

A multi-faceted assessment of sports motivation in relation to training effectiveness in progressive recreational skiers

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ABSTRACT

Introduction. Motivation and its typology have been researched by sport psychologists worldwide.

Aim of Study. The study aimed to examine correlations between sources of motivation and training effectiveness in progressive recreational skiers.

Material and Methods. Achievement motivation, consisting of task motivation and ego motivation, was examined using the Task and Ego Orientation in Sport Questionnaire (TEOSQ). The sources of motivation were assessed with the Sport Motivation Scale (SMS). The study sample comprised 198 subjects oriented to improve their skiing skills. The sample included 138 men and 60 women at the mean age of 21 years.

Results. The main source of skiers' motivation was found to be intrinsic motivation although both intrinsic and extrinsic motivations displayed positive correlations with skiers' training effectiveness. Achievement motivation in skiers was mostly conditioned by their task motivation rather than ego motivation, regardless of gender. Different dimensions of motivation appeared to be significant factors influencing skiing effectiveness.

Conclusions. Coach-athlete or teacher-student communication would be more effective, if coaches or teachers could relate to their athletes or students in accordance with the characteristic types of motivation to enhance their commitment to the taught subject or sport and to strengthen their satisfaction of performance despite demotivating failures.

KEY WORDS

psychology, motivation, skiing, effectiveness.

Introduction

Problems in sport performance related to motivational overpressure or lack of optimal motivating from coaches and instructors result from improper analysis of athletes' psychical states conditioned by motivational processes. In Polish sport psychology motivation has been commonly assessed for a long time by a modified Achievement Motivation Questionnaire by M. Widerszal-Bazyl [1]. However, studies have not confirmed the satisfactory applicability of this tool in sport. Methods analyzing motivation in sport used in the present study, i.e. the Task and Ego Sport Motivation Questionnaire [2] and Sport Motivation Scale [3], have been successfully applied in many countries. They were devised by renowned British, French and Canadian specialists in sport psychology on the basis of scientifically confirmed motivation theories (e.g., Self Determination Theory). The present study would make a contribution to their prospective adaptation into Polish psychology. The authors of these measures granted their full consent

to adapt, normalize and apply the original methods in Poland.

Motivation plays a crucial role in one's implementation of plans or attainment of goals. The fact that one can be passive or active by nature, committed or indifferent, is an indication of effects of one's own individual dispositions or biologically determined traits in response to specific environmental or situational factors. The social context, in particular, is a factor differentiating motivational and developmental processes in humans, including interpersonal differences. Therefore, the course and control of motivational processes as well as their abilities to consciously and effectively act in particular situations can be different in different individuals [4]. The majority of motivation researchers and theorists maintain that motivation states are urge- and need-specific and must be defined in terms of specific goals and orientations. This assumption is in fact taken for granted in studies on psychosocial motivation [5]. Thus the concept of motivational state is often understood as a cause of a specific behavior or

behavioral tendency. Motivation is a process in which one gains access to specific resources – talent, energy, time – and administers them in a specific, chosen way [6]. It is a two-dimensional process which can be called the “personal investment theory”. The first dimension involves the effects of external factors determining the perception of a specific situation. The other dimension is concerned with the utilization of one’s own resources in a specific situation perceived subjectively.

Motivation in sport

Selected aspects of motivation in sport have been the subject of numerous studies [7, 8, 9]. The typology and range of motives for selecting active ways of spending leisure time are extensive and may include seeking pleasure, fun, social contacts, maintaining good fitness, attainment of goals, or improvement of one’s health [10, 11]. The multidimensional approach to motivational processes determining one’s participation in physical activity should be, in our opinion, based on an interpretation of sources of motivation in sport accounting for intrinsic motivation, extrinsic motivation and amotivation. It should also involve achievement motivation and goal orientation (task and ego motivation), which are crucial in such technically demanding sports as skiing. In sport, extrinsic and intrinsic motives are important, and sport psychologists place an equal emphasis on both types of motivation in their efforts to improve athletes’ performance [12]. The intrinsic motives for participation in physical activity include excitement, passion to act and the possibility to demonstrate and improve one’s skills. The intrinsic motives are particularly effective as they directly affect athletes’ emotions [13]. The extrinsic motives include trophies, awards and various non-material benefits such as prestige or social standing. People take up sports mostly for intrinsic rather extrinsic reasons; however, extrinsic motivation is often used to enhance intrinsic motivation. The differences in motivation types are particularly visible between competitive and recreational sports. A skier’s behavior is determined to a large extent by the course of motivational processes as well as by the interaction between his or her subjective characteristics and situational factors conditioning his or her perseverance, speed of learning and effectiveness. A sport result is therefore determined by numerous factors [14]. The present study which deals with psychosocial understanding of sport motivation implements selected motivation theories related to effectiveness in recreational skiing. They are the goal orientation theory (task- and ego-motivation) and self determination theory in sport (intrinsic motivation, extrinsic motivation, amotivation).

Goal orientation in achievement motivation (task motivation, ego motivation)

The relationship between pursuance of goals and competitive sport seems obvious [15], unlike the relationship between motivation and recreational sport. It may appear that rivalry, desire for success or long-term objectives of development of motor skills, so typical for competitive sports, cannot be found in recreational sports. However, the modern concept of physical recreation includes ele-

ments of self-development or even competition [7]. In many aspects the concept of achievement in physical recreation corresponds to achievement in sport. Research shows that people tend to base their psycho-physical self-assessment on such properties as strength, fitness or appearance [16]. This is why physical activity is a good opportunity for the development of patterns of behavior based on goal orientation in achievement motivation. People individually perceive themselves through physical attributes, and a high self-assessment level through these attributes is regarded as a success. Some psychologists consider the desire to achieve success to be innate and some to be acquired through experience [13].

The theory of goal achievement stipulates that the structure and strength of motivational processes in pursuing specific achievements, e.g., in sport, depend on the development of particular goals of one’s individual participation in a specific sport activity [17]. The present-day theories of goal in achievement motivation are increasingly more often related to physical recreation, and they assume the existence of two dominant goal perspectives. One focuses on subjective perception of a possibility of success, subject to self-assessment; the other is concerned with both subjective perception and normative reference of a goal. According to J.G. Nicholls [18] goal orientation refers to the way one interprets the concept of competence and defines the concept of success in a given area. It also involves two goal perspectives: task and ego, related to the amount of effort to achieve a given task, and aspects of intrinsic motivation such as choice of task difficulty, execution and perseverance [19].

Task-motivated individuals, by using self-evaluation, build up a conviction of their abilities on the grounds of learning or developing motor skills which enhance the knowledge and perception of one’s competence and effectiveness [20]. Such individuals concentrate on their personal development and the perceived success depends mainly on their effort and perseverance. They choose tasks of high standards, and their efforts are on a high level. They also display a high level of perseverance regardless of the perceived level of competence.

Ego-oriented individuals feature a normative approach to their abilities, and they perceive their competences through manifestations of better capabilities or performance with less effort. Ego-oriented individuals focus on winning and their success is perceived through their relative competences as opposed to those of other participants, regardless of the amount of effort [15]. Such people are expected to take part in an achievement situation and perform a task until they have noted that their level of professionalism in a given area is sufficient in comparison with other participants’ competences. All these variables of the goal orientation theory show that task-oriented individuals achieve a higher level of task performance than ego-oriented individuals (relative to their capabilities). Ego-oriented individuals achieve desired effects of activity only with the perceived high level of competences.

The goal orientation theory has been widely applied in research on motivation in physical activity [21]. Studies in sport psychology concerning the application of goal orientation theory have confirmed the differences between task-

motivation and ego-motivation as well as its impact on athletes' behavior [2, 20, 22]. The field of physical recreation has not been yet thoroughly studied in terms of application of the aforementioned theory; however, it seems that participants' goal orientation can greatly influence their effectiveness in physical activity.

Sources of motivation in sport (extrinsic motivation, intrinsic motivation, amotivation)

The Self Determination Theory by Richard M. Ryan and Edward L. Deci is understood as an effect of fulfillment of man's psychological needs of competence, relatedness and autonomy. The theory assumes that one's ability to use natural dispositions for one's own development and commitment is as much important as the social sphere and knowledge of situations in which one functions. The natural human tendency to learn and be creative is described in self determination theory as intrinsic motivation. In the process of self-regulation one transforms one's perception of external motives into qualities that stimulate one's activity and enhance motivational processes through internalization [23]. Internalization is a process of self-regulation, during which one assimilates social rules and regulations. The degree of internalization determines the course and character of motivational processes.

Extrinsic motivation is a psychological state in which activity is undertaken but the process of internalization is not completed. Activity can be exclusively based on external factors such as material rewards or avoidance of failure or punishment. There is no compliance with external rules or their internalization. A partial internalization takes place when external rules are accepted by an individual, but they are not part of the individual's motivational system. This type of motivation relies on the contribution of ego, and that is why activity is determined by such internal experiences as feelings of guilt, shame, anxiety, etc. Thus intrinsic factors are present here; however, they are not fully internalized. Once the values and rules are accepted and, moreover, appreciated, then one's commitment becomes conditioned, for example, in consideration of one's well-being as a result of fulfilled needs. Activity is based on full internalization of rules when they become part of one's own motivational system. One is involved in an activity because thanks to it he or she can experience pleasure, satisfaction and harmony.

Intrinsic motivation is a model motivation type which is hard to achieve. In intrinsic motivation the reason to act derives from one's internal desire. Internalization is not automatic in intrinsic motivation; it requires time and proper conditions. A significant role in the process of intrinsic motivation is played by role models such as teachers, coaches and parents, whose activity should be directed towards building learner's autonomy, providing support, guidelines and advice but also towards respect for one's own independence. Thanks to such role models the process of internalization becomes integrated with one's internal desires.

Amotivation occurs when activity lacks justification, determination and internalization. It is described as a state of suspension and uncertainty about motives to act in a given situation. It is also an indicator of possible resignation from a specific activity.

Aim of Study

The present study attempted to utilize new measurements of motivation in sport in downhill skiing. The research area was a situation of highly demanding sports rivalry requiring from the participants a high level of control of psychical processes, which they often cannot comply with when experiencing resignation, fever or pre-start apathy [24].

The study was aimed to describe motivation processes in progressive recreational skiing and find relationships between achievement motivation and sources of motivation in training skiers, and their sports results in specialist skiing training. The selection of the study's aim was justified by the need to fulfill the difficult technical demands of skiing in relation to the psychosocial context of recreational skiing. The study was also designed as a springboard for analysis of motivational processes in other sports.

Research hypotheses:

The analysis of literature on psychosocial determinants of sport as well as individual properties of athletes allowed us to formulate the following research hypotheses:

1. The voluntary character of fulfillment of skiing tasks (progressive skiing recreation) leads to an assumption that skiers' task motivation to participate in skiing training is on a much higher level than ego motivation.
2. If participation in skiing activity is perceived as a way of self-fulfillment or self-development, it can be assumed that the strongest motivation in skiers is intrinsic motivation, while the weakest one is amotivation.
3. The differences in the motivation context are significant for the examined skiers' sports results. Especially higher amotivation is supposed to predict lower effectiveness in sport performance.

Material and Methods

The study sample comprised 198 subjects chosen by way of purposive sampling, oriented to improve their skiing skills (in progressive recreation) who took part in supplementary skiing training courses in the winter of 2006, 2007 and 2008 in Karpacz, Szczyrk, Kluszkowce and Zakopane in Poland. The sample included 60 women and 138 men at the mean age of 21 years (min. 18, max 32, SD = 3.23; 20 years in the group of women, 22 years in the group of men). The subjects' average skiing experience length amounted to more than 10 years of skiing practicing.

The achievement motivation processes were examined using a measure of goal orientation consisting of task motivation and ego motivation. The measuring scales were designed on the basis of Task and Ego Motivational Orientation Scales commonly used in sport psychology [15, 17]. The task motivation scale was concerned with experiencing sport success on the basis of skills development and self-development. The ego motivational scale focused on sport success as compared with other athletes' achievements.

The sources of achievement motivation were examined with the Sport Motivation Scale (SMS) consisting of 28 items reflecting possible sources of motivation in

undertaking a specific form of physical activity. Pelletier's Sport Motivation Scale has been widely applied in the areas of sport and physical recreation, and its reliability was confirmed by its use in comprehensive research on determinants of physical recreational activities in Greece and France [12].

The study also involved an analysis of subjects' results of skiing theory and practice tests achieved during specialist skiing training courses. The skiing tasks included a technical skiing test (correct performance of selected skiing technical elements), sports test (slalom and giant slalom) and theory test. Each task was scored from 0 to 10. The assessment criteria complied with the "Training Guidelines" of the Union of Skiing Instructors and Coaches of the Polish Skiing Association.

To compare the motivational factors within subjects, a two-way Analysis of Variance with a repeated-measures design was performed, where a between-subject factor was gender, and investigated motivational factors were the within-subject factors. Pearson's *r* coefficient of correlation was used to estimate the strength and direction of a relationship between motivational factors and results in skiing tests. In order to obtain the best set of predictors of performance in skiing (technical, slalom, theory and total results), a stepwise forward selection regression method was employed [24]. All statistical calculations were made with the use of Statistica 9.0 software package.

Results

The components of the research area in the present study included goal orientation of motivation in physical activity (task motivation and ego motivation) and sources of motivation in sport (intrinsic motivation, extrinsic motivation and amotivation).

Firstly, the skiers who participated in the study were compared in terms of their levels of task motivation and ego motivation (Fig. 1). The participating skiers showed a considerably higher level of task motivation ($M = 4.59$; $SD = 0.51$) than ego motivation ($M = 2.46$; $SD = 0.88$) ($F = 799.36$; $df = 1$; $df = 194$; $p < 0.001$; effect size: $\eta^2 = 0.80$).

This finding turned out to be true both for women and men, who did not differ significantly at $p = 0.05$, with

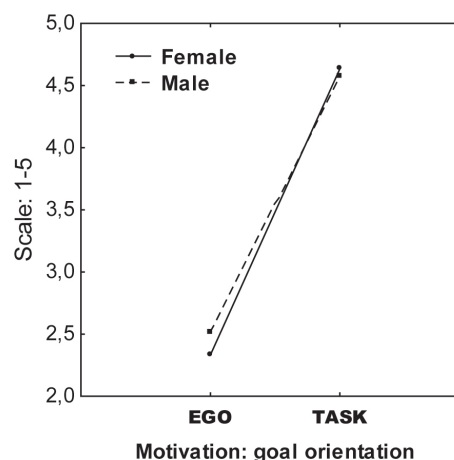


Figure 1. Achievement motivation (TASK/EGO orientation) in female and male progressive recreational skiers

the investigated motivational factors considered ($F = 0.61$; $df = 1$; $df = 194$; $p > 0.05$; effect size: $\eta^2 = 0.003$). A non-significant ($p = 0.05$) interaction effect was obtained ($F = 2.65$; $df = 1$; $df = 194$; $p > 0.05$; effect size: $\eta^2 = 0.01$).

Next, the relationships between achievement motivation and results of particular skiing tests (technical, slalom, theory, total) were analyzed (Table I). The statistical analysis revealed a positive correlation between task motivation and results of the technical skiing tests in the male skiers (0.17^*) and with a total result ($r = 0.18^*$). In the total sample a significant correlation was found between the results of the theory test and ego motivation (0.14^*). A similar, statistically significant correlation (0.15^*) was noted between the subjects' theory test results and total motivation.

Then, a stepwise forward selection regression method was employed. None of the models were found to be statistically significant for the female group ($p > 0.05$), and the investigated factors accounted only for a very small part of variance in skiing performance.

Next, in the male group, the contribution of motivational factors to the results in a technical skiing test was analyzed. The model obtained a statistical significance ($F(1.135) = 3.98$; $p < 0.05$). Task motivation, added to the model in the first step, that accounted for about 3% of variability, turned out to be the only significant predictor of skiing test results

Table I. Achievement motivation level and skiing training effectiveness

Achievement motivation	Gender	N	Technical skiing test	Slalom test	Theory test	Total
1 Task motivation	F	60	-0.06	0.15	-0.16	0.05
	M	138	0.17*	0.09	0.14	0.18*
	F + M	198	0.11	0.10	0.07	0.09
2 Ego motivation	F	60	-0.08	0.06	0.19	0.06
	M	138	0.05	0.09	0.14	0.09
	F + M	198	0.02	0.09	0.14*	0.09
3 Total motivation	F	60	-0.11	0.12	0.08	0.06
	M	138	0.12	0.12	0.19	0.13
	F + M	198	0.06	0.12	0.15*	0.11

* $p < 0.05$

Table II. Regression models: The “best” set of predictors (ego, task orientation) of results in particular skiing tests attained with the stepwise forward selection regression method (presentation of statistically significant models only)

dependent variable: technical skiing test (male group) R ² = 0.029, Adj. R ² = 0.021, F(1.135) = 3.984, p < 0.048			
	β	Se. β	p
TASK	0.17	0.08	0.048
dependent variable: total skiing test (male group) R ² = 0.033, Adj. R ² = 0.026, F(1.135) = 4.636, p < 0.033			
	β	Se. β	p
TASK	0.18	0.08	0.033
dependent variable: theory skiing test (whole group) R ² = 0.020, Adj. R ² = 0.015, F(1.194) = 3.896, p < 0.0498			
	β	Se. β	p
EGO	0.14	0.07	0.050

β – standardized coefficient Se. β – standard error of β p – p-value

(Table II). The models for variable slalom and variable theory were not statistically significant in the group of male students ($p > 0.05$).

The statistical significance was obtained for the total results in the male group ($F(1.135) = 4.64$; $p < 0.05$). Task motivation added to the model in the first step accounted for about 3% of variance (Table II). Ego motivation added in the second step did not increase the R². In the context of the whole group of participants regression models used for technical, slalom and total results skiing tests did not attain statistical significance.

On the other hand, a regression model for the skiing theory test (for the whole group) was statistically significant ($F(1.194) = 3.90$; $p < 0.05$), where ego motivation, added in the first step, explained about 2% of variance (Table II).

Next, the skiers were compared in terms of intrinsic and extrinsic motivation as well as amotivation (Fig. 2). The recreational skiers differed significantly among themselves with regard to the sources of motivation ($F = 1005.72$; $df = 2$; $df = 378$; $p < 0.001$; effect size: $\eta^2 = 0.84$). This finding was true for both women and men, who in terms of the explored motivational factors did not differ significantly ($F = 0.64$; $df = 1$; $df = 189$; $p > 0.05$; effect size: $\eta^2 = 0.003$).

Overall, the studied group of skiers turned out to have mainly an intrinsic source of motivation ($M = 5.99$; $SD = 0.69$), a lesser extrinsic source of motivation ($M = 4.38$; $SD = 1.02$), and the least amotivation ($M = 1.75$; $SD = 0.98$) (post-hoc HSD Tukey test for pair-wise comparisons: $p < 0.001$). No significant interaction effect was noted ($F = 0.38$; $df = 2$; $df = 378$; $p > 0.05$; effect size: $\eta^2 = 0.002$).

The results of statistical analysis in the studied group of progressive recreational skiers also revealed different correlations between the source of motivation and their effectiveness of skiing training (Table III).

In the statistical analysis extrinsic motivation revealed the largest number of positive correlations with subjects' skiing training effectiveness. The data from Table III show that the results of the slalom test and theory test are positively correlated with the level of extrinsic motivation for the total sample. The strongest correlation was found between extrinsic motivation and the total results and theory test results in the studied group of women (0.27*). The level of intrinsic motivation was positively correlated with the women's slalom test results. Negative correlations were found between amotivation and training effectiveness – a statistically significant correlation was found

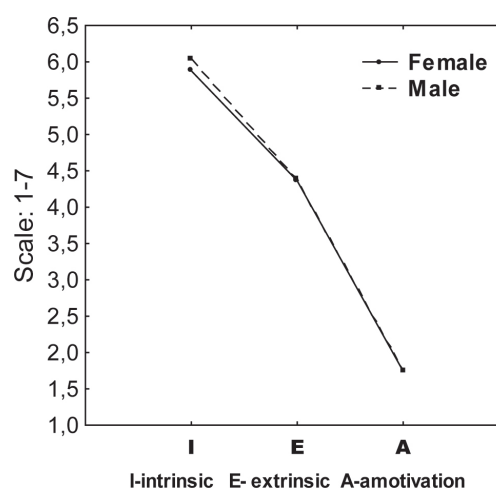


Figure 2. Intrinsic motivation, extrinsic motivation and amotivation in female and male progressive recreational skiers

Table III. Motivation sources and skiing effectiveness

Motivation	Gender	n	Technical skiing test	Slalom test	Theory test	Total
1 Extrinsic motivation	F	60	0.23	0.25	0.27*	0.27*
	M	138	0.00	0.09	0.12	0.05
	F + M	198	0.07	0.14*	0.16*	0.12
2 Intrinsic motivation	F	60	0.07	0.31*	-0.02	0.23
	M	138	0.07	0.02	0.15	0.04
	F + M	198	0.08	0.12	0.08	0.11
3 Amotivation	F	60	-0.24	-0.41**	-0.09	-0.39**
	M	138	-0.13	-0.07	-0.11	-0.14
	F + M	198	-0.16*	-0.16*	-0.11	-0.21**

* $p < 0.05$, ** $p < 0.01$

between amotivation and all test results except for the theory test. The studied women scored lower in all tests (-0.39^{**}) and slalom test (-0.41^{**}), when they displayed a higher level of amotivation. This correlation was not found, however, in the studied men. The observed negative correlations between amotivation and training effectiveness in the total sample (-0.21^{**} in all tests and 0.16^* in technical skiing and slalom tests) can be explained by the fact that the studied women featured a high level of these correlations. The obtained results indicate that the level of extrinsic motivation has a significant impact on skiing training effectiveness, which is related to task motivation. The amotivation level is significantly correlated with lower test results of female skiers in particular, who also revealed a correlation between high slalom test scores and intrinsic motivation (0.31^*).

Then, regression models were analyzed. None of the models reached the statistical significance at $p = 0.05$ in the group of men. In the group of women, firstly, a regression model for the technical skiing test was presented. Statistical significance was obtained for the model with two predictors ($F(2.55) = 4.39$; $p < 0.05$): amotivation (Beta = -0.29 ; $p < 0.05$) and extrinsic motivation (Beta = 0.27 ; $p < 0.05$). These predictors explained together about 14% of variance. Amotivation that was added in the first step accounted for about 6.5% of variance, whereas extrinsic motivation, added in the second step, increased this rate for about 7.3% (Table IV).

Then, the contribution of the predictors to the slalom test in the female group was analyzed. The model attained the assumed statistical significance ($F(2.55) = 10.54$; $p < 0.001$). In the final model both amotivation (Beta = -0.46 ; $p < 0.001$) and extrinsic motivation (Beta = 0.32 ; $p < 0.01$) were found. These predictors explained together about 28% of variance. Amotivation, added to the model in the first step, accounted for about 18% of variance, whereas external motivation, added to the model in the second step, increased this rate for about 10% (Table IV).

Next, the contribution of the predictors to the theory test in the female group was analyzed. The regression model with one predictor reached the assumed level of statistical significance ($F(1.56) = 4.31$; $p < 0.05$). External motivation, added in the first step, explained about 7% of variance in the results of theory test (Table IV). The addition of the other predictor did not increase the R^2 .

Then, an analysis was carried out to estimate the contribution of the predictors to the total results in skiing tests in the female group. The regression model with two predictors attained statistical significance ($F(2.55) = 10.60$; $p < 0.001$): amotivation (Beta = -0.43 ; $p < 0.001$) and extrinsic motivation (Beta = 0.37 ; $p < 0.01$). These two predictors explained together 28% of variance. Amotivation, added to the model in the first step, accounted for about 14.5% of variance, whereas extrinsic motivation added in the second step increased the explanation of variance for about 13.5% (Table IV).

Next, the contribution of the predictors to the technical skiing test results in the whole studied group was estimated and analyzed. The model was statistically significant ($F(1.189) = 5.74$; $p < 0.05$). However, statistical significance at

Table IV. Regression models: The "best" set of predictors (IM, EM, AM) of results in particular skiing tests attained with the stepwise forward selection regression method (presentation of statistically significant models only)

dependent variable: technical skiing test (female group) $R^2 = 0.138$, Adj. $R^2 = 0.106$, $F(2.55) = 4.395$, $p < 0.017$				
	β	Se. β	p	ΔR^2
AM	-0.29	0.13	0.024	6.5%
EM	0.27	0.13	0.036	7.3%
dependent variable: slalom skiing test (female group) $R^2 = 0.277$, Adj. $R^2 = 0.251$, $F(2.55) = 10.537$, $p < 0.000$				
	β	Se. β	p	ΔR^2
AM	-0.47	0.12	0.000	17.7%
EM	0.32	0.12	0.008	10.0%
dependent variable: theory skiing test (female group) $R^2 = 0.072$, Adj. $R^2 = 0.055$, $F(1.56) = 4.312$, $p < 0.0424$				
	β	Se. β	p	ΔR^2
EM	0.27	0.13	0.042	7%
dependent variable: total skiing test (female group) $R^2 = 0.278$, Adj. $R^2 = 0.252$, $F(2.55) = 10.605$, $p < 0.000$				
	β	Se. β	p	ΔR^2
AM	-0.43	0.12	0.000	14.5%
EM	0.37	0.12	0.002	13.5%
dependent variable: technical skiing test (whole group) $R^2 = 0.029$, Adj. $R^2 = 0.024$, $F(1.189) = 5.740$, $p < 0.018$				
	β	Se. β	p	ΔR^2
AM	-0.16	0.07	0.018	3%
dependent variable: slalom skiing test (whole group) $R^2 = 0.588$, Adj. $R^2 = 0.049$, $F(2.188) = 5.869$, $p < 0.003$				
	β	Se. β	p	ΔR^2
AM	-0.19	0.07	0.007	3.3%
EM	0.17	0.07	0.021	2.5%
dependent variable: theory skiing test (whole group) $R^2 = 0.026$, Adj. $R^2 = 0.021$, $F(1.189) = 5.144$, $p < 0.025$				
	β	Se. β	p	ΔR^2
EM	0.16	0.07	0.025	3%
dependent variable: total skiing test (whole group) $R^2 = 0.091$, Adj. $R^2 = 0.081$, $F(2.188) = 9.427$, $p < 0.000$				
	β	Se. β	p	ΔR^2
AM	-0.24	0.07	0.000	5.0%
EM	0.20	0.07	0.004	4.0%

β – standardized coefficient, Se. β – standard error of β p – p-value
IM – intrinsic motivation, EM – extrinsic motivation, AM – amotiva

$p = 0.05$ was only attained by amotivation, added in the first step, explaining about 3% of variance (Table IV).

Then, the contribution of the predictors to the slalom test results in the whole group was estimated. The studied variables accounted for about 6% of slalom test results ($F(2.188) = 5.87$; $p < 0.01$). In the final model both amotivation (Beta = -0.19 ; $p < 0.01$) and extrinsic motivation (Beta = 0.17 ; $p < 0.05$) were found. Amotivation, added to the model in the first step, explained about 3.3% of variance. Extrinsic motivation, added in the second step, increased explained variance for about 2.5% (Table IV).

A similar finding was obtained for theory test results in the whole group, where the regression model also reached the assumed statistical significance $F(1.189) = 5.14$; $p < 0.05$). However, extrinsic motivation (added in the first step) turned out to be the only statistically significant predictor explaining about 3% of variance (Table IV).

As regards the total skiing test results for the whole group, the model achieved statistical significance $F(2.188) = 9.43$; $p < 0.001$) with two predictors found: amotivation (Beta = -0.24 ; $p < 0.001$) and extrinsic motivation (Beta = 0.20 ; $p < 0.01$). These predictors accounted for about 9% of variance. Amotivation, added to the model in the first step, explained about 5%, whereas extrinsic motivation, added in the second step, made this rate increase for about 4% (Table IV).

Discussion

The analysis of motivational processes in the studied skiers is an important contribution to the knowledge of the characteristics of these processes and permits an examination of the formulated research hypotheses. The initial assumption about the existence of significant differences in task motivation and ego motivation in skiers under study was confirmed. The skiers do not expect sheer rivalry nor are they motivated by a simple desire to be better than others. They took the skiing tests in order to execute them correctly rather than to overcome other competitors. A much higher level of task motivation to participate in skiing training than ego motivation was noted in the studied skiers. It is also an important observation in the context of adjustment of task difficulty to the skiers' skills, participation in progressive skiing recreation and identification with goals/tasks set by training instructors [17, 22, 25].

The study results also confirm the hypothesis that the fundamental source of motivation in skiers is intrinsic motivation, while the least significant is amotivation. The voluntary character of recreational skiing as well as absence of external rewards (medals, trophies) are determinants of participation of skiers in training programs, who treat their sport practice as fun, passion and way of life, i.e. are intrinsically motivated. In this way training instructors should also treat the goals established for their trainees [8, 13]. The revealed differences in the motivational context are significantly correlated with the skiers' training effectiveness; while the observed high level of amotivation can be a significant predictor of failure in skiing tests. The question remains whether similar correlations can be found in practitioners of other sports, and whether their skills level (higher in competitive sports, lower in recreational sports) is also correlated with different types of motivation [3, 12]. The present study can certainly contribute to further, more extensive research in this area.

We can only assume that the communication in coach-athlete or teacher-student relations would be more effective, if coaches or teachers could relate to their athletes or students in accordance with the characteristic types of motivation to enhance their commitment to the taught subject or sport and strengthen their satisfaction of performance despite demotivating failures [7, 9].

Conclusions

1. Achievement motivation in skiers is mostly conditioned by their task motivation, rather than ego motivation, regardless of gender. It can be assumed that practicing skiing might be related to the practitioners' seeking objective indices of assessment of their effectiveness.

2. The obtained results indicate that task motivation is conducive to attainment of better results in technical skiing tests, while ego motivation to scoring higher in skiing theory tests. A positive correlation was found between the level of achievement motivation in studied skiers and their theory test results, and between task motivation and the technical skiing test results in men.

3. The most significant source of motivation for skiers, regardless of their sex, is intrinsic motivation; the least significant is amotivation. This indicates the skiers' high awareness of goals and determination in attaining them.

4. A high level of intrinsic motivation is a positive factor influencing the effectiveness in skiing, especially in female skiers in their sports tests (slalom), while a higher level of extrinsic motivation is positively correlated with the results of theory tests. Amotivation can seriously lower the effectiveness in skiing in female skiers and in the total study sample, which could be important information in planning skiing training and the ways of enhancing female skiers to maintain progress in their skiing abilities.

5. According to the regression model motivational predictors (intrinsic motivation, extrinsic motivation, amotivation) accounted only for a very small part of variance in performance in skiing within the male group. Among the female skiers, a significant impact on skiing effectiveness was made by amotivation (negative impact) and extrinsic motivation (positive impact) in respect of the significant relationship between the intrinsic motivation level and slalom scores in skiing tests obtained by women.

6. With the basic knowledge of motivational processes a skiing instructor or coach should be able to adjust achievement motivation accounting for the negative and positive influence of its components (intrinsic motivation, extrinsic motivation, amotivation) on the effectiveness of skiing training.

7. While studying determinants of sport success it should be remembered that athletes' psychical strength should rely not only on the pursuit of victory but primarily on their satisfaction of development of sports skills and career without losing the sheer joy of sport.

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