Psicothema

Psicothema 2018, Vol. 30, No. 1, 46-52
doi: 10.7334/psicothema2017.302

ISSN 0214 - 9915 CODEN PSOTEG

www.psicothema.com

Understanding olympic champions and their achievement goal orientation, dominance and pursuit and motivational regulations: A case study

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Abstract

Background: The goal was to compare the achievement goal profile and the motivational regulations of one world-class and two high-level athletes during their preparation for the Rio Olympic Games. **Method:** Three kayakers from the Spanish Olympic team participated. One (P1) and two (P2) were high-level athletes: finalists at the World and European championships, and several national championships. Participant three (P3) was a world-class athlete: 2 Olympic medals, 7 World championship medals, 4 European championship medals, and several national championships. Before and after three training sessions and 4 international competitions (including World and European championships) all participants completed a questionnaire to assess their achievement goal orientation, dominance and pursuit, as well as their motivational regulation. Generalized estimated equations (GEE) analysis was used to assess significant differences between subjects. **Results:** P3 had lower performance-approach goal orientation, stronger mastery-approach goal dominance, lower performance-approach and performance-avoidance goal pursuit, higher mastery-avoidance goal pursuit and lower controlled motivation than the other two participants. **Conclusion:** Our world-class athlete has a strong mastery-approach achievement goal dominant profile, and a low performance-oriented profile (both approach and avoidance) and controlled motivation. This profile should be confirmed in similar athletes to help coaches and their young athletes make appropriate decisions.

Keywords: Motivation, competition, training.

Resumen

Comprendiendo a campeones olímpicos y su orientación, dominancia y búsqueda de meta y regulaciones motivacionales: un estudio de caso. **Antecedentes:** el objetivo fue comparar el perfil de meta y las motivaciones regulaciones de atletas durante su preparación para los Juegos Olímpicos de Río. **Método:** tres kayakistas del equipo olímpico español participaron. Uno (P1) y dos (P2) eran deportistas de alto nivel: diploma en campeonatos del mundo y de Europa, campeones nacionales. Tres (P3) era un deportista de clase mundial: dos medallas olímpicas, once medallas en campeonatos del mundo y de Europa, varios campeonatos nacionales. Antes y después de tres entrenamientos y cuatro competiciones internacionales (campeonatos del mundo y de Europa) cumplimentaron un cuestionario para evaluar su orientación de meta, dominancia y búsqueda, así como sus motivaciones regulacionales. Se usó un análisis de ecuaciones estimadas generalizadas para analizar los datos. **Resultados:** P3 tuvo una orientación de aproximación-rendimiento más baja, dominancia de aproximación-maestría más fuerte, búsqueda más baja de metas de aproximación-rendimiento y evitación-rendimiento y motivación controlada más baja. **Conclusiones:** nuestro deportista de nivel mundial tiene un fuerte perfil de meta de logro de dominancia de aproximación-maestría y un perfil bajo de orientación al rendimiento (aproximación y evitación) y de motivación controlada. Este perfil debería ser confirmado en deportistas similares para ayudar a entrenadores y jóvenes deportivas a tomar decisiones apropiadas.

Palabras clave: motivación, competición, entrenamiento.

Elite, world-class athletes, those capable of winning an Olympic medal, constitute a unique model for research. However, the lack of experimental data prevents researchers and coaches from understanding the determinants of this type of athletes' performance. What gives them their competitive edge? What allows them to consistently excel in top-level competitions? Unfortunately, it is very difficult to have access to these competitors, especially over a long period of time, and find answers to those questions.

Received: August 18, 2017 • Accepted: November 21, 2017
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The Olympic Games symbolize the pinnacle of sports achievement, the definitive accomplishment in any athlete's career (Fletcher & Sarkar, 2012). However, winning an Olympic medal is not easy in any sport, and kayaking is no different. Most research has focused on assessing kayaking performance from the physiological (Li, Niessen, Chen, & Hartmann, 2017), biomechanical (Szychlinska et al., 2017), and physical perspective (López-Plaza, Alacid, Muyor, & López-Miñarro, 2017). However, sports performance also has a psychological component and little research has been conducted in a sport as hard as kayaking, where athletes have to train regularly under adverse conditions of wind and temperature. To our knowledge, only two studies have examined psychological factors such as motivation in kayakers (Ruiz-Juan, Gómez-López, Pappous, Cárceles, & Allende, 2010; Saies, Arribas-Galarraga, Cecchini, Luis-De-Cos, & Otaegi, 2014). Therefore, more research is needed.

The achievement goal theory (AGT; Nicholls, 1984) has been a central framework for understanding motivation in sports contexts: what drives athletes in training and competition. Initially, achievement motivation was divided in two opposite orientations: mastery and performance. Mastery-oriented athletes focus on improving their skills, comparing their performances with previous ones (intrapersonal comparison), while performance-oriented athletes focus on being better than others, comparing their performances with other athletes' performance (normative comparison). Elliot and McGregor (2001) divided each orientation in two categories based on their valence: approach (positive) and avoidance (negative). Approach goals lead athletes to concentrate on obtaining desirable outcomes, while avoidance goals lead athletes to focus on avoiding undesirable results. Consequently, mastery-approach goals are defined in intrapersonal terms and positively valenced, while mastery-avoidance goals are negatively valenced. Similarly, performance-approach goals are defined in normative terms and positively valenced, while performance-avoidance goals are negatively valenced. Two recent meta-analyses have been conducted on achievement goals (Lochbaum & Gottardy, 2015; Van Yperen, Blaga, & Postmes, 2014), and both documents highlighted that both mastery-approach and performance-approach achievement goals have positive effects on sport performance. Therefore, performance-approach goals and sport performance seem to have a heterogeneous relation. Therefore, there has been a call for more studies to clarify for whom and under which conditions performance-approach goals relate to better performance outcomes in sport contexts.

Within the approach-avoidance achievement goal framework, research has shown that some individuals can hold a dominant achievement goal profile, which can also vary in different contexts (Van Yperen, 2006). They consider that a specific achievement goal is the best selection to attain success. However, in sport contexts contradictory results have been obtained. High-level swimmers (Fernández-Río, Cecchini, Méndez-Giménez, Fernández-García, & Saavedra, 2014) and college athletes (Van Yperen & Renkema, 2008) showed strong mastery-approach dominant profiles, while young sport participants (Williams, 1998), tennis players (van de Pol & Kavussanu, 2011), individual and team-sport athletes (van de Pol & Kavussanu, 2012), football players (van de Pol, Kavussanu, & Ring, 2012) and volleyball players (Vansteenkiste, Mouratidis, Van Riet, & Lens, 2014) did not show a dominant profile or this changed over time. Therefore, more research is still needed to clarify this issue, especially in top-level athletes.

Active sport participation to improve one's performance involves setting goals. However, setting a goal does not always mean that the individual is going to actively pursue that goal (Riediger, Freund, & Baltes, 2005). The selection, optimization and compensation model of human development (Baltes & Baltes, 1990) points out that goals are important in an individual's life, because they give direction (Riediger, Freund, & Baltes, 2005) Nevertheless, many people have goals, but they never chase those goals. They do not do what they have to do to actively pursue and integrate them into their lives. Previous studies have showed that athletes can adopt different achievement goals from practice to games (Van de Pol & Kavussanu, 2011, 2012; van de Pol et al., 2012), and from game to game (Vansteenkiste et al., 2014). Therefore, goal pursuit can help understand the global picture of an athlete's achievement goal profile, especially in high-achieving contexts like international competitions, but more research is needed.

The self-determination theory of motivation (Deci & Ryan, 2002) is another fundamental framework to understand motivation in sport contexts; the reasons why individuals pursue certain goals (Gaudreau & Braaten, 2016). It distinguishes between: (a) autonomous motivation, which can be separated into: intrinsic motivation (perform an activity for the satisfaction inherent to it), identified regulation (perform an activity because it is important), and integrated regulation (perform an activity because it is an integral part of the individual), an (b) controlled motivation, which can be divided into: introjected regulation (perform an activity not to feel guilty), and external motivation (perform an activity to obtain something or avoid something negative). Vanteekiste et al. (2014) believe that the impact of achievement goals could be better explained if aims (performance-approach, mastery-approach, performance-avoidance, mastery-avoidance) are studied in connection to motivation (autonomous, controlled), since the same goal can have different "predictive profile" (Elliot & Thrash, 2001, p. 148) depending on the type of motivation (autonomous versus controlled). Therefore, more research is needed to understand the connections between aims and the underlying reasons or motivation, especially in sport.

Based on the aforementioned, the goal of the present study was to compare the achievement goal profile of one world-class and two high-level athletes along their annual preparation for the Olympic Games. The first hypothesis was that the higher the level of the athlete, the stronger the mastery-approach achievement goal dominance. The second hypothesis was that the higher the level of the athlete the stronger the mastery-approach goal orientation. The third hypothesis was that the higher the level of the athlete, the more autonomous the motivational regulation. Finally, the fourth hypothesis was that the higher the level of the athlete, the stronger the mastery-approach achievement goal pursuit.

Method

Participants

Three kayakers from the Spanish Olympic team agreed to participate. Participant number one (P1), 21 years, was a high-level athlete: diploma (finalist) at World and European championships, national champion several times. Participant number two (P2), 23 years, was a high-level athlete: diploma (finalist) at World and European championships, national champion several times. Finally, Participant number three (P3), 31 years, was a top-class athlete: 2 Olympic medals (1 gold, 1 silver), 7 World championship medals (3 gold, 2 silver, 2 bronze), 4 European championship medals (1 gold, 3 silver), national champion several times. The Spanish Olympic Committee considered P1 and P2 high-level athletes (they received a scholarship two years prior to the beginning of the study), while P3 was considered a world-class athlete (he had received many honours over the last 10 years).

Instruments

2x2 achievement goals questionnaire for sport (Conroy, Elliot, & Hofer, 2003). It consists of four subscales (3 items each): mastery-approach (i.e., "It is important to me to perform as well as I possibly can"), mastery-avoidance (i.e., "I worry that I may not perform as well as I possibly can"), performance-approach (i.e., "It is important to me to do well compared to others"), and

performance-avoidance (i.e., "I just want to avoid performing worse than others"). Participants answered on a 7-point likert scale. Following Hambleton, Merenda, and Spielberger (2005), all items were translated into Spanish by a certified translator, and then again into English (reverse translation) to test their similarity with the original ones. Two University Professors, experts in the AGT and fluent in English and Spanish, assessed all items, and approved their adequacy.

Dominance achievement goal assessment instrument (Van Yperen, 2006). Each achievement goal from Elliot and McGregor's (2001) 2×2 framework (mastery-approach, mastery-avoidance, performance-approach, performance-avoidance) is compared in a pairwise fashion with the other three achievement goals. Each participant is faced with six items with two options each, and he/she must choose one. If a particular achievement goal in each of the three contrasts is selected, it is considered his/her dominant goal. If the participant does not consistently choose one goal (because he/she does not have one or because he/she responded randomly or carelessly), it is assumed that the participant does not have a dominant achievement goal. Again, we followed Hambleton et al.' s (2005) procedure to ensure the translated version's adequacy.

2×2 achievement goal pursuit assessment instrument. Based on the research work by Riediger et al. (2005) on goal pursuit, the same framework was adapted to achievement goals. On each of the 2×2 achievement goals (mastery-approach, mastery-avoidance, performance-approach, performance-avoidance) participants responded to the following questions: (a) How much energy do you invest to achieve this goal? (b) How often do you think about this goal? (c) How much time do you invest in this goal? (d) How much does this goal determine your sporting life? They rated their response in a 5-point likert scale. A single score was computed for each participant (mean of all items across all four goals), indicating the participants' average intensity of goal pursuit. Yet again, Hambleton et al.'s (2005) procedure was used to obtain an adequate translated version of the original instrument.

Sport motivation scale-revised (Pelletier, Rocchi, Vallerand, Deci, & Ryan, 2013). It consists of six subscales (three items each): intrinsic motivation (i.e., "Because I find it enjoyable to discover new performance strategies"), integrated regulation (i.e., "Because participating in sport is an integral part of my life"), identified regulation (i.e., "Because I have chosen this sport as a way to develop myself"), introjected regulation (i.e., "Because I feel better about myself when I do"), external regulation (i.e., "Because people around me reward me when I do") and amotivation (i.e., "It is not clear to me anymore; I don't really think my place is in sport"). Participants responded on a 7-point likert scale. Once more, we followed Hambleton et al.'s (2005) procedure to obtain an adequate translated version of the original instrument. Autonomous motivation was obtained from intrinsic, integrated and identified regulations, while controlled motivation was obtained from introjected and external regulations.

Procedure

First, permission from the researchers' ethics committee to conduct the study was obtained. Second, the whole research project was explained to the athletes and to their coach, and a written consent was obtained from all of them. During the preparation for the 2016 Rio Olympic Games, the three participants answered the questionnaires mentioned above prior and after three regularly scheduled training sessions and four international competitions (World championship, European championship and two International meetings). They were asked to be totally honest, guarantying complete anonymity and confidentiality.

Data analysis

The Shapiro-Wilk test ($n < 50$) showed that data followed a normal distribution. Therefore, the generalized estimated equations (GEE) analysis and the Chi-Square test were used to assess significant differences in achievement goal orientation, pursuit and motivational regulations between subjects.

Results

Achievement goal orientation

Table 1 shows means and standard deviation scores of the three participants. The three participants showed a very strong mastery-approach orientation. However, significant differences were observed only in performance-approach goal orientation, $_X^2(2) = 20.57$, $p < .001$, between P3 and P2= OR 8.94; 95% CI 4.75, 16.84 and between P3 and P1= odds ratio [OR] 3.06; 95% CI 1.51, 6.29. Both times, P3 scored significantly lower. No significant differences were observed in mastery-approach ($_X^2(2) = 1.03$, $p = .598$), mastery-avoidance ($_X^2(2) = 3.66$, $p = .160$) or performance-avoidance achievement goal orientation ($_X^2(2) = 1.82$, $p = .402$) between any participant. Figure 1 shows the achievement goal orientation's scores of each one of the three participants (separately) pre and post every training (a total of 3) and every competition (a total of 4).

Achievement goal dominance

Figure 2 shows achievement goal dominance of each participant at pre and post in 3 trainings and 4 competitions. 57.14% of times P1 did not show dominance, 35.71% P2 and 7.14% P3. These three differences were statistically significant: $_X^2(2) = 9.95$, $p < .01$.

Table 1
Achievement goal orientation, pursuit, and motivational regulations

	P1		P2		P3	
	M	SD	M	SD	M	SD
Performance-approach goal orientation	4.14[a]	1.15	5.21[a]	.97	3.02[b]	.78
Mastery-approach goal orientation	5.90[a]	.88	6.07[a]	.87	5.83[a]	.40
Performance-avoidance goal orientation	3.93[a]	1.28	4.36[a]	1.30	3.79[a]	.97
Mastery-avoidance goal orientation	4.19[a]	1.49	4.88[a]	.85	5.11[a]	1.27
Performance-approach goal pursuit	3.79[a]	.47	3.95[a]	.83	2.45[b]	.90
Mastery-approach goal pursuit	3.96[a]	.58	4.18[a]	.59	4.23[a]	.34
Performance-avoidance goal pursuit	3.68[a]	.70	3.84[a]	.46	2.54[b]	.89
Mastery-avoidance goal pursuit	3.79[a]	.48	4.13[ab]	.49	4.09[b]	.27
Autonomous motivation	6.24[a]	.53	5.74[a]	.53	6.03[a]	.44
Controlled motivation	3.65[a]	1.10	4.05[a]	1.08	2.98[b]	.57

Note: M= Mean; SD= Standard Deviation; Means in the same row that do not share superscripts differ at $p < .05$

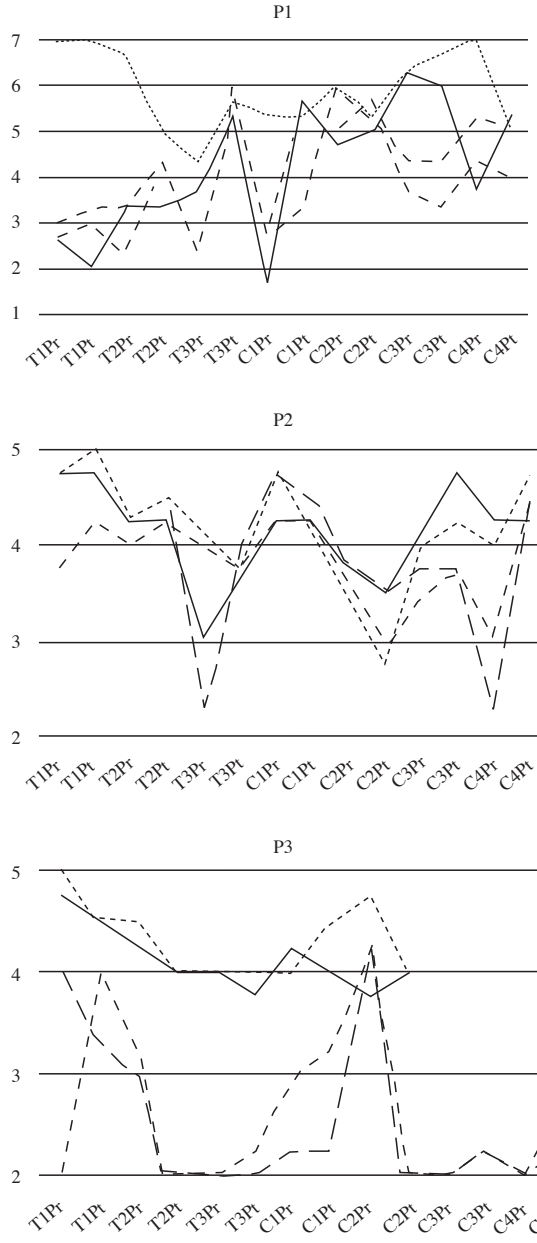

Figure 1. Achievement goal orientation in training and competition (pre, post).
Note: T = Training; C = Competition; PR = Pre; PT = Post

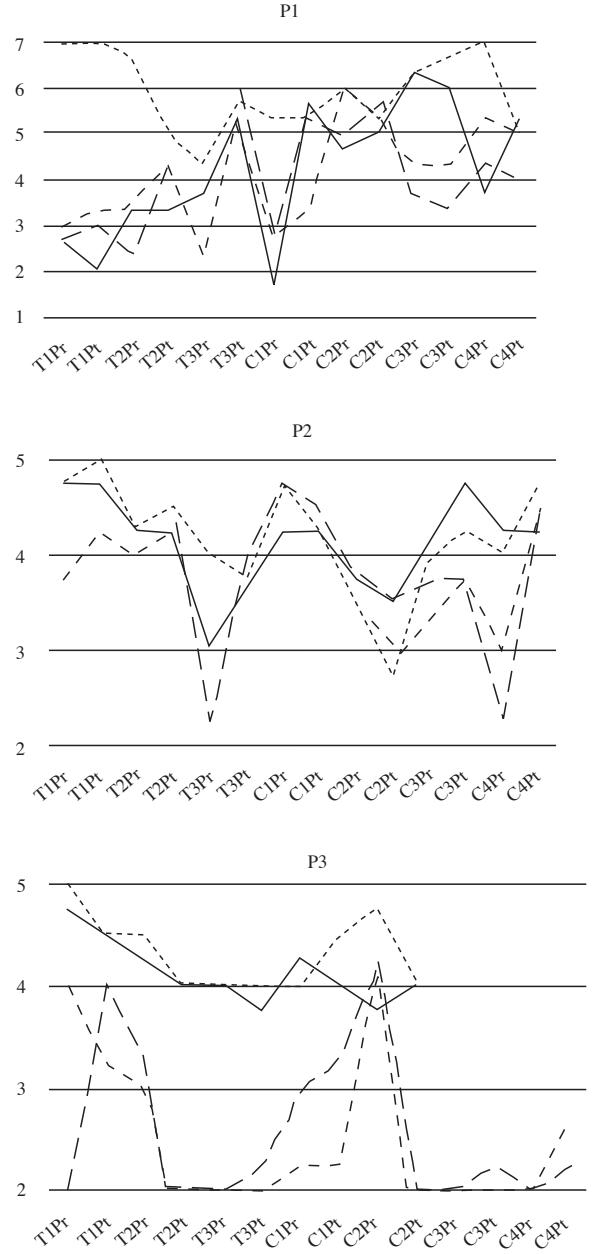

Figure 2. Achievement goal dominance in training and competition (pre, post).
Note: T = Training; C = Competition; PR = Pre; PT = Post

Regarding the type of achievement goal dominance, P1 showed 3 times mastery-approach and 2 times performance-avoidance. P2 showed 3 times mastery-approach and 4 times performance-approach. Finally, P3 showed 11 times mastery-approach and 2 times mastery-avoidance. Differences were again statistically significant: $_{X}^{2}(6) = 23.36, p < .001$.

Achievement goal pursuit

Table 1 shows means and standard deviation scores of the three participants. The generalized estimated equations (GEE) analyses did not show significant differences in mastery-approach goal pursuit: $_{X}^{2}(2) = 3.50$, $p = .174$. Significant differences were observed in performance-approach goal pursuit: $_{X}^{2}(2) = 29.39$, $p < .001$ between P3 and P2: OR 4.48; 95% CI 2.41, 8.34, and between P3 and P1: OR 3.82; 95% CI 2.28, 6.40. In both cases, P3 showed lower scores. The same trend of significant differences was observed in performance-avoidance goal pursuit: $_{X}^{2}(2) = 25.58$, $p < .001$ between P3 and P2: OR 3.68; 95% CI 2.22, 6.12, and between P3 and P1: OR 3.14; 95% CI 1.77, 5.66. Again, P3 showed the lowest scores in both comparisons. Finally, significant differences were observed in mastery-avoidance goal pursuit: $_{X}^{2}(2) = 8.94$, $p < .05$ only between P3 and P1: OR 0.74; 95% CI .56, .98. In this case P3 scored higher than P1 (Figure 3).

Figure 3. Achievement goals pursuit in training and competition (pre, post).
Note: T = Training; C = Competition; PR = Pre; PT = Post

Motivational regulations

The generalized estimated equations (GEE) analyses showed significant differences in controlled motivation ($_{X}^{2}(2) = 13.47$, $p < .001$ between P3 and P2 ($p < .001$): OR 2.92; 95% CI 3.57, 5.42, and between P3 and P1 ($p < .05$): OR 1.97; 95% CI 1.05, 3.70. In both comparisons P3 scored lower (Table 1). No significant differences were found in autonomous motivation ($_{X}^{2}(2) = 6.69$, p = .65).

Discussion

The goal of the present study was to compare the achievement goal profile of one world-class and two high-level athletes during their preparation for the Rio Olympic Games. Results showed that P3 had strong mastery-approach achievement goal dominance, significantly lower performance-approach achievement goal orientation, performance-approach and performance-avoidance achievement goal pursuit, but significantly higher mastery-avoidance goal pursuit. Finally, P3 also showed significantly lower controlled motivation.

The first hypothesis was that the higher the level of the athlete, the stronger the mastery-approach achievement goal dominance, and our results supported it. Our world-class kayakist (P3) showed a very strong mastery-approach achievement goal dominant profile. He showed this profile in 11 out of 14 tests and mastery-avoidance in 2 more ([3 trainings + 4 competitions] × [pre + post] = 14). Therefore, 13 out of 14 tests (92.86%) this world-class athlete (P3) showed a dominant achievement goal profile. The other two high-level participants showed a lower dominant profile: P1 only in 5 tests (35.71%) and P2 only in 7 tests (50%). Mastery-approach goals have been associated with higher levels of enjoyment, self-esteem, satisfaction or self-confidence and lower levels of worry or anxiety (Gaudreau & Braaten, 2016). Results from the present study are in line with previous research works with similar findings: Fernández-Río et al. (2014) found that high-level swimmers maintained a strong mastery-approach profile even after intense workloads, and Van Yperen and Renkema (2008) found the same mastery-approach achievement goal profile in college athletes. It is noteworthy that our world-class athlete (P3) showed the highest scores of all. On the contrary, young sport participants (Williams, 1998), tennis players (van de Pol & Kavussanu, 2011), individual and team-sport athletes (van de Pol & Kavussanu, 2012), football players (van de Pol et al., 2012), and volleyball players (Vansteenkiste al., 2014) did not show a dominant profile or this changed over time. These groups of athletes cannot be considered high-level, because they were either playing a junior league or a medium/low-division senior competition. It has been hypothesized that the higher the level of the athlete the stronger his/her achievement goal dominance in training and competition, and our results seem to confirm this hypothesis in very high-level athletes.

The second hypothesis was that the higher the level of the athlete the stronger the mastery-approach goal orientation, but our results did not support it. The three participants showed a similarly strong mastery-approach achievement goal orientation. This orientation has been associated to a greater commitment to practice, to learning, to improve skills even when failure occurs, which can lead to positive competitive results (Ruiz-Juan et al., 2010). However, our world-class athlete (P3) showed significantly lower performance-approach goal orientation than the other two high-level athletes (P1, P2). Performance goals have been traditionally linked to negative affect over time (Gaudreau & Braaten, 2016). However, two recent meta-analyses (Lochbaum & Gottardy, 2015; Van Yperen et al., 2014) agree that both mastery-approach and performance-approach achievement goals can have a positive outcome on sport performance. Saies et al. (2014) found that expert kayakers showed higher performance and mastery goals (ego and task) than novice kayakers. Motivational regulations seem to play a role in this positive effect: the bolstering function (Gaudreau & Braaten, 2016) or the buffering effect (Healy, Ntoumanis, & Duda, 2016) of the autonomous motivation.

The third hypothesis was that the higher the level of the athlete, the more autonomous his/her motivational regulation, but our

results did not support it. The three participants showed similar high autonomous motivation. As mentioned earlier, autonomous motivation has been linked to positive outcomes in mastery-approach and performance-approach oriented individuals. Our world-class athlete (P3) did show significantly lower controlled motivation than the other two high-level athletes (P1, P2). Controlled regulation can lead athletes to be more concerned with their own performance (Vansteenskiste et al., 2014), which can be detrimental for their results in competition. P3 can be considered a very successful competitor with "nothing to probe", while the other two participants were "prospective" top-level athletes, they still "had to probe" that they can perform at the highest level. This could be the reason behind their significantly higher controlled motivation. Of course this is hypothetical and more research is needed. Vansteenskiste et al. (2014) believed that athletes with mastery-approach goal pursuit may not produce positive outcomes when their motivation is controlled. Our world-class athlete has a dominant mastery-approach goal profile (including pursuit), and he was autonomously motivated. This could help explain, at least partially, his extraordinary positive results in top-level competitions throughout his career. Autonomy has been found a key element for psychological adjustment and growth (Vansteenkiste, Niemiec, & Soenens, 2010). Therefore, it should be promoted.

The fourth and final hypothesis was that the higher the level of the athlete, the stronger the mastery-approach achievement goal pursuit, but our results did not support it. The three participants showed similar mastery-approach goal pursuit. However, our world-class athlete (P3) showed significantly lower performance-approach and performance-avoidance achievement goal pursuit than the other two high-level athletes (P1, P2). Performance or ego goals have been traditionally linked to negative outcomes, but two recent meta-analyses already mentioned (Lochbaum & Gottardy, 2015; Van Yperen et al., 2014) have documented that both mastery-approach and performance-approach achievement goals can have a positive effect on sport performance. The latter does not produce negative outcomes when it is autonomously regulated (Gaudreau, 2012). Moreover, both mastery-approach and performance-approach goals are more strongly related to positive outcomes for individuals who are pursuing them with a high level of autonomous motivation (Cecchini, González, Méndez-Giménez, & Fernández-Río, 2011; Graudeau & Braaten, 2016). Our world-class athlete also showed significantly higher mastery-avoidance achievement goal pursuit. The bolstering or buffering effect of autonomous motivation created by coaches (Castillo et al., 2014) has been observed also in individuals with mastery-avoidance goal pursuit (Michou, Matos, Gargurevich, Gumus, & Herrera, 2016), like our P3.

In conclusion, our world-class athlete showed a stronger mastery-approach achievement goal dominant profile, and a significantly lower performance-oriented profile (both approach and avoidance) and controlled motivation than the two other high-level athletes. These findings should be confirmed in similar athletes to help coaches and their young athletes make the appropriate decisions in the early stages of their career. According to Gaudreau and Braaten (2016, p. 261): "being in a…. team that values and reinforces effort, and mastery… and receiving goal-directed support from autonomy supportive coaches…. might create the needed person × situation fit required for autonomous goal motivation to start playing its bolstering function". Coaches should be aware of it to improve their work.

The present study holds some limitations. First, the number of participants is very limited. More studies with larger samples are needed to be able to generalize the findings. However, it is hard to obtain longitudinal data on world-class athletes. Second, all participants were males. Future research should be conducted in female athletes.

References

Castillo, I., Tomás, I., Ntoumanis, N., Bartholomew, K., Duda, J. L., & Balaguer, I. (2014). Psychometric properties of the Spanish version of the Controlling Coach Behaviors Scale in the sport context. *Psicothema, 26*(3), 409-414.

Cecchini, J. A., González, C., Méndez-Giménez, A., & Fernández-Río, J. (2011). Achievement goals, social goals, and motivational regulations in physical education settings. *Psicothema, 23*(1), 51-57.

Conroy, D. E., Elliot, A. J., & Hofer, S. M. (2003). A 2×2 Achievement Goals Questionnaire for Sport: Evidence for factorial invariance, temporal stability, and external validity. *Journal of Sport Psychology, 25*, 456-476.

Elliot, A. J., & McGregor, H. A. (2001). A 2×2 achievement goal framework. *Journal of Personal and Social Psychology, 80*, 501-519.

Elliot, A. J., & Thrash, T. M. (2001). Achievement goals and the hierarchical model of achievement motivation. *Educational Psychologist, 13*, 139-156. http:// dx.doi.org/10.1023/A:1009057102306

Fernández-Río, J., Cecchini, J. A., Méndez-Giménez, A., Fernández-García, B., & Saavedra, P. (2014). 2×2 dominant achievement goal profiles in high-level swimmers. *European Journal of Sport Science, 14*(3), 265-272.

Fletcher, D., & Sarkar, M. (2012). A grounded theory of psychological resilience in Olympic champions. *Psychology of Sport and Exercise, 13,* 669-678.

Gaudreau, P. (2012). Goal self-concordance moderates the relationship between achievement goals and indicators of academic adjustment. *Learning and Individual Differences, 22,* 827-832. doi:10.1016/j.lindif.2012.06.006

Gaudreau, P., & Braaten, A. (2016). Achievement goals and their underlying goal motivation: Does it matter why sport participants pursue their goals? *Psychologica Belgica, 56*(3), pp. 244-268, doi: http://dx.doi.org/10.5334/pb.266

Healy, L. C., Ntoumanis, N., & Duda, J. L. (2016). Goal motives and multiple-goal striving in sport and academia: A person-centered investigation of goal motives and inter-goal relations. *Journal of Science and Medicine in Sport*, *19*(12), 1010-1014.

Li, Y., Niessen, M., Chen, X., & Hartmann, U. (2017). Method-induced differences of energy contributions in adolescent female kayaking. *International Journal of Sports Physiology and Performance* [e-publish].

Lochbaum, M., & Gottardy, J. (2015). A meta-analytic review of the approach-avoidance achievement goals and performance relationships in the sport psychology literature. *Journal of Sport and Health Science, 4*(2), 164-173. doi: http://dx.doi. org/10.1016/j.jshs.2013.12.004

López-Plaza, D., Alacid, F., Muyor, J. M., & López-Miñarro, P. A. (2017). Sprint kayaking and canoeing performance prediction based on the relationship between maturity status, anthropometry and physical fitness in young elite paddlers. *Journal of Sports Sciences*, *35*(11), 1083-1090.

Michou, A., Matos, L., Gargurevich, R., Gumus, B., & Herrera, D. (2016). Building on the enriched hierarchical model of achievement

motivation: Autonomous and controlling reasons underlying mastery goals. *Psychologica Belgica*, *56*(3), 269-287.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91,* 328-346.

Pelletier, L. G., Rocchi, M. A., Vallerand, R. J., Deci, E. L., & Ryam, R. M. (2013). Validation of the revised sport motivation scale (SMS-II). *Psychology of Sport and Exercise, 14*, 329-341.

Riediger, M., Freund, A. M., & Baltes, P.B. (2005). Managing life through personal goals: Intergoal facilitation and intensity of goal pursuit in younger and older adulthood. *Journal of Gerontology, 60*(2), 84-91.

Ruiz-Juan, F., Gómez-López, M., Pappous, A., Cárceles, F., & Allende, G. (2010). Dispositional goal orientation, beliefs about the causes of success and intrinsic satisfaction in young elite paddlers. *Journal of Human Kinetics, 26*, 123-136.

Saies, E, Arribas-Galarraga, S., Cecchini, J. A., Luis-De-Cos, I., & Otaegi, O. (2014). Diferencias en orientación de meta, motivación autodeterminada, inteligencia emocional y satisfacción con los resultados deportivos entre piragüistas expertos y novatos [Differences in goal orientation, self-determined motivation, emotional intelligence and satisfaction with sport results between expert and novice kayakists]. *Cuadernos de Psicología del Deporte*, *14*(3), 21-30.

Szychlinska, M. A., Dullaert, K., Beumer, A., Nsir, H., Guglielmino, C., Mazzone, V., & Giunta, S. (2017). Ergonomics of prehensility in pushing and pulling motions: An anatomical and biomechanical overview. *Journal of Functional Morphology and Kinesiology*, *2*(1), 6.

van de Pol, P. K., & Kavussanu, M. (2011). Achievement goals and motivational responses in tennis: Does the context matter? *Psychology of Sport and Exercise*, *12*(2), 176-183.

van de Pol, P. K., & Kavussanu, M. (2012). Achievement motivation across training and competition in individual and team sports. *Sport, Exercise, and Performance Psychology*, *1*(2), 91

van de Pol, P. K., Kavussanu, M., & Ring, C. (2012). Goal orientations, perceived motivational climate, and motivational outcomes in football: A comparison between training and competition contexts. *Psychology of Sport and Exercise*, *13*(4), 491-499.

Vansteenkiste, M., Mouratidis, A., Van Riet, T., & Lens, W. (2014). Examining correlates of game-to-game variation in volleyball players' achievement goal pursuit and underlying autonomous and controlling reasons. *Journal of Sport and Exercise Psychology*, *36*(2), 131-145.

Vansteenkiste, M., Niemiec, C. P., & Soenens, B. (2010). The development of the five mini-theories of self-determination theory: An historical overview, emerging trends, and future directions. In Urdan, T. & Karabenick, S. A. (Eds.), *The decade ahead: Theoretical perspectives on motivation and achievement* (pp. 105-166). Bingley, UK: Emeraldpp.

Van Yperen, N. W. (2006). A novel approach to assessing achievement goals in the context of the 2×2 framework: Identifying distinct profiles of individuals with different dominant achievement goals. *Personal and Social Psychology Bulletin, 32*(11), 1432-1445.

Van Yperen, N. W., Blaga, M., & Postmes, T. (2014). A meta-analysis of self-reported achievement goals and nonself-report performance across three achievement domains (work, sports, and education). *PLoS ONE, 9*, e93594. DOI: http://dx.doi. org/10.1371/journal.pone.0093594

Van Yperen, N. W., & Renkema L. J. (2008). Performing great and the purpose of performing better than others: On the recursiveness of the achievement goal adoption process. *European Journal of Social Psychology, 38,* 260-271.