Mental Strategies Predict Performance and Satisfaction with Performance Among Soccer Players

by

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This study investigated the changes in mental strategies across the season and their effects on performance and satisfaction with individual performance. Data were collected three times: at the pre-season at Time 1 (T1; baseline), in the mid-season at Time 2 (T2; two-month follow-up), and at the end-of-season at Time 3 (T3; nine-month follow-up) among male soccer players (N = 97) aged 16-27. Athletes completed the questionnaires assessing the use of nine psychological strategies in competition and the level of satisfaction with individual performance. Endurance performance was measured objectively with a 300 m run. A high level of relaxation (T1) explained better 300 m run performance (T3) and a high level of self-talk explained a higher satisfaction with individual performance (T3). A rare use of distractibility and emotional control (T1) predicted a higher level of satisfaction with individual performance (T3). No predictive role of other psychological strategies was found. The use of emotional control, relaxation, and distractibility increased over the season, whereas the use of imagery and negative thinking declined. Besides the roles of self-talk, imagery, relaxation and goal-setting, the effects of distractibility and emotional control should be taken into account when considering athletes' mental training programs.

Key words: *psychological strategies, satisfaction with individual performance, male soccer players.*

Introduction

Performance is among key outcomes in sport psychology (Harmison, 2011; Weinberg and Gould, 2007) and satisfaction with one's own performance is a relevant indicator reflecting athletes' perception of own or team's level of play (Nicholls et al., 2012). Performance and satisfaction with one's own performance depend on modifiable factors, such as the use of psychological strategies by athletes (Gould et al., 1999; Krane and Williams, 2006). Although cross-sectional associations between the use of psychological strategies and athletes' performance were established (Frey et al., 2003; Gould et al., 1999; Jackson et al., 2001), it is less known if the use of these strategies predicts performance over longer time. This study aimed to test the predictive role of psychological strategies acquired by athletes at the pre-season in explaining performance and satisfaction with individual performance at the mid-season and at the end-of-season as well as to examine changes in psychological strategies across the season.

Performance is a sport outcome undoubtedly regulated and influenced by mental factors (Howle and Eklund, 2013). The abilities connected with regulating arousal, processing information and managing emotions are crucial determinants of performance for competitive athletes (Thomas et al., 1999). Thus, focusing on the links between psychological strategies and performance indicators may help to elucidate modifiable factors which may be acquired by

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athletes in psychological skills training (Jackson et al., 2001).

Satisfaction with skills and actions may refer to athletes' satisfaction with their personal level of play and competition outcomes (Balaguer et al., 2002). For team sport games, athletes' satisfaction with their team's level of play and the team outcome of the competition may be also considered (Balaguer et al., 2002). Evaluating performance satisfaction is relevant as it allows to compare performance indicators between athletes competing across different sports disciplines, and across different levels of athlete's expertise. Moreover, performance satisfaction reflects athletes' perceptions of their own performance (Nicholls et al., 2012). However, we found no studies that examined whether a broader set of psychological strategies may predict satisfaction with play at the individual and team level. The present study attempted to fill this void. Athletes use mental strategies for improving performance, increasing enjoyment or achieving a higher sport and physical activity satisfaction (Weinberg and Gould, 2007). The term 'psychological strategies' may be defined as specific actions applied to achieve the enhancement of psychological skills by using one or more psychological techniques (Birrer and Morgan, 2010). Psychological strategies are the core interests of applied sport psychology (Jackson et al., 2001; Weinberg and Williams, 2006; Weinberg and Gould, 2007), yet they are usually studied in a narrow way, focusing on the role of only four strategies, namely imagery, goal-setting, self-talk, and relaxation (Birrer and Morgan, 2010; Flecher and Hanton, 2001; Weinberg and Williams, 2006). Other approaches argue that the structure of psychological strategies is more complex, and propose up to nine strategies (Hardy et al., 2010).

The role and the structure of psychological strategies are discussed in two theoretical approaches: the approach of sport performance strategies by Hardy et al. (1996) and the Psychological Skills Training (PST) approach (Weinberg and Williams, 2006). The Hardy et al.'s (1996) model attempts to distinguish between more and less successful athletes. This model suggested that the most salient psychological strategies used by athletes refer to self-talk, emotional control, automaticity, goal-setting, imagery, activation, relaxation, and negative thinking (Thomas et al., 1999). Recently, distractibility was added to the model (Hardy et al., 2010). It may be argued that this model is well-suited to assess the psychological strategies which are often an important feature of athletes' training programs (Weinberg and Williams, 2006).

The PST approach seems to be verified more often than the sport performance strategies approach (Birrer and Morgan, 2010; Weinberg and Williams, 2006); this may be due to the fact that the number of strategies proposed in the PST is smaller, therefore it is easier to investigate. The PST distinguishes the strategies of self-talk, imagery, relaxation and goal-setting. These four strategies are basic mental techniques and are used in sport psychology interventions (Birrer and Morgan, 2010). According to the PST, using these techniques is most beneficial during the off-season or the pre-season, when there is time to learn new skills, and athletes are under smaller pressure of winning, compared to the end-of-season (Weinberg and Williams, 2006). When learned, psychological strategies might enhance performance, but they are also assumed to help in achieving a greater satisfaction of competition (Lane et al., 2016).

Several studies have analyzed the relationships between psychological strategies and performance. For example, results of a cross-sectional study (Gould et al., 1999) examining Olympic athletes' use of psychological strategies showed that in comparison with athletes who did not perform to their potential, those who did were more successful in handling with distractors, had better prepared performance plans, all based on their use of psychological strategies. The high levels of psychological strategies in athletes were associated with having more confidence, which in turn prompted athletes to perform at their best. Cross-sectional research of the psychological strategies and objective performance confirmed that the better skilled athletes were at using psychological strategies, the more likely it was that they obtained higher scores due to developing control over their emotions or thoughts during performance (Jackson et al., 2001). Another cross-sectional research indicated that the more frequent use of psychological strategies during practice was related to higher perceptions of being successful, not only at practice, but also in competition (Frey et al., 2003).

Furthermore, cross-sectional research on the role of mental preparation strategies used by prominent athletes (Durand-Bush et al., 2001; Greenleaf et al., 2001) showed that a set of cognitive and behavioral skills and strategies (i.e., goal setting, imagery, refocusing plans, automaticity, thought control abilities, and arousal management) were associated with a higher level of performance. The regular use of psychological strategies, such as goal-setting, imagery, relaxation, and performance routines helped athletes to mentally prepare themselves to perform, making it easier to achieve success in sport (Harmison, 2011). Williams and Krane (2001) concluded the review of existing literature with a suggestion that mental strategies were the top components of peak performance. Furthermore, a literature review by Hatzigeorgiadis et al. (2011) indicated that of the plethora of psychological strategies reported, self-talk, relaxation and imagery were commonly used and co-occurred with better sport performance. However, longitudinal research examining the use of psychological strategies is scarce. One longitudinal study conducted with a ten week follow-up indicated that self-talk was also related with performance indicators (Hatzigeorgiadis et al., 2014). Thus, although a myriad of research investigated associations between psychological strategies and performance, their designs have some limitations. The vast majority of the studies used a cross-sectional design and in consequence it is not known how the use of psychological strategies change across the competition phases of the sport season. The long-term effects of using psychological strategies are crucial for predicting successful athletes' performance (Weinberg and Williams, 2006).

The present study is based on the Hardy et al.'s (1996) sport performance strategies model. This model proposes a complex typology of psychological strategies which are expected to affect sport performance. Compared to the PST model, the Hardy's model allows to extend psychological training to a new set of strategies (besides the self-talk, imagery, relaxation, and goal-setting), which could help better explain athletes' performance. Although a great deal of attention has been paid to relaxation, imagery, self-talk, and goal-setting as determinants of effective performance (Weinberg and Williams,

2006), much less notice was given to other psychological strategies such as distractibility or emotional control which may affect athletes' performance.

In line with the PST model, it may be assumed that the peak of the use of psychological strategies should occur before the season and that the pre-season use of strategies should explain performance at the mid- or late-season (Weinberg and Williams, 2006). As learning curves often demonstrate a delay in effect during the early phases of learning (Thomas et al., 2007), the use of psychological strategies at the pre-season should maximize performance gains at the mid-season or the end of the season. Psychological training, aiming at learning psychological strategies, is often applied at the pre-season to mentally prepare athletes to handle the rigors of up-coming competition (Holliday et al., 2008). Thus, athletes who learn and practice psychological strategies at the pre-season can progress from education and acquisition of psychological strategies to their mastery which would enhance their performance.

This study aimed at investigating the predictive effects of nine psychological strategies on athletes' endurance performance and satisfaction with individual performance as well as the changes of these strategies across three measurement points: at the pre-season (the baseline, Time 1; T1), at the mid-season (two-month follow-up, Time 2; T2), and the end-of-season (nine-month follow-up, Time 3; T3). First, it was hypothesized that there would be changes in the use of strategies from the pre-season (T1) to the mid-season (T2) to the end-of season (T3). Second, it was hypothesized that psychological strategies measured at the pre-season (T1) would predict athletes' endurance performance and satisfaction with individual performance at the end-of-season (T3), after controlling for the respective baseline index of endurance performance or satisfaction with individual performance at T1.

Methods

Participants

At T1, the study sample consisted of 97 male soccer players aged 16–27 years ($M = 18.23$, $SD = 1.84$), with reported training experience of 3–15 years ($M = 9.33$, $SD = 2.65$). They reported having 1-20 hours ($M = 12.32$, $SD = 4.27$) of

discipline-specific training weekly (T1). At T3, 45 participants (46.4% of the initial sample) provided their data. The athletes were recruited from five regional soccer clubs preparing youth for professional careers in first to fourth soccer leagues.

Design and Procedures

Data were collected three times, at the pre-season (T1; baseline), in the mid-season (T2; two-month follow-up), and at the end-of-season (T3; nine-month follow-up). The experimenters who were sport psychologists visited the clubs at least four times in two consecutive weeks in order to limit the dropout at T2 and T3. They presented the study protocol to the potential participants and obtained written informed consent. Participants individually filled in the questionnaires measuring psychological strategies.

G*Power calculator was used to estimate the sample size. Assuming medium or medium-to-large effects, N = 88-96 participants were needed to obtain significant effects (p = 0.05, power = 0.80) with up to ten predictors in the equation, N = 95 participants were needed to obtain small-to-medium effects (expected after controlling for the baseline index of endurance performance, for at least two psychological strategies included in the equation). The Institutional Review Board and Ethics Committee at the Regional Medical Chamber approved the study.

Materials

Two self-report measures and an objective performance test were applied.

Psychological strategies at T1, T2, and T3.

The TOPS 2 questionnaire created by Hardy et al. (2010) measures the athletes' use of psychological strategies in competition. There are nine subscales: (1) self-talk (e.g., "Say specific cue words or phrases to help performance"), (2) emotional control (e.g., "Emotions get out of control under pressure"), (3) automaticity (e.g., "Able to trust my body to perform skills"), (4) goal setting (e.g., "Set personal performance goals"), (5) imagery (e.g., "Rehearse performance in my mind"), (6) activation (e.g., "Can get myself 'up' if I feel flat"), (7) relaxation (e.g., "Use relaxation techniques to improve performance"), (8) negative thinking (e.g., "Keep my thoughts positive"), and (9) distractibility (e.g., "Visual distractions would affect my performance"). Each subscale consists of four items. The responses ranged from 1 ("Never") to 5 ("Always"). One item from the original TOPS 2 scale ("Unable to perform skills without consciously thinking") was removed from the automaticity subscale as it was very weakly related to the total score of the scale and the three remaining items (rs < -0.14). Across the three measurement points, the reliability for the subscales was satisfactory (Cronbach's $\alpha \geq 0.64$; Table 1), except for three cases where α ranged from 0.35 to 0.55.

Satisfaction with individual performance at T1 and T3.

The athletes' satisfaction with their individual and team's progress in the tactical skills and psychological aspects as well as their perception of overall performance were examined by an inventory developed by Balaguer et al. (2002). It consists of 5 items; each item constitutes a separate indicator of satisfaction with individual performance (i.e., "How satisfied are you with your tactics skills?", "How satisfied are you with your psychological skills?", "How satisfied are you with your own level of play?", "How satisfied are you with your results?", and "How satisfied are you with team's results?"). In line with Balaguer et al. (2002), five single-item indicators were used. The responses ranged from 1 ("very dissatisfied") to 7 ("very satisfied").

300 m run at T1 and T3.

Endurance performance was measured at T1 and T3 by a 300 m run. Although not specific for soccer, earlier research used runs of similar distance (e.g., 200 m) as one of speed endurance performance tests in soccer players (Iaia et al., 2015). The measure used in the present study was proposed by soccer coaches. The 300 m runs were executed on a grass soccer pitch, with soccer footwear being worn by the athletes. The time was measured with a photocell (T1: M = 44.04, SD = 1.73; T3: M = 44.60, SD = 1.00).

Data Analysis

Data were analyzed using repeated measures analysis of variance to examine changes in psychological strategies across the measurement points (first hypothesis). To examine the relationships between satisfaction with individual performance, endurance performance, and psychological strategies, hierarchical multiple regression analysis was

conducted (second hypothesis). The indices of satisfaction with individual performance (T3) and endurance performance (T3) were used as the outcome variables, and the psychological strategies (T1) were applied as the predictor variable. The analyses were conducted controlling for the respective outcome variables at T1.

Two sets of regression analyses were conducted. In the first set of analysis all psychological strategies indicators (T1) were entered in one step as the predictors of the respective index of endurance performance at T3. The second set included trimmed regression analysis with the endurance performance index at T1 entered in the first step, and with psychological strategies indicators which turned out to be significant in the first set of analysis entered in the second step.

A dataset imputed with the regression method (maximum likelihood estimation) was employed in analyses. Thus, the data of 97 participants was used in all analyses. Imputing missing data is considered an effective way of treating data, even if up to 50% of it is missing (Pigott, 2001). The attrition analysis is presented below. Variance inflation factor (VIF) values ($\leq$ 1.72) and tolerance level values (above 0.58 in all analyses) indicated no multicollinearity problem.

Results

Preliminary analysis

The correlations between variables are displayed in an online Supplement (see goo.gl/3EFPvy). The first and the fourth league players differed in run times at T1, $F(1, 94) = 25.57$, $p < 0.001$, and at T3, $F(1, 94) = 4.09$, $p = 0.046$, with the first league players obtaining better 300 m run times ($M < 44.41$, $SDs < 1.56$) than the fourth league players ($Ms > 44.82$, $SDs < 1.55$). Also, there was a difference between the first and the fourth league athletes in the use of activation strategy at T3, $F(1, 95) = 6.51$, $p = 0.012$, with the first league players using activation rarely ($M = 3.85$, $SD = 0.47$) compared to the fourth league athletes ($M = 4.08$, $SD = 0.41$). Moreover, the first and the fourth league players differed in terms of age, $F(1,95) = 37.40$, $p < 0.001$. The first league players were older ($M = 19.11$, $SD = 1.98$) than the fourth league players ($M = 17.16$, $SD = 0.86$).

Attrition analysis

Drop-outs and completers did not differ in terms of age, years of training, hours of training per week, the five indices of satisfaction with individual performance, endurance performance, and nine psychological strategies (self-talk, emotional control, automaticity, goal setting, imagery, activation, relaxation, negative thinking, and distractibility) across the measurement points, all $Fs < 2.84$, $ps > 0.10$.

Changes in the use of psychological strategies across the season

To assess the changes in time in the psychological strategies across the T1, T2 and T3, repeated measures analysis of variance was used. As shown in Table 1, significant changes in time were observed for five psychological strategies: emotional control, imagery, relaxation, negative thinking, and distractibility.

Post-hoc analyses of variance indicated that the use of imagery decreased from the pre-season to the end-of-season. Also, the use of negative thinking declined from the pre-season to the end-of-season. Furthermore, the use of imagery declined from the mid-season to the end-of-season. The use of emotional control, relaxation, and distractibility increased from the pre-season to the end-of-season. We also found that the use of emotional control and distractibility increased from the pre-season to the mid-season. Moreover, relaxation increased from the mid-season to the end-of-season. Additionally, the use of emotional control and distractibility tended to increase from the mid-season to the end-of-season.

Predicting endurance performance and satisfaction with individual performance (T3) with the use of psychological strategies (T1)

To assess whether psychological strategies predicted the index of endurance performance (T3) and satisfaction with individual performance (T3) a hierarchical regression analysis was conducted. Results are presented in Table 2.

We found that a more frequent use of relaxation at T1 was related to better endurance performance at T3 (a lower running time), after controlling for the baseline time of running.

Regarding the indices of satisfaction, a more frequent use of self-talk (T1) predicted a higher level of satisfaction with own results (T3) and a higher satisfaction with team's results (T3). A lower level of distractibility at T1 predicted a higher satisfaction with own tactics at T3.

Moreover, a rare use of emotional control at T1 predicted a higher level of satisfaction with own psychological skills at T3, the level of play at T3, and satisfaction with the team's results at T3. Overall, the inclusion of respective psychological strategies measured at the pre-season resulted in a significant increment of explained variance (between 10 and 17 percent) of respective indices of endurance performance and satisfaction with individual performance.

Table 1

Repeated measures analysis of variance for the athletes'
use of psychological strategies at T1, T2 and T3

Psychological strategies used by athletes	T1		T2		T3		F	df	p	η^2	Post-hoc comparisons: significant effects at $p < .05$
	M (SD)	α	M (SD)	α	M (SD)	α					T1 > T2, T2 = T3, T1 > T3
Self-talk (T1,T2,T3)	3.33 (0.78)	0.76	3.40 (0.69)	0.85	3.50 (0.48)	0.75	1.590	2, 95	0.209	0.032	
Emotional control (T1,T2,T3)	2.31 (0.51)	0.71	2.45 (0.52)	0.77	2.60 (0.58)	0.90	6.490	2, 95	0.002	0.120	T1 < T2, T2 < T3†, T1 < T3
Automaticity (T1,T2,T3)	3.64 (0.57)	0.67	3.65 (0.53)	0.64	3.66 (0.52)	0.50	0.045	2, 95	0.956	0.001	
Goal_setting (T1,T2,T3)	3.91 (0.63)	0.75	3.80 (0.60)	0.81	3.80 (0.54)	0.87	1.410	2, 95	0.250	0.029	
Imagery (T1,T2,T3)	3.71 (0.74)	0.81	3.73 (0.62)	0.80	3.50 (0.70)	0.90	8.404	2, 95	< 0.001	0.150	T2 > T3, T1 > T3
Activation (T1,T2,T3)	3.94 (0.54)	0.81	3.84 (0.49)	0.81	4.00 (0.47)	0.81	2.906	2, 95	0.060	0.058	
Relaxation (T1,T2,T3)	2.92 (0.80)	0.84	3.00 (0.70)	0.84	3.20 (0.66)	0.84	5.054	2, 95	0.008	0.096	T2 < T3, T1 < T3
Negative thinking (T1,T2,T3)	3.01 (0.65)	0.66	2.45 (0.55)	0.58	2.50 (0.54)	0.82	23.73	2, 95	< 0.001	0.333	T1 > T2, T1 > T3
Distractibility (T1,T2,T3)	2.40 (0.54)	0.35	2.62 (0.61)	0.67	2.80 (0.56)	0.72	10.834	2, 95	< 0.001	0.186	T1 < T2, T2 < T3†, T1 < T3

T1 = Time 1, baseline; T2 = Time 2, 2-month follow-up;
T3 = Time 3, 9-month follow-up (significant effects are marked in bold); † - p < .10

Table 2

*Hierarchical regression for variables predicting performance
and satisfaction with individual performance*

Predictor variable/ Outcome variable	300 m run test (T3)	Satisfaction with own tactics (T3)	Satisfaction with own psychological skills (T3)	Satisfaction with own level of play (T3)	Satisfaction with own results (T3)	Satisfaction with team's results (T3)
	β (p)	β (p)	β (p)	β (p)	β (p)	β (p)
Effects of all nine psychological strategies without controlling for the baseline outcome measurement						
Self-talk (T1)	0.04 (0.733)	0.22 (0.064)	0.20 (0.084)	0.15 (0.216)	0.40 (0.001)	0.40 (0.001)
Emotional control (T1)	- 0.003 (0.980)	- 0.15 (0.192)	- 0.40 (0.001)	- 0.27 (0.018)	- 0.20 (0.148)	- 0.24 (0.035)
Automaticity (T1)	- 0.16 (0.168)	< .001 (0.999)	-0.10 (0.541)	0.02 (0.848)	0.13 (0.239)	0.10 (0.653)
Goal-setting (T1)	- 0.11 (0.359)	0.20 (0.085)	0.23 (0.041)	0.20 (0.095)	- 0.10 (0.491)	- 0.13 (0.259)
Imagery (T1)	- 0.04 (0.734)	- 0.11 (0.403)	- 0.17 (0.156)	- 0.15 (0.246)	- 0.20 (0.108)	0.10 (0.946)
Activation (T1)	- 0.10 (0.406)	- 0.08 (0.470)	- 0.03 (0.745)	0.08 (0.457)	- 0.01 (0.955)	- 0.10 (0.649)
Relaxation (T1)	- 0.30 (0.034)	- 0.02 (0.864)	- 0.13 (0.271)	0.10 (0.657)	0.30 (0.017)	0.04 (0.764)
Negative thinking (T1)	- 0.09 (0.439)	- 0.001 (0.991)	- 0.10 (0.576)	- 0.10 (0.374)	- 0.10 (0.497)	- 0.10 (0.447)
Distractibility (T1)	0.06 (0.635)	- 0.40 (0.002)	- 0.20 (0.121)	- 0.04 (0.719)	- 0.10 (0.630)	- 0.03 (0.768)
R²	0.16	0.22	0.30	0.20	0.30	0.19
Effects of psychological strategies after controlling for the baseline outcome measurement						
Step 1:						
R²	0.14	0.13	0.10	0.10	0.02	0.002
outcome at T1	0.38 (< 0.001)	0.36 (< 0.001)	0.10 (0.337)	0.30 (0.003)	0.14 (0.171)	0.10 (0.630)
Step 2:						
outcome at T1	0.35 (< 0.001)	0.34 (< 0.001)	- 0.05 (0.598)	0.16 (0.146)	0.15 (0.124)	0.02 (0.823)
Self-talk (T1)	n.i.	0.07 (0.450)	n.i.	0.10 (0.340)	0.30 (0.006)	0.35 (0.001)
Emotional-control (T1)	n.i.	n.i.	- 0.42 (< 0.001)	- 0.30 (0.007)	n.i.	- 0.23 (0.020)
Goal-setting (T1)	n.i.	0.11 (0.254)	0.14 (0.138)	0.14 (0.161)	n.i.	n.i.
Relaxation (T1)	- 0.240 (0.011)	n.i.	n.i.	n.i.	0.20 (0.133)	n.i.
Distractibility (T1)	n.i.	- 0.41 (< 0.001)	n.i.	n.i.	n.i.	n.i.
Δ R²(p) for Step 2	0.10 (0.011)	0.17 (< 0.001)	0.17 (< 0.001)	0.10 (0.026)	0.14 (0.001)	0.15 (0.001)
F(df) and p for respective equation	F(2, 94) = 11.71 p < 0.001	F(4,92) = 9.54 p < 0.001	F(3,93) = 6.65 p < 0.001	F(4,92) = 4.90 p = 0.001	F(3,93) = 6.08 p = 0.001	F(3,93) = 5.49 p = 0.002

T1 = Time 1, baseline; T2 = Time 2, 2-month follow-up; T3 = Time 3, 9-month follow-up;
n.i. – not included into the final regression equation due to non-significant
effects found in the preliminary analyses, accounting for the effects
of nine strategies without controlling for the T1 indicator of the respective outcome.

Discussion

This longitudinal study provides novel evidence for the relationships between psychological strategies and endurance performance as well as athletes' endurance performance and satisfaction with individual performance. To our knowledge, this is the first study which seeks for the predictive role of a broader range of psychological strategies than those indicated in the PST model. In particular, previous research drew more attention to only four psychological strategies, namely self-talk, imagery, relaxation, and goal-setting (Birrer and Morgan, 2010; Weinberg and Williams, 2006), whereas we extended the research including five additional strategies. Overall, our findings point to the need for going beyond the four strategies included in the PST, if long-term changes in endurance performance and satisfaction are to be explained.

The results confirmed that the levels of the use of psychological strategies may change across the pre-, mid-, and the end-of-season (first hypothesis). We found that there were distinct trajectories of changes in time within the use of emotional control, imagery, relaxation, negative thinking, and distractibility. Our findings suggest that the use of psychological strategies fluctuates across the season contrary to the assumption that they should occur before the season (e.g., Weinberg and Williams, 2006). In our study this assumption was significant in case of two strategies. The use of imagery decreased from the pre- to the end-of-season. Also, the negative thinking declined from the pre-season to the mid-season. In contrast, the use of emotional control, relaxation and distractibility increased from the pre-season to the end-of-season. Furthermore, we found that the use of emotional control and distractibility increased from the pre-season to the mid-season. Moreover, relaxation increased from the mid-season to the end-of-season.

The second hypothesis referred to the psychological strategies measured at the pre-season (T1) and their predictive role in endurance performance and satisfaction with individual performance at the end-of-season (T3). Our findings suggest that a frequent use of relaxation was predictive of a 300 m run at a higher level. Similar results have been found in previous cross-sectional research and studies with short-term follow-ups (Harmison, 2011; Hatzigeorgiadis et al., 2011, 2014) that showed a frequent use of relaxation prompted obtaining a high level of performance. Importantly, the current study indicated no predictive role of other strategies in performance. The key role of relaxation strategy has significant implications for mental practice. Training of psychological strategies should focus on teaching athletes how to effectively obtain the state of relaxation during training and competition.

We found that a more frequent use of self-talk (T1) was connected with a higher level of satisfaction with own (T3) and team's results (T3). Similarly, in cross-sectional research (Latinjak et al., 2011) using self-talk strategy was correlated to the level of satisfaction with individual performance among adult tennis players. However, results of the current study showed no predictive role of goal-setting in explaining satisfaction with individual performance. This finding is not congruent with theoretical models highlighting the role of goal setting in performance (Locke and Latham, 1990), illustrating that accomplishing the previously set goal can lead to satisfaction, yet if the set goal is not accomplished, it may lead to frustration. It is possible that in the context of team sports, the use of individual goal setting is related to performance indices indirectly, with the perceived fit between individual and team goals playing the mediating role. So far, research has indicated that perceived fit between individual and team's performance goals was related to a higher individual satisfaction and contribution to the team (Kristof-Brown and Stevens, 2001). However, the above mentioned studies did not demonstrate longitudinal effects of goal-setting on PS, which are the first step in any causal attributions. Concluding, our study points out that a broader range of strategies that the four included in the PST model (Birrer and Morgan, 2010; Weinberg and Williams, 2006) is required to explain athletes' satisfaction at the end-of-season. Thus, our findings support the sport performance strategies approach by Hardy et al. (1996) which suggests that more than core four strategies are needed to explain performance-related outcomes.

Our study points to the detrimental effects of the frequent use of some of the strategies on satisfaction indices. A frequent use of

emotional control and distractibility was predictive of poorer satisfaction with individual performance. It may be assumed that these strategies operate indirectly, through their effect on negative performance-related emotions, such as performance anxiety (Flecher and Hanton, 2001). Frequent use of emotion control or high scores in distractibility may occur as a result of high levels of negative emotions: athletes may use such strategies to alleviate negative emotions. Therefore, taking into account the context of negative performance-related emotions would be beneficial for better explanation of the effect of the use of these strategies. Consequently, future research needs to account for emotional states as determinants and mediators of the use of psychological strategies.

Our findings might be of practical meaning for applied sport psychology, as they suggest that the effect of using psychological strategies may be helpful in performance enhancement and satisfaction with individual performance. Nowadays psychological strategies are significant parts of sport training programs (Birrer and Morgan, 2010). The use of specific psychological strategies is often assumed to help athletes optimize their performance (Gould et al., 1999; Jackson et al., 2001). Because of that, it is the key issue to broaden the range of diagnosis and training of psychological strategies and thus better explain athletes' endurance performance and satisfaction with individual performance. Furthermore, with regard to such strategies as emotional control and distractibility we may say 'less is more', that is their frequent use may represent a sign that the athlete is at risk of a lower satisfaction with individual performance. Moreover, as indicated by Flecher and Hanton (2001), non-elite athletes mostly rely on relaxation strategies to diminish their anxiety, applying other strategies less frequently. Similarly, Thomas et al. (1999) found that non-elite athletes and recreational performers used a narrower range of psychological strategies than international athletes. In our study, athletes often relied on relaxation and self-talk, yet rarely on techniques applying distractibility and emotional control.

One of the key limitations of the present study refers to the operationalization and measurement of the two psychological strategies. In particular, the measures of distractibility and

negative thinking proposed by Hardy et al. (2010) encompass both the psychological strategies (e.g. ability to keep thoughts positive) and their mental outcomes (e.g. having thoughts of failure). Thus, the theoretical and measurement developments should focus on distinguishing between strategies and their outcomes. The second major limitation refers to the choice of the performance indicator. Although endurance runs (300 m) were previously used in the context of performance evaluation in soccer, a standard evaluation would account for sprint performance (runs of 20-30 m). The limitation is also the high attrition rate. Moreover, in line with previous research on psychological predictors of performance in sports (Gould et al., 1999; Jackson et al., 2001; Krane and Williams, 2006), our study enrolled a homogeneous group of male non-elite soccer players. Hence, generalizations to both genders and individual disciplines should be made with caution. As gender may constitute a relevant determinant of using psychological strategies (Thomas et al., 1999), future research should establish whether the patterns of relationships are similar for men and women. The number of enrolled participants was relatively small which could have led to non-significant findings. All of these issues might have contributed to the weak reliability levels of some of the TOPS' scales. Although, the TOPS is considered a relevant and reliable instrument commonly used among athletes, replications are necessary before firmer conclusions can be drawn. According to previous research, data showed that the use of different types of psychological strategies was associated with athletes' age (Munroe-Chandler et al., 2012; Thomas, 1999). Future research could include more diverse samples in terms of age and investigate the predictive role of age in using psychological strategies in order to provide the best explanation of performance-enhancement factors. Moreover, as with all self-report studies, the robustness of the findings is dependent on the validity of the responses provided. The athletes were asked to think about their sport experiences, both in general as well as in relation to a specific event accomplished prior to their event-based responses. The retrospective character of the responses could have been affected by social desirability, evaluation anxiety or by other factors connected with sport involvement not included in

this study. Another limitation might be not taking into account emotional and self-regulatory factors that may play a key role in sport performance (Blecharz et al., 2014; Howle and Eklund, 2013). Our study used specific points across the sport season and we did not measure mid-season performance. Further research investigating the role of the psychological strategies applied at the pre- or mid-season on individual and team performance indices measured at the end-of-season should be conducted. Finally, although psychological strategies are considered to have a performance-enhancing effect (Durand-Bush et al., 2001; Greenleaf et. al, 2001; Jackson et al., 2001), it is still unclear how much time one has to spend using these strategies or if a frequent use of these strategies may be related to an improvement of performance and how the frequent use is related to a decline of performance or the risk of the athletes' overtraining. Consequently, any conclusions are preliminary and further research is needed.

In conclusion, to our knowledge, this is the first study showing changes in psychological strategies across the season, and examining long-term effect of using psychological strategies on performance and satisfaction with individual performance with play at the individual and team level. Our research was novel in the way of treating psychological strategies as predictors of an objective performance and additionally, as the predictors of athletes' satisfaction with individual performance. Furthermore, we showed that a different set of strategies may predict athletes' satisfaction, compared to those which related to objective indices of performance. Our research indicates that it may be important to account for the role of the strategies which are disregarded by the PST model (Birrer and Morgan, 2010; Weinberg and Williams, 2006), such as distractibility and emotional control. These strategies may help better explain athletes' satisfaction with individual performance.

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