controlled and self-determined forms of regulation increased, while the intention to continue swimming declined. This simultaneous rise in all forms of regulation, coupled with a decline in intention, can be seen as a paradoxical and complex outcome in sport motivation research (Calvo et al., 2010). Such phenomena may occur in ambiguous contexts, where athletes experience both motivating and demotivating factors, leading to divergent motivational outcomes (Lonsdale et al., 2008). In a similar study, Lonsdale et al. (2009) emphasized that the co-occurrence of more and less self-determined motivations may generate internal conflict, thereby lowering long-term intention to participate in sport. That is, athletes may have internal reasons to engage in sport, yet simultaneously experience external pressures and demotivating influences.

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Pelletier et al. (2001), in a study of swimmers, reported similar findings: when athletes perceived their environment as controlling yet simultaneously experienced some degree of self-determination, both types of motivation increased, but intention to continue participation decreased. These results suggest that even in environments that offer some autonomy support, the presence of control may reduce motivation and intention, likely due to internal competition between motivational drivers. Thus, in complex sport environments where both types of motivation rise simultaneously, intention to persist may decrease, particularly when controlling factors dominate.

In the senior group, the data revealed an increase in the less self-determined motivation (external and introjected regulation) and a decrease in the more self-determined motivation (intrinsic motivation and identified regulation), a combination typically associated with negative consequences. Notably, despite this shift, the same group exhibited an increase in the intention to continue swimming, likely influenced by external pressures or the pursuit of extrinsic rewards. Moreno-Murcia et al. (2010) also examined swimmers' motivation and intention to remain in sport, finding that increases in less self-determined forms of motivation were associated with declines in more self-determined ones. Interestingly, even as self-determined motivation declined over time, athletes still expressed the intention to continue, perhaps reflecting a desire for social approval during adolescence or early adulthood. In such phases of life, peer influence and the need for external validation may lead to greater intention, even in the absence of intrinsic motivation.

Variation in intention throughout the season

Intention in sport refers to athletes' commitment to consistently engage in their sporting practice. This variable may be influenced by a wide range of motivational factors, which can be intrinsic, such as a passion for the sport, or extrinsic, such as the desire to win competitions (Deci & Ryan, 2000). Several studies have shown that sport-related intention is strongly linked to intrinsic motivation, particularly when athletes feel autonomous and competent in their training (Ryan & Deci, 2000). For example, swimmers who perceive their sport as enjoyable and rewarding are more likely to train and compete regularly (Hagger et al., 2002).

In the present study, differences were observed between groups, with junior swimmers reporting higher levels of intention than senior swimmers. At the junior stage, individuals are generally still focused on skill development, gaining experience and establishing their athletic identity (Côté, 1999). These athletes are still driven by a love for the sport and the desire to explore their potential, which strengthens their intention to persist in swimming (Fraser-Thomas et al., 2008).

Conversely, senior athletes, who are further along in their athletic trajectory, may exhibit more variable levels of intention due to a range of factors, including competitive pressure, increased injury risk, growing external responsibilities (e.g., work or academic commitments) and unachieved past goals. Still they showed an increase in intention despite an increase in amotivation over the season. There is a possibility that they still have some goals to accomplish, which makes them have the intention to remain in training. Moreover, they have a larger experience to understand that, despite being less motivated at some point, they can turn around the way things go in the next season. Over time, intrinsic motivation may shift toward extrinsic forms, where external recognition, financial rewards and social status become more salient (Ryan & Deci, 2000). Moreover, accumulated experience and confrontation with the physical and structural constraints related to their abilities and team environment may also influence their decision to continue or withdraw from the sport (Lemyre et al., 2007).

Lastly, psychological maturity appears to be a key differentiating factor between junior and senior athletes. Younger athletes, who are still developing their identity and understanding of their capabilities and limitations, may exhibit greater resilience and optimism, strengthening their intention to persist even in challenging contexts (Gould & Carson, 2008). In contrast, senior athletes tend to have more clearly defined and realistic goals based on their accumulated experience and are at a greater risk of burnout, particularly if their motivation is primarily extrinsic (Raedeke & Smith, 2004).

Variation in amotivation throughout the season

At the opposite end of the self-determination continuum lies amotivation, which refers to the absence of intention and motivation to engage in a given activity. Amotivation is a condition that can vary significantly among different

athlete groups across a season and throughout their sporting careers (Pelletier et al., 1995). In the present study, seniors exhibited higher levels of amotivation compared to the younger groups. This pattern aligns with previous findings in the literature, which indicate that older athletes generally report higher levels of amotivation than younger ones. Such variation may be explained by several factors, including changing expectations regarding sport, life experiences, external pressures and physical exhaustion (Brière et al., 1995).

Younger athletes, who are typically at the beginning of their careers, often display low levels of amotivation due to strong intrinsic motivation. They are usually driven by the pleasure of participating, the satisfaction of learning new skills and the desire for social interaction (Côté, 1999; Fraser-Thomas et al., 2008). Notably, these age groups are often exposed to a more playful and inclusive sport environment, where enjoyment and yearly engagement are prioritised, which tends to result in lower levels of amotivation (Weiss & Williams, 2004). In contrast, senior athletes are more likely to experience higher levels of amotivation due to cumulative physical and mental fatigue, increased personal responsibilities and a decline in social support (Stambulova et al., 2009). In addition, senior athletes may perceive that achieving new levels of success or improved results becomes increasingly difficult, which can lead to feelings of purposelessness or reduced drive to continue training (Lemyre et al., 2007).

Variation in introjected regulation throughout the season

Introjected regulation is a form of motivation that lies between intrinsic and extrinsic motivation, according to Self-Determination Theory (Ryan & Deci, 2000). This type of regulation occurs when athletes are driven by the internalisation of external pressures, such as guilt, shame, or the need for approval. In swimming, introjected regulation may be observed when athletes train to meet others' expectations, such as those of coaches, parents, or teammates (Pelletier et al., 2001). In this study, an interaction effect between time and group was identified, particularly between the young and junior groups in December and June, with juniors exhibiting higher levels of introjected regulation compared to younger swimmers. This type of regulation reflects an internal emotional struggle, where athletes may feel compelled to attend training sessions or competitions to avoid disappointing others or to maintain a positive self-image in others' eyes (Pelletier et al., 2001).

Although introjected regulation may effectively increase short-term commitment to training and effort levels, it is often not sustainable in the long term and may lead to negative outcomes such as mental and physical burnout. The literature suggests that introjected regulation is associated with lower levels of sport satisfaction and higher levels of anxiety and stress among athletes (Lonsdale et al., 2009). This occurs because introjected regulation does not adequately fulfil the three basic psychological needs such as autonomy, competence and relatedness, which are essential for high-quality motivation (Ryan & Deci, 2000). In swimming, for instance, an athlete who trains primarily to avoid guilt may develop negative associations with the sport, potentially reducing performance and increasing the likelihood of dropout or burnout (Mallett & Hanrahan, 2004).

Variation in intrinsic regulation throughout the season

Intrinsic motivation is typically influenced by external contexts but originates internally and autonomously (Ryan & Deci, 2000). In swimming, intrinsic motivation is evident when athletes participate in the sport for the love of swimming itself, the challenge of improving their personal bests, or simply the enjoyment of the activity. According to Ryan and Deci (2000), intrinsic motivation arises when the three basic psychological needs, such as autonomy, competence and relatedness, are satisfied. In this context, autonomy refers to the athlete's perception of having control over their training and sporting choices. Competence is fostered through the acquisition and refinement of technical skills or through the achievement of personal milestones. Relatedness develops within the social setting of sport, depending on the quality of interactions with teammates and coaches.

Previous studies have shown that intrinsic motivation is linked to enhanced performance and greater persistence in sport participation (Vallerand & Rousseau, 2001). Moreover, it contributes to increased satisfaction and a more positive perception of one's abilities and progress, thereby promoting overall athlete well-being (Ntoumanis, 2001). Therefore, it is essential that coaches and sport professionals consistently implement strategies aimed at fostering and maintaining intrinsic motivation among swimmers. In doing so, they can maximize engagement, performance and swimmer's well-being, contributing to a more fulfilling and sustainable sporting experience.

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Limitations

Some limitations can be assumed while conducting this study which can be considered in further studies: (i) one of data collection time points took place immediately after the competitions. There is some uncertainty if the results of that competition may have had a positive or negative impact on the individuals' responses to the questionnaires; (ii) the data was collected from different clubs. Different clubs may work with different cultures, modulating motivational aspects differently; (iii) there was no control of the natural maturation, especially in age groups in the developmental stage. It remains the question whether variations observed in motivation and intention were exclusively due to the "time" factor or also to the maturation.

CONCLUSIONS

This study analyzed motivation and the intention to continue swimming throughout a competitive season in different age groups. The results revealed variations between groups concerning the types of motivation and the intention. In the young group, intrinsic motivation predominated, while in the youth group, there was an increase in less self-determined motivation and a decrease in intention. Among juniors, different motivational sources coexisted, accompanied by a reduction in intention. For seniors, an increase in intention and controlled motivation was observed, alongside higher amotivation. These findings indicate that motivation and intention to remain in swimming are an age-specific phenomenon that should be carefully and clearly monitored within and between competitive seasons.

PRACTICAL APPLICATION

This research highlights some recommendations that could guide coaches' interventions in the field of sports motivation and physical activity within the swimming context. The findings suggest that different strategies could be adopted to different age groups. The training for young swimmers should focus on variety and enjoyment, incorporating playful drills, technique challenges presented as games and small rewards for effort can sustain their natural interest in swimming. In the case of youth swimmers (early adolescents), given the decline in intention and increase in less self-determined motivation, coaches should actively involve these swimmers in decision-making (e.g., choosing between two sets, or helping to define short-term goals). Periodic individual talks to discuss personal progress and realistic expectations can also reduce dropout risk. For junior swimmers (late adolescents), coaches may adopt a flexible approach by alternating performance-driven sessions with sessions emphasizing personal improvement or enjoyment. Using training diaries or self-reflection tools can help swimmers clarify their own reasons for staying engaged. For senior swimmers, some strategies such as goal-setting workshops, recognition of effort in team meetings and opportunities for peer mentoring (e.g., seniors guiding younger swimmers) may strengthen autonomous motivation and long-term commitment. Overall, practical measures such as autonomy-supportive coaching (e.g., offering meaningful choices), social support (e.g., team-building activities), and structured goal setting can be implemented across all groups to sustain motivation, reduce dropout, and promote well-being throughout the swimming career.

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