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Motivation in table tennis

Abstract

Motivation for sport activities has become very popular area in the field of sport psychology. Researchers are trying to find the basic determinants of motivation for physical activities. Some very interesting problems have occurred since they did not separate the phenomena of level of involvement in sport quite exactly. Some of the researchers have researched top sports, others college sports or other forms of fitness and recreation activities. Their approaches are mostly also very partial and just directed in investigating localised problems. But the motivation is very wide. We are trying to see motivation as very complex phenomena, which must be researched freely with all its correlating variables.

Motivation variables of elite Slovenian athletes and young Slovenian athletes (age 12-14) in 9 different sport disciplines have been obtained, among them also table tennis. Motivation included achievement motivation, incentive motivation, participation motivation, goal orientations, satisfaction and enjoyment in sport, self-efficacy, effort and ability attributions etc. The most popular framework for motivation in sport at the moment is social cognitive perspective. The aim of this study was to form a dynamic interactive model of sport motivation. We tried to upgrade different models of motivation to one unique model, which would explain all possible behaviours and motivation in sport situation.

Success in competitive sports depends mostly on athlete's skills, personality and motivation. Motivation became very popular lately in the last two decades and many of researches were conducted to investigate determinants of motivation. The presence of "zeitgeist" social cognitive perspective in psychology has changed the view on motivation for sport. On the base of these results we established the model of motivation, which helped us to improve motivation and which can be also implemented in table tennis.

Key words: *motivation, elite sport, incentive motivation, nAch, goal orientations, participation motivation, model of sport motivation*

INTRODUCTION

Success in competitive sports depends mostly on athlete's skills, personality and motivation. Motivation became very popular lately in the last two decades and many of researches were conducted to investigate determinants of motivation. The presence of "zeitgeist" social cognitive perspective in psychology has changed the view on motivation for sport. Social cognitive approaches became the main framework for investigation of sport motivation. Social cognitive prospective started with the work of Weiner (1971) and is built around expectancies and values, that individuals attach to

different goals and achievement activities. Today, we can divide the social cognitive approach to three mini theories:

- the theory of self-efficacy (Bandura, 1977, 1986)
- the theory of perceived competence (Harter, 1980) and
- the theory of goal perspectives (Nicholls, 1981, 1989; Dweck, 1986; Maehr & Braskamp, 1986).

The motivation is very wide. We are trying to see motivation as very complex phenomena, which must be researched freely with all its correlating variables. Self-efficacy (Bandura, 1977, 1986) is a common cognitive mechanism for mediating athlete's motivation, thought patterns and behaviour. Self-efficacy construct has been used to explain achievement behaviour in sport. Self-efficacy beliefs and expectations are defined as *athlete's judgments of their capability to perform at certain levels. It is a conviction that an athlete needs to successfully execute the behaviour necessary to produce a certain outcome. It is athlete's assessment what he/she can do with his/her ability*. Different studies indicate that self-efficacy has a positive effect on performance in individual sports (Feltz, 1982; Lee, 1988), in muscular endurance tasks (Weinberg and coll., 1981), but it is a question of relation between self-efficacy and collective efficacy and collective performance in group sports.

Harter (1981) tries to explain why people want to participate in achievement situation. A prediction of Harter's model is that children who perceive themselves competent in sport should be likely to participate in sport. Roberts and coll. (1981) and Feltz & Brown (1984) found this relationship very weak, so Roberts (1992) suggests that there are many different reasons for children's participation in sport.

Participation and persistence in sport, the choice and intensity of training and participating are goal directed (Duda, 1992). The goal is subjective and the effect of multiplicity of different goals is presented in the process of motivation. The success and failure in the performance are not always defined according to wining or losing in the competition (Maehr and Nicholls, 1980). There are two major goal perspectives or ways of defining success:

- task involvement or goal orientation (the focus is on learning, improvement and meeting the demands of the activity: "trying to do athlete's best", "to perform perfect" etc. to reach personal goals, where perceived competence is self-referenced and the subjective experience of personal improvement and task mastery defines success),
- ego involvement or win orientation (the focus is on wining, "being the best" and showing the superiority over others is the primary goal; perceived competence is normatively-referenced and depends on comparison of one's ability to others).

According to Nicholls (1989), the major goal of achievement behaviour is to demonstrate ability and avoid the demonstration of low ability. The development of task and ego goals is a direct result of an emerging capacity to differentiate ability from effort as causal attribution of success and failure.

Task goals are related to mastery, co-operation, sportsmanlike behavior, enjoyment and the belief that *effort* lead to success in sport (Duda & Nicholls, 1992). Ego goals are related to unsportsmanlike behavior, aggression and the belief that high ability leads to success (Duda and White, 1992).

Socialization appears to be the most determining factor of athletes' ego and task involvement. The parents and coaches become very important in building motivational climate (Roberts, 1984, 1992), which directs athlete's goal perspectives. The sport setting is characterized by an increasing emphasis on competitive outcomes and normative ability as the athlete moves through the sport system (from junior to top athlete). Achievement orientation is a function of both development differences and situational constraints (Duda, 1992).

The participation motivation approach is focused on the reasons why people engage in sport and continue in their athletic participation (Gill, Gross & Huddleston, 1980; Gould, Feltz & Weiss, 1985). Different researchers have found mainly 5 to 8 primary goals or incentives for participating in sport. These are: achievement, team, friendship, fitness, energy release, skill development and fun. Nicholls theoretical work (1989) suggests that there is a link between goal orientations and participation motives. Dispositional goal perspective that an athlete brings to a particular situation will impact on athlete's motivation. Susan Butt (1979, 1985 and 1987) constructed a similar measurement to assess various motivational and personality dispositions in sport. It associates scales for aggression, conflict, competence, competition and co-operation as the important reasons of motivation in sport.

In this study we tried to form a dynamic interactive model of sport motivation. We tried to upgrade different models of motivation to one unique model, which would explain all possible behaviours and motivation in sport situation.

METHOD

Sample:

The sample included all together 360 Slovene athletes. 170 athletes were between 17 and 30 years old (representatives of Slovenian national teams in basketball, football, handball, ice hockey, water polo, table tennis, ski jumping, alpine skiing, sport climbing, judo) and 190 boys between 12 and 14 years, young perspective athletes, who practice and train their sport in sport clubs at least three years. Four main sub samples have been made: top athletes in individual sports (TI) (N=80), top athletes in group sports (TG) (N=90), young athletes in individual sports (YI) (N=70) and young athletes in group sports (YG) (N=120).

Instruments*:*

Many different motivational variables have been measured through the following instruments:

1.Perceptions of demostrated ability, effort and self-efficacy (Tušak, 1997)
2.Sport satisfaction and enjoyment (Tušak, 1997)
3.Expectations of results and success (Tušak, 1997)
4.Sport Attitudes Inventory (Willis, 1982)
5.Costello (1967) nAch questionnaire
6.Sport Orientation Questionnaire (Gill, Deeter, 1988)
7.Sport Motivation Scales (Butt, 1979)
8.Self Motivation Inventory (Dishman, Ickes & Morgan;1980)
9.Task and Ego Orientation Sport Questionnaire (Duda, 1989)
10. Scale of motives for competition (Youngblood in Suinn, 1980)
11. Participation Motivation Questionnaire (Gill, Gross &Huddleston, 1983)

Procedures:

Subjects were requested to complete questionnaire items after the investigator had read the instructions. Analysis of variance were used for investigating differences between groups, discriminant analysis were used to establish differentiation model of motivation and factor analysis were used to set the model of motivation in sport.

RESULTS

Discriminant analyses were made. Reduced set of following variables were put into the analysis: ability and effort attribution of success (**ABILITY**), goal orientations (ego and task orientation, win and goal orientation) (**EGO ORIENT., TASK ORIENT, WIN ORIENT., GOAL ORIENT**.), competitiveness (**COMPETITIV**), nAch motivation (need to achieve success with work or no matter of work) (**+nAch, -nAch**), achievement motivation for competition **(MAS, MAF, POWER** motive), self-motivation (**SELF-MOTIV**), self-efficacy expectations (**SELF-EFFICACY**), success and result expectations (**EXPECT.SUCCESS**), general and specific participation motivation (**GENERAL I., SPECIFI I.),** total score of motivation for competition (**TSMC**), total score of motivation from 5 different sources on Sport Motivation Scales (**TSSMS**), sport satisfaction and enjoyment (**ENJOYMENT, SAT**).

Table 1: *Canonical discriminant functions*

Fkc	Eigen value	Pct. Var.	Cum Pct	Canon. korr.	Fkc	Wilks' Lambda	hi-sq.	dF	sig.
					: 0	.166964	553.10	162	.000*
1*	1.5214	57.69	57.69	.7768	: 1	.420976	267.34	106	.000*
2*	.7842	29.74	87.43	.6630	: 2	.751124	88.43	52	.001*
3*	.3313	12.57	100.00	.4989	:				

Table 2: *Structure matrix*

	Function 1	Function 2	Function 3
ENJOYMENT,SATISF.	.48677*	-.10544	.38422
TSSPS	.39672*	-.19330	-.36987
TSMC	.39014*	.07771	-.02267
MAF	.21718*	-.09374	-.15156
SELF-MOTIV.	-.20962*	-.17793	.05677
TASK ORIENT.	.11085*	.03913	.05779
MAS	.09082*	.01218	.08044
WIN ORIENT.	-.01330	-.46297*	-.24388
EGO ORIENT.	.07343	.43211*	-.03300
GENERAL I.	-.24869	.31456*	-.01018
COMPETITIV.	.02047	-.23558*	-.10091
+nAch	-.02167	.11644*	-.00808
POWER	-.07769	-.11193*	-.03731
ABILITY	.03800	.09608*	-.04903
SELF-EFFICACY	.14825	-.18373	.47440*
GOAL ORIENT.	-.02043	.09010	-.32096*
SPECIFIC I.	-.07897	-.01931	.30481*
-nAch	.11212	-.01492	.26141*
EFFORT	-.08817	-.04528	.13845*
EXPECT.SUCCESS	.06401	.04887	.09845*

Table 3: *Group centroids and canonical discriminant functions*

Group	Function 1	Function 2	Function 3
YG	1.09825	-.26010	-.22630
YI	.35040	.71670	.58227
TG	-.92509	-.77231	.24975
TI	-.97494	.57201	-.44771

Table 4: *FA of reduced set of motivation variables (PC analysis, varimax rotation)*

Factor	Eigen Value	% of Var.	Cum. % of Var.
Intrinsic achievement motivation	5.48	27.4	27.4
Self-regulatory mechanism, cognitive mediators of motivation	2.15	10.7	38.2
Achiev. orientation, personal characteristics of Ach. behavior	1.42	7.1	45.2
Extrinsic achievement motivation	1.27	6.3	51.6
Incentive system of general motivation	1.08	5.4	57.0
Incentive system of specific motivation (ind.m. and thrill exp.)	1.01	5.1	62.0

Table 5: *Saturation of factors with manifest motivation variables (only correlation coefficients > 0,40)*

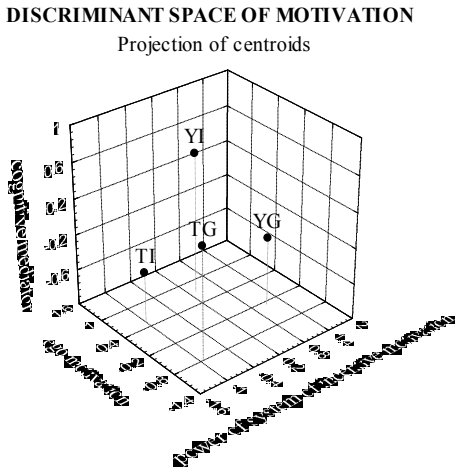
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
SELF-MOTIV.	0.77					
+nAch	0.73					
POWER	0.61					
MAS	0.59					
EFFORT	0.55	0.42				
TASK ORIENT.	0.49				0.43	
SELF-EFFICACY		0.81				
ENJOYM.,SATIS.		0.79				
EXP.SUCCESS		0.67				
ABILITY		0.58				
WIN ORIENT.			0.80			
COMPETITIV.			0.79			
GOAL ORIENT.			0.77			
TSSMS				0.68		
MAF				0.68		
-nAch				0.66		
EGO ORIENT.				0.52		
TSMC				0.38		
GENERAL I					0.83	
SPECIFIC I.						0.85

DISCUSSION

Analysis of univariate differences showed the existence of important differences among all four groups of athletes in self-efficacy, win orientation, ego orientation, negative nAch motivation, self-motivation, enjoyment, and specific factor of participation motivation, total scores of motivation for competition and in 5 subscales.

Discriminant function 1 includes motivation, which originates from incentive systems that are very attractive, important and useful for athletes. It is their intensity and their power, which is important for an athlete. These attractive motives stimulate athlete's activities. Discriminant function 1 includes also negative nAch motivation and enjoyment in sport, but on the other side it indicates the absence of self-motivation and inherent control in motivation process. First discriminant function indicates on the "pull motivation", like attractive incentive systems, the usefulness of motives for competition, feeling of some emotions and expressing some personal dispositions. We could name the first function **the power of incentive motivation**. The second discriminant function includes general participation motivation (fitness and recreation motives, development of abilities, success and achievement, health, progression motives and challenge, team atmosphere and friendship), ego orientation and positive nAch motivation, but on the other side the absence of win orientation (which is related to group tasks and group directed goals and activities, such as co-operation) and competition. We can name this function **Ego motivation.** We found the most

important correlations of third function with self-efficacy, total score of enjoyment in sport and specific motives for participation (motives to experience thrill, arousal and individuality) and expectancies of success (in present and in the future). On the other hand, the function is negatively correlated with goal orientation and motives for power. The function could be named **Cognitive mediators** of motivation.



Picture 1: *Projection of centroids for groups in 3 dimensional discriminant space of motivation*

Function *the power of incentive motivation* discriminates the most between young athletes in group (YG) and individual sports (YI) on one side (highly expressed) and top athletes in individual (TI) and group sports (TG) on the other side (less expressed). Function *ego motivation* discriminates between athletes in individual sports (TI and YI with high scores) and athletes in group sports (TG and YG with low score). It is quite hard to find an explanation for discrimination of function 3 *(cognitive mediators).* TI and YG reach higher results than YI and TG.

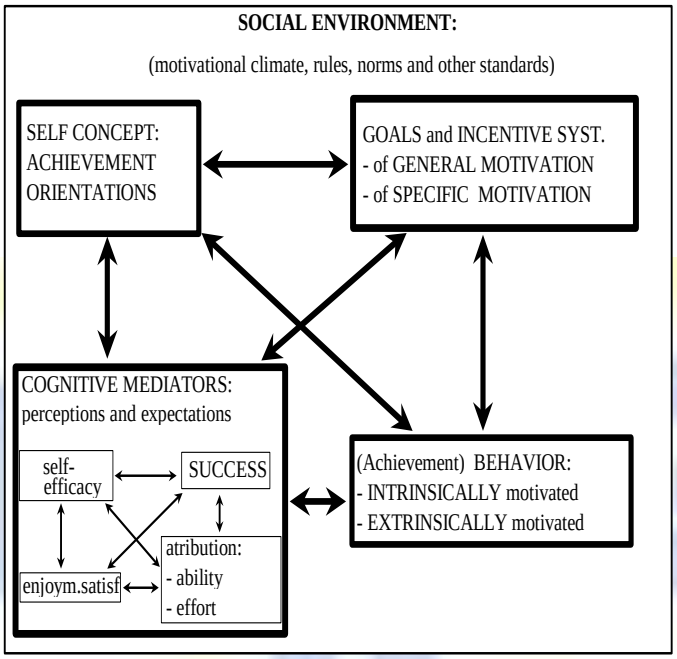
Analysis of motivational structure gave us quite clear model. The first factor represents the most positive component of motivation in sport. The aim of such motivation is to achieve success. An athlete is aware that sport results depend on athlete's hard work and effort. Such an athlete is motivated by hard work (which he/she invests into the practice and competition), by progress, learning and development of abilities. Such an athlete has a strong intrinsic control and is self-motivated and goal oriented, he is also motivated by the possibility to influence other participants in sport. This factor could be named **intrinsic (positive) achievement motivation** (Atkinson, 1964; Weiner, 1972). Results showed that this factor is the most important factor of motivation in sport as it explains almost 30 % variance. This intrinsic achievement motivation is also the most self-determined (Deci and Ryan, 1991).

Second factor includes variables related to mediators of motivation. The role of self-efficacy as the mediator in the process of motivation was mentioned by many researchers (Locke, Motowidlo and Bobko, 1986; etc.). Higher degree of self-efficacy leads to stronger goal setting and searching for

more challenging goals which dictate stronger motivation. Even Bandura (1986) inside his concept of cognitive motivation, which is goal oriented, located self-efficacy in the sphere of mediator. Very similar approach was used for explaining motivation in sport by Dzewaltowski (1994) with his concept of sport enjoyment and satisfaction in sport as one of the cognitive mediators of motivation. Satisfaction and enjoyment represent the emotional self-evaluation which is one component of self-regulatory influences (Bandura, 1989). Self-regulatory influences and experienced satisfaction in sport are important motivators in sport (Scanlan, 1989; Wankel, 1993). Especially Bandura (1989) and Dzewaltowski (1994) suggest that anticipating sport satisfaction and enjoyment (which go together with reaching athlete's goals) have a strong impact on athlete's self-regulation. Inside the concept of self-regulation constructs we can find also the attributes of success (ability and effort perceptions). Nicholls (1984) emphasizes self-concept of ability, Harter (1981), Maehr & Braskamp (1986) about perceived competence, Bandura (1977, 1989) about self-efficacy. Attributes of success represent the central mediator process in motivational situation. Cognitive representations of all those mentioned concepts of the second factor participate in athlete's self-regulation process of motivation. This second factor represents Bandura's (1989) construct of self-efficacy expectations and cognitions related to self-reactive influences in the context of process of self-regulation. We should not forget the expectancies of success, which represent one of the three basic cognitive processes related to sport activities (Bandura, 1992), and impacts athlete's perceptions of self-efficacy and competence (Tušak, 1997). This factor could be understood as **self-regulatory skills, self-reactive influences or cognitive mediators of motivation.** Higher values on the second factor (Bandura, 1986) result in higher motivation behaviour. High self-efficacy, clear expectations of results and defined attributes of success lead to optimal cognitive motivation, which dictate endurance in training and sport behaviour (Weinberg, Gould & Jackson, 1980).

The third factor includes variables related to personal dispositions of achieving success. It represents athlete's achievement orientations in sport and training activities. We named the factor **achievement orientations** or **personal characteristics of achievement behavior**. It includes competitiveness, which discriminated between athletes and non-athletes (Gill & Dzewaltowski, 1988), win orientation (includes tendency to win in interpersonal competition) and tendency to reach important personal goals through participation in sport (goal orientation). Inside the concept of social-cognitive prospective (Bandura, 1986 and Dzewaltowski, 1994) we can find achievement orientations as personal determinants of sport activity, which were researched also by Dishman (1980) concept of self-motivation. Achievement orientations are personal characteristics, but they are also affected by motivational climate, which represents athlete's social environment and the influences of athlete's process of socialization. The structure of fourth factor is quite unclear. It includes negative achievement motivation, ego orientation and total scores of incentive systems. It suggests a kind of **external and extrinsic achievement motivation**. Externally motivated athletes are motivated with the fear of failure, they are ego oriented and they do not take care much about their own improvement and hard work. In the

context of self-determined continuum (Deci in Ryan, 1991) such motivation lies somewhere on the lower level (Vallerand and others, 1993). The fifth and the sixth factor represent the attractiveness of incentive systems in sport. Fifth factor is called **incentive systems of general motivation** and includes attractiveness of all basic participation motives (achievement, recreation, skill development, group atmosphere etc.), which motivate most of the athletes. Sixth factor is named incentive **systems of specific motivation** and include motive to experience thrill and excitement. Inside Bandura's interactive model (1986) both factors represent the incentive systems of social environment, which could be understood as athlete's "pull" motivation (Tušak, 1997).



The analysis of scree test suggests two or three factors solution. But 6-factor solution was really interesting and it would be very interesting to think about a suggestion offered by this model, that intrinsic and extrinsic motivation should be understood as two different dimensions of motivation and not just two ends of the same dimension. Results confirm that there is a possibility that an athlete expresses high or low scores on both dimensions at the same time. Very important in the present model is the dimension of cognitive process mediators, which touches personal inclinations to different evaluation of success on the competition and different evaluation of relation result-goal-success. The attractiveness of incentive systems of environment is suggested with 5.th and 6.th factor and include general participation motives and specific motives which are very characteristic for extreme and high taking risk's sports (mountain climbing, ski-jumping, alpine skiing etc.).

On the base of present results we made a contemporary model of motivation in sport, which can be also implemented in table tennis. The structure of the model should also be interpreted with the help of results from discriminant analysis, which confirm some of the differences between top and young athletes. The reasons for the differences could be found in different sport climate inside top and inside young sport, so there is a question if we

can talk about top and youth sport together. On the other side, we should try to find a way to upgrade different models of motivation to one unique model, which would explain all possible behaviours and motivation in sport situation. The present model should be researched inside social-cognitive perspective, inside achievement motivation approach and inside interactive dynamic process of all motivational determinants in future.

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