

A comparative analysis of psychological factors in Hungarian Olympic and Paralympic swimming team members

Abstract of PhD Thesis

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1. INTRODUCTION

Swimming is one of the most popular sports due to its beneficial physiological effects (Bíró, 2011). According to survey data reported by Neulinger (2008), swimming is the third most frequently chosen sport in both genders. However, those choosing to replace recreational physical activity with competitive sport have to face the challenge of developing and maintaining psychological conditions specifically required by competition. Namely, competitors aim to continuously reach and improve their best individual performance and to outperform their fellow competitors (Nádori et al., 2011). This requires them to develop an optimal psychological state enabling them to gradually adapt to the workload of the training sessions, to improve their tolerance for monotony and pain, to adequately cope with the experience of failure and emotional fluctuations, and to exploit their strengths and improve in areas where it is necessary (Dubecz, 2009).

The present dissertation focuses on psychological factors which are known both by researchers and practitioners to potentially influence competitive swimming performance. Research in sport psychology considers personality as a direct predictor of sport success (Sheard & Golby, 2010). The so-called “X” factor is possessed by those being open to environmental stimuli, showing an essentially trustful, respectful and understanding attitude towards others, being open to feedback, and adequately handling problems and thus flexibly adapting to their environment (Counsilman, 1977). Hungary’s most successful Olympic swimmer, Katinka Hosszú (2017) points out that the most important characteristic of the above is openness, since a creative approach to training reflected in seeking innovative techniques and ways of development are indispensable for breaking world records.

Although the types and levels of anxiety vary across personality types and life situations, it clearly has an essential impact on individual performance. As long as anxiety remains within the optimal range specific to the individual, it increases performance, but when it falls outside this range, it seriously hinders the competitor in reaching optimal performance (Tringer, 2005). Taylor (2006) suggests that optimal swimming performance requires an extremely high arousal level, irrespective of whether the competitive event is long or short-distance swimming. Both demand intense physical activity, stamina and speed, which may only be maintained at peak arousal. Self-confidence, in turn, protects competitors against discouraging thoughts and feelings (Martens et al., 1990).

Several stressors influence athletes' performance, against which various strategies of protection and prevention may be employed at any given moment. Athletes with a strong sense of control prefer problem-focused coping strategies, while those with a weak feeling of control tend to use emotion-focused strategies (Hayward, Knight, & Mellalieu, 2017). Lafferty and Dorell (2006) suggests that swimmers' primary coping mechanism is escaping into training, which is followed by acceptance and self-blame, preference for which varies across individuals. Révész (2008) found that male swimmers were more likely to efficiently cope with adversities and to peak under pressure than female swimmers.

Emotion regulation is the most important emotional component of coping, which influences the quality, duration, experience and expression of emotions (Gross & Jones, 2003). Emotion regulation is adaptive when the competitor focuses on the positive side of the situation, or when they place their experiences in a broader context, which enables better adaptation to the given situation, while maladaptive emotion regulation is reflected in the competitor's blaming themselves or others and in their exaggerating and ruminating over failures (Garnefski, Kraai, & Spinhoven, 2001). Englert and Bertrams (2012) found that the strategy of repressing emotions imposed excessive cognitive load on competitors, resulted in severer fatigue, increased stress levels and eventually impaired performance.

Motivation includes all internal factors facilitating actions and behaviours. It determines the individual's level of activity and behavioural organization and efficiency (Roberts & Treasure, 2001). The available empirical findings suggest that excessive emphasis is laid on performance both in elite sport and in the education of juniors, which contributes to the development of a self-determined internal model combined with the predominance of extrinsic motivation, while it also increases the likelihood of maladaptive responses such as self-defeating strategies and burnout symptoms (Lemyre, Treasure, & Roberts, 2006). However, a balance between intrinsic and extrinsic motivation is indispensable for peak performance and motivated physical activity (Poulsen et. al, 2006).

The importance of research on competitive sport motivation is also justified by the increasing popularity of elite Para-sports, which efficiently help individual participants cope with their traumas and difficulties by providing them with challenges and objectives, thereby enabling them to improve their coping mechanisms (Bačanac, Milićević-Marinković, Kasum, & Marinković, 2014). The 2010 Paralympic Games in Vancouver involved a total of 4500 competitors representing 192 countries (Brittain, 2010). The increasing popularity of Para-sports is well reflected in the literature in sports science. However, much more research is

needed in this field, especially if assuming differences between the two populations (DePauw & Gavron, 2005; Hanrahan, 2007; for a review, see Delghansai & Lemez, 2017).

2. RESEARCH AIMS

A review of the available empirical literature on the psychological factors of competitive swimming performance clearly reveals that little research has been done in this field (Nagy et al., 2016), and that the related Hungarian studies mainly focus on junior athletes and on talent selection (Révész et al., 2007, 2008). Even fewer empirical studies focus on Para-athletes, and no related research has been done with a Hungarian sample.

The research discussed in the present dissertation was primarily aimed at exploring performance-related psychological characteristics of Hungarian Paralympic swimming team members in terms of anxiety and motivation, which two subjects have received the most attention in the field. Gender differences in measures of both were expected in consistence with previous empirical findings. Another aim of the present research was to compare Para-swimmers and able-bodied swimmers for the most important performance-related psychological factors. Participants were assessed with the most commonly used objective measures of motivation, self-confidence, anxiety, coping skills, emotion regulation and personality traits. Special focus was laid on possible gender differences and on the differences between medal winners and lower-ranking competitors. The following hypotheses were tested in accordance with the research aims.

3. HYPOTHESES

3.1. Hypotheses on gender differences among Paralympic swimming team members

(H₁): Female swimmers will report higher levels of anxiety and lower self-confidence (Lundqvist, Kentta, & Raglin, 2011).

(H₂): Male swimmers will show a better ability to cope with adversities and to peak under pressure (Révész, 2008).

(H₃): Female swimmers will report higher levels of intrinsic motivation (Chantal, Guay, Dobрева-Martinova, & Vallerand, 1996; Nagy et al., 2016).

3.2. Hypotheses on differences between Paralympic and Olympic swimming team members

(H₁): Disabled and able-bodied swimmers will not significantly differ from each other either in extraversion or in emotional stability: they will score relatively high on both (Dieffenbach & Statler, 2012; Cooper, 1969).

(H₂): Disabled swimmers will score higher on both somatic and cognitive anxiety while scoring lower on self-confidence due to typically higher stress levels (Henschen et al., 1992).

(H₃): Disabled swimmers will score lower on all measures of coping capacity, since they less frequently use adaptive coping strategies in competitive situations (Pensgaard et al., 1999).

(H₄): Disabled swimmers will score higher on the use of maladaptive emotion regulation strategies (Pensgaard et al., 1999).

(H₅): Disabled and able-bodied swimmers will not significantly differ from each other in their motivational structures (Huang & Brittain, 2006; Perreault & Vallerand, 2007).

3.3. Hypotheses on differences between medal-winning and lower-ranking swimmers

(H₁): Medal winners will score higher on emotional stability (Rushall, 1970).

(H₂): Medal winners will show lower levels of anxiety and higher self-confidence (Jones & Hanton, 2001).

(H₃): Medal winners will show a better ability to peak under pressure (Révész, 2008).

(H₄): Medal winners will show a higher preference for adaptive emotion regulation strategies (Baron, Moullan, Derulle, & Noakes, 2011).

(H₅): Medal winners will score higher on both intrinsic and extrinsic motivation (Blegen et al., 2012; Révész, 2008).

4. METHOD

4.1. Participants

The Paralympic sample comprised 18 licensed Para-swimmers of the Hungarian Swimming Association, 10 of whom achieved remarkable success at the 2016 Summer Paralympics in Rio. The sample included 9 male and 9 female competitors aged between 14 and 47 years ($M = 26.33$, $SD = 10.81$) with 16.5 years of experience in swimming on average.

The mixed sample of Paralympic and Olympic swimming team members included 12 disabled swimmers and 35 able-bodied swimmers. The overall sample comprised 31 males and 16 females, of whom 12 females and 23 males were members of the Olympic team, while 4 females and 8 males were members of the Paralympic team. Participants' age ranged from 15 to 48 years, the mean age was 23.68 years ($SD = 6.09$). Most participants were aged between 15 and 33 years except two participants aged 40 and 48 years. Able-bodied swimmers' age varied between 17 and 33 years ($M = 23.53$), while disabled swimmers were aged between 15 and 48 years ($M = 24.42$).

4.2. Instruments

Para-swimmers' anxiety was measured with the CSAI-2 and the ACSI-28, while their motivational structures were assessed with the SMS. All of these instruments have been commonly used in Hungarian sports science for several years (e.g. Tóth et al., 2006, 2007, 2010; Gécz et al., 2008, 2009).

The CSAI-2 (Competitive State Anxiety Inventory-2; Martens, Burton, Vealey, Bump, & Smith, 1990; adapted to Hungarian by Sipos, Kudar, Bejek, & Tóth, 1999) is a 27-item Likert scale measuring cognitive and somatic state anxiety related to competitive performance, and state self-confidence. The ACSI-28 (Athletic Coping Skill Inventory-28; Smith et al., 1995; adapted to Hungarian by Jelinek, 2000) is a Likert scale consisting of 28 items and 9 subscales tapping psychological skills competitors may mobilize in order to improve their performance. The SMS (Sport Motivation Scale; Pelletier et al., 1995; adapted to Hungarian by Tsang et al., 2005) is a 28-item Likert scale measuring amotivation, extrinsic motivation, introjection, identification, and intrinsic motivation. The intrinsic motivation scale comprises

three subscales measuring the motivation to know (K), the motivation towards accomplishments (A) and the motivation to experience stimulation (S).

Paralympic and Olympic swimming team members' anxiety and coping capacity were also measured with the CSAI-2 and the ACSI-28, respectively. Their motivational structures were assessed with the more recently developed BRSQ, their personality traits with the BFI, and their emotion regulation strategies with the CERQ-S. The BRSQ (Behavioural Regulation in Sport Scale; Lonsdale, Hodge, & Rose, 2008; adapted to Hungarian by Reinhardt & Tóth, 2017) has better psychometric properties and thus provides more reliable measures than the SMS. The 36-item Likert scale comprises an additional subscale of integration besides those measuring amotivation, intrinsic motivation and extrinsic motivation. The CERQ-S (Cognitive Emotion Regulation Questionnaire-Short; Garnefski & Kraaij, 2006; adapted to Hungarian by Miklósi et al., 2011) is an 18-item Likert scale, whose 9 subscales consist of two items each. The subscales assess five adaptive strategies (acceptance, positive refocusing, refocus on planning, positive reappraisal, putting into perspective) and four nonadaptive strategies (self-blame, rumination, catastrophizing, blaming others). Higher scores on each subscale indicate more frequent use of the specific strategy. The BFI (Big Five Inventory; John & Srivastava, 1999; adapted to Hungarian by Rózsa) is a 44-item Likert scale measuring five personality factors including extraversion, agreeableness, conscientiousness, neuroticism and openness.

4.3. Procedure

Para-swimmers completed the three questionnaires in a paper-and-pencil format under supervision, after a training session in September 2016. Paralympic and Olympic swimming team members also completed the questionnaires used for a comparative analysis in a paper-and-pencil format under supervision, after competitions held during 2017. The statistical analysis of the obtained data was conducted with the SPSS v. 22.0 software. Statistical significance of the results was based on the $p < .05$ probability level conventionally used in social sciences. All post hoc tests were conducted with Bonferroni adjustment.

5. RESULTS

5.1. Findings on the gender differences among Para-swimmers

Female Para-swimmers scored significantly higher on somatic anxiety, on which gender had a strong effect ($p = .022$, $\eta_p^2 = .30$), while no significant gender difference was found either in cognitive anxiety ($p = .663$, $\eta_p^2 = .02$) or in self-confidence ($p = .682$, $\eta_p^2 = .01$). That is, female Para-swimmers as compared to their male counterparts experience higher levels of anxiety, and they have lower self-confidence, which is manifested in higher levels of somatic anxiety. None of the coping measures showed a significant gender difference, while a moderate effect size was obtained for freedom from worry ($p = .155$, $\eta_p^2 = .13$), and a low effect size for goal setting and mental preparation ($p = .271$, $\eta_p^2 = .08$) and for coachability ($p = .342$, $\eta_p^2 = .06$). The results suggest that female Para-swimmers are more likely to experience anxiety, while they show a better ability to cooperate with their coaches and to prepare mentally.

Para-swimmers did not show any gender differences in motivation either, but measurable effects were obtained for two factors. Gender had a weak effect on the intrinsic motivation to experience stimulation ($p = .345$, $\eta_p^2 = .06$) and a moderate effect on identification ($p = .167$, $\eta_p^2 = .12$). That is, female Para-swimmers have stronger intrinsic motivation than male Para-swimmers, which is primarily due to the rewarding effects of physical activity.

5.2. Findings on the differences between Paralympic and Olympic swimming team members

Age and gender were entered as covariates in the model used to compare Paralympic and Olympic swimming team members. The results showed that gender was not associated with significant differences in either group, therefore age was retained as the only covariate for further analysis.

The two groups did not show a significant difference on either of the Big Five personality dimensions, while a moderate effect size was obtained for openness ($p = .069$, $\eta_p^2 = .07$). That is, able-bodied swimmers are characterized by higher levels of initiative and confidence than disabled swimmers.

Significant differences were found in somatic anxiety, which was moderately associated with the grouping variable ($p = .043$, $\eta_p^2 = .09$), and in self-confidence strongly related to the groups ($p = .001$, $\eta_p^2 = .21$). Para-swimmers as compared to able-bodied swimmers show higher levels of anxiety manifested in somatic symptoms. Anxiety affects Para-swimmers'

self-confidence, for example, which is much lower than able-bodied swimmers' self-confidence as a result.

Neither significant differences nor measurable effects were obtained for the assessed coping skills, and the same applies to emotion regulation strategies.

Two dimensions of sport motivation were found to be associated with the grouping variable. On one hand, the groups showed a significant difference on the global intrinsic motivation measure, on which the grouping variable had a moderate effect ($p = .041$, $\eta_p^2 = .09$). On the other hand, the intrinsic motivation to experience stimulation was also moderately associated with the groups ($p = .069$, $\eta_p^2 = .07$), which presumably contributed to the effect obtained for global intrinsic motivation. That is, able-bodied swimmers have stronger intrinsic motivation than disabled swimmers, which is primarily due to the rewarding effects of physical activity, but it is also reflected in the obtained differences in participants' motivation to know and their motivation towards accomplishments.

5.3. Findings on the differences between medal-winning and lower-ranking swimmers

The medal-winning and lower-ranking samples were first defined according to participants' results achieved at the European Championships. In this analysis, a significant difference was found on the positive refocusing subscale of the CERQ-S ($p = .05$) and on the amotivation subscale of the BRSQ ($p = .02$). As compared to lower-ranking swimmers, medal winners' emotion regulation strategies are generally more adaptive primarily due to their preference for positive refocusing, while they are also characterized by higher levels of amotivation.

When the samples were based on participants' results at the World Championships, a significant difference was found on the goal setting and mental preparation subscale of the ACSI-28 ($p = .05$), on the identification subscale of the BRSQ ($p = .04$), and on the neuroticism trait scale of the BFI ($p = .01$). Medal winners show more efficient mental preparation and higher levels of identification as a form of autonomous extrinsic motivation, while they are also less stable emotionally than lower-ranking swimmers.

The samples based on participants' results at the Olympic Games showed a significant difference on the external regulation subscale of the BRSQ ($p = .03$). That is, medal winners have stronger extrinsic motivation than lower-ranking swimmers.

6. CONCLUSIONS

Since the present studies were conducted with representative samples, valid general conclusions may be drawn from the obtained results. Of the 13 hypotheses based on the available empirical literature, 4 were confirmed, 3 were partially confirmed, and 6 were dismissed.

The results confirm that female Para-swimmers experience higher levels of somatic anxiety than their male counterparts. The results of the comparisons between disabled and able-bodied swimmers confirm that the two groups do not significantly differ in their personality traits. Furthermore, disabled swimmers show higher levels of somatic anxiety than able-bodied swimmers. Anxiety, in turn, affects disabled swimmers' self-confidence, which is thus much lower than able-bodied swimmers' self-confidence. The comparisons between medal winners and lower-ranking swimmers confirm that the former are emotionally more stable, and they have more adaptive coping skills and emotion regulation strategies than the latter. Furthermore, medal-winning participants at the World Championships show higher levels of extrinsic motivation than their lower-ranking counterparts.

The following findings contradicted the related predictions. No significant difference was found between female and male Para-swimmers in cognitive anxiety, self-confidence, coping skills, and motivational structures. Nor did disabled and able-bodied swimmers show differences in cognitive anxiety, coping skills and emotion regulation strategies. Para-swimmers as compare to able-bodied swimmers reported higher levels of intrinsic motivation to experience stimulation, while no difference was expected between the two groups' motivational structures. In contrast with the expectations based on previous findings, neither medal-winners nor lower-ranking swimmers showed high intrinsic motivation, nor did the two groups differ from each other in their anxiety levels.

Interestingly, the obtained effect sizes were in many cases consistent with the predictions. These effects indicate that female Para-swimmers actually show higher anxiety, lower self-confidence and higher intrinsic motivation, especially regarding the motivation to experience stimulation, than their male counterparts. Furthermore, Olympic swimming team members are characterized by higher levels of openness than Paralympic competitors. It is also worth noting that the present studies revealed some unexpected findings. As compared to male Para-

swimmers, female Para-swimmers show better mental preparation and higher levels of coachability and identification, although these differences are only reflected in the associated effect sizes. Furthermore, medal-winning participants in both the Olympic and Paralympic samples reported considerable levels of amotivation, which may raise serious concern.

In conclusion, the obtained findings contribute to the clarification of the essential similarities and differences between Para-swimmers and able-bodied swimmers' performance-related psychological characteristics, which subject is receiving increasing scientific attention at an international level. Furthermore, the present dissertation also contributes to the international and Hungarian sport psychology literature on adult elite swimmers, while also paying special attention to Para-athletes psychological characteristics. Finally, the findings of the present dissertation may contribute to the provision of better support for both adult and junior swimmers in their psychological preparation for competition. The presented findings point out the essential importance of athletes' mental preparation in reaching optimal performance at international competitions. Considering the current trends of progress in swimming, it may be established that competitors face ever increasing performance requirements, thus even the smallest of their failures entails exponential drawbacks. It is advisable to start competitors' mental preparation supported by sport psychologists as early as at a junior age, which subsequently enables adult athletes participating in international competitions to consciously and routinely use techniques that help them manage the immense pressure, regulate their negative emotions and reach peak performance. In the long term, only those competitors are able to meet performance requirements at a global level who are motivated both extrinsically and intrinsically above average, and who have the necessary dispositions such as persistence and commitment. Physical ability has little value without an adequate competitive attitude, which is rarely given as a natural inclination. Therefore, it is also coaches' responsibility, besides adequate selection of athletes, to improve competitors' physical and mental abilities simultaneously, with the declared aim of nurturing new generations of Hungarian Olympic athletes, whom the nation may rightly be proud of.

7. LIST OF PUBLICATIONS BY THE AUTHOR

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