ORIGINAL ARTICLE

Motivation in judo: rethinking the changes in the European society

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Abstract

Background and Study Aim: Many socio-economic changes have taken place in Poland in the last 25 years. The aim of the study is the results of long-term observations of changes occurring in the motivation of Polish top female and male judo athletes.

Material and Methods: A cross-sectional study included a total of 102 judokas (49 females and 53 males) from the Poland national teams. They were surveyed during their competitive periods in three different time points: T1 in 1988/1989 (25 females, mean age 21.3 ±1.8 years, and 25 males, mean age 23.4 ±2.1 years); T2 in 2002 (11 females, mean age 22.6 ±1.7 years, and 9 males, mean age 23.8 ±1.9 years); and T3 in 2014 (13 females, mean age 23.7 ±2.8 years, and 19 males mean age 23.7 ±2.4 years). A Polish version of a nine-factor *Motivation Questionnaire* proposed by Terry & Fowles (1985) was used at 3-time points. The gender effect was compared using one way ANOVA for each of 9 motives. Multiple sample comparison was employed for all six sub-groups of judo athletes. Effect size η^2-values were calculated.

Results: In general, women scored lower than men in stress ($\eta^2 = 0.11$) and aggression ($\eta^2 = 0.06$) motives. With regard to the gender factor, a large effect was observed for mean scores in excellence ($\eta^2 = 0.20$), stress ($\eta^2 = 0.26$), power ($\eta^2 = 0.29$), extrinsic success ($\eta^2 = 0.19$) and aggression ($\eta^2 = 0.35$). In females, mean scores were significantly different between time points of measurements for: excellence, stress, power, extrinsic success, and aggression (T1<T3) whereas in males for: excellence (T2<T3), independence (T<T3), power (T1<T3, T2<T3), extrinsic success (T1<T3), and aggression (T1<T3, T2<T3).

Conclusions: Social changes might affect the structure of motivation in judokas. In training, individual differences should be taken into consideration to meet particular needs of the athletes, thereby ensuring their good functioning in and outside sports environment.

Keywords: psychological preparation • motivation principle • satisfaction • social change • values • wellness

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INTRODUCTION

Psychological preparation – mental preparation in which competitors learn how to deal with psychological stresses and achieve an optimal level of arousal so that they will be able to perform the best of their ability [62].

Values – the accepted standards or moral principles of a person or a group. Values are similar to norms in having a moral and regulatory role, but values have a wider significance than norms in going beyond the specific situation. Values are viewed as informing norms in different contexts [62].

Motivation principle – the motivational acceptance that a certain amount of fatigue, the effort of expenditure, boredom, and discomfort need to be endured if training is to be successful [62].

Satisfaction – the sense of achievement and the fulfilment of a need. It is accepted that sport can satisfy many desires among them desire for recreation, social contact, aggression, play and self-assuredness [62].

Social change – any major alteration in the pattern of social interaction in society [62].

Wellness – a condition obtained when a person achieved the level of health which minimises the chances of becoming ill. Wellness is achieved by a combination of emotional, environmental, mental, physical, social, and spiritual health [62].

The last quarter century has seen many socio-economic changes taking place in Poland. The turning point was systematic transformation following the year 1989, whereas one of the milestones was Poland's accession to the European Union. Economic and political changes have been observed in the last years. The beginning of this transition period in Poland dates back to 1992. On May 1, 2004, ten new member states (Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovak Republic and Slovenia) entered the European Union. This transition period has been accompanied by certain phenomena. On the one hand, the evolution of the free market, competition, the pursuit of profit, and social stratification were observed. On the other hand, cultural freedom, and decentralisation of administration on a massive scale also occurred. All the functions of administration were transformed into economic calculus, which led to the commercialisation of education. The new free market culture stimulated the atmosphere of aggressive competition. Some members of society accepted an attitude of outcasts who are frustrated and oppose the accepted rules and prohibitions. Productivity became a yardstick of man, whereas fellow creatures are more and more frequently treated as rivals. Their personal pain and feelings are not important. After all, possession of tangible assets, victory, and control over others are part of human nature. Our times are characterised by aggressiveness, articulation of claims and expectations. Are we entering a world of axiological vacuum? What can we replace traditional values? We live in a civilisation of clashing cultures, which is especially clearly present in sport [1]. The postmodernist paradigm accepts individual behaviour to a greater extent. Therefore, society needs more values, which can be offered by sport [2].

Undoubtedly, sport can play an important role. It is the system of the coach's values that setting goals and formation of the athlete's attitudes depend on. As partially follows from the previous studies [3], judo has historically taught moral knowledge and values such as intelligence, superior personality, frugality, justice, fairness, patience, politeness, modesty, honesty, courage, and benevolence toward others [4, 5]. Each culture has its own values, and, when judo is practised in a country with different values from those in Japan, there is a likelihood of dilution of traditional judo values [6]. Cultural differences between Japan, Poland and the United States outweighed the common values taught through judo [7]. In opinions of outstanding coaches, very important factors in judo training that determine sports success be technical (23.4%), tactical (18.0%) and psychological (20.1%) preparation [8, 9]. In the latest approach the coaches and scientists attention is paid to the optimisation of means [10, 11], methods and forms of training [12-16], nutritional strategies [17], criteria and methods for selecting professional judo candidates [18-20]. Sport, which is one of the important spheres of life, has also been undergoing significant transformations. In this new situation, athlete's motivation is extremely important for the professional activity of the coach.

In observational studies, researchers observe behaviour patterns of individuals [21]. The feedback between the activities during training or competition and fighting regulations led to the evolution of the training systems in judo [22]. Among other things, changes occurred in judo fighting rules [23], including the reduction in the fight duration for women to 4 minutes, and, after some time, returning to the previous 5 minutes, shortening of the maximal time of pinning necessary to score *ippon* from 30 to 20 s, banning dangerous throws such as *kani basami* and *morote gari*, banning throws with grabbing the legs of the trousers or the opponent's leg such as *kata-guruma*, *kuchiki-taoshi*, *kibisu-gaeshi and sukui-nage*, increasing the upper body mass limit in weight categories, introduction of blue and white *judogi* worn by competitors, introduction of the regulations of coach behavior, electronic equipment for communication between the referee and corner judges, rules of first aid during official tournaments, excluding techniques with lower quality of performance (*koka*), excluding *chui* and *keikoku* warnings and transfer of scores to the opponent due to the penalties, introduction of the golden score i.e. extension of fight duration until the first score is awarded in this time. Consequently, the changes have occurred in training tendencies, documented by the results of laboratory tests of physical capacity [24] and during judo tournaments [25-31]. They resulted from the need for adjustment of training programs to the demands of tournament matches [8]. The above changes led to new cognitive and motivational challenges that judo athletes had to face. Also, elite judokas started to take part in competition throughout the entire season and the number of competitive days during the whole year increased remarkably [32].

Motivation is the energy which underlies all behaviours. Hence, understanding what motivates participants must be a major concern for anyone involved in organised physical activity [33, 34]. Ziv and Lidor [35] published a review of the world literature concerning the psychological preparation of judo athletes and included 18 publications of which only 3 were connected with motivation. One of them concerned an important problem of transformations in the motivation of Polish female and male athletes in the transition period 1998/1989 to 2002, when dynamic changes in the political and economic system were observed due to the attempts of Poland to enter the European Union, which succeeded in 2004. Therefore, this study represents a natural continuation of the previous study by Sterkowicz [1] concerning the results obtained in the examinations conducted in 2014 after 10-year Poland's membership in the EU. For the researchers, the interesting part was further transitions occurring in the structure of motivation. They searched for the answers to the questions whether intensification of sexual dimorphism in motivation will be observed and whether dynamics of changes in motivation demonstrated in individual dates of examinations will be similar to women and men that show a high sports skill level in judo.

The following research hypotheses were verified:

Hp.1. Gender will play a modifying role for certain motivation factors.

Hp.2. In top female and male judo athletes from Poland, whose training and peak performance was observed on three different dates of the examinations, significant changes in motivation will be observed.

The aim of the study is the results of long-term observations of changes occurring in the motivation of Polish top female and male judo athletes.

The results obtained from the questionnaire "Why do you practice sport" [36] will be presented in light of the factors identified by Alderman and Wood [37], with consideration for additional factors, such as health and fitness, extrinsic success, and intrinsic success [36]. Self-determination theory (SDT) by Deci and Ryan [38] will be used to analyse the findings obtained from the research. Self-determination theory explains the motives and sources of human behaviours. The authors of the theory identified motivation mechanisms related to well-being, learning, achievements, or personal experiences. These mechanisms are based on three sub-theories [39]:

- Basic psychological needs theory, which is comprised of the three needs: autonomy, competence, relatedness.
- Organismic integration theory (OIT), which addresses perceived locus of causality ranging from highly autonomous to highly controlling.
- Cognitive evaluation theory (CET), which describes environmental factors which make people adopt internally and externally motivated behaviours.
- The basic psychological needs theory underpins the explanation of motivation in the sports context. Three psychological needs include:
- *autonomy* expressed in internal locus of control and a sense of choice fullness;
- *competence* – the feeling of professionalism, and efficacy in person's domain;
- *relatedness* – feeling of relationships with others, e.g. teammates, coaches.

Athletes who are intrinsically motivated engage in activities for their sake, i.e. feeling of pleasure, interest, and satisfaction directly derived from participation, without the need to receive external rewards. Extrinsic motivation, on the other hand, refers to a situation where athletes engage in an activity for an instrumental purpose (extrinsic reasons), e.g. to meet their parents' wishes, satisfy coach's expectations and to obtain rewards. It seems difficult to develop and maintain intrinsic motivation, which is crucial for achieving sports mastery, particularly in the informative and controlling context of competitive sports. Furthermore, pressures to win, either resulting from others or one's ego involvement [38] are inherent in competitive settings. Athletes deal with many situations, both in competition and training sessions, which result in motivation. Professional sport is comprised of many elements of extrinsic motivation embedded in the social context. Elite athletes, however, can internalise and integrate forms of extrinsic motivation. The authors of STD argue that the level of satisfying the three needs points to the continuum from amotivation to intrinsic motivation [40].

MATERIAL AND METHODS

Participants

This observational cross-sectional study analysed a total of 102 judokas (49 females and 53 males)

from the Poland national teams. They were surveyed during their competitive period in three different time points. We gained data from 25 females in 1989/90 (aged 21.3 ±1.8 years, first time point T1) and males (aged 23.4 ±2.1 years, T1), 11 females in 2002 (aged 22.6 ±1.7 years, T2) and 9 males (aged 23.8 ±1.9 years, T2), and 13 females in 2014 (aged 23.7±2.8 years, T3), and 19 males (aged 23.7 ±2.4 years). All the athletes and their coaches expressed their consent to participate in our non-invasive examinations. The scope of the test and examinations did not go beyond standard examination within sports camp schedule of athletes and was accordant with the Declaration of Helsinki [41].

Measures

The questionnaire was filled out anonymously during a camp in the Polish Olympic Center in Zakopane. A Polish version of the *Motivation Questionnaire* Terry and Fowles [36] was used. The questionnaire contains 27 statements to which respondents referred using the scale from 0 (absolutely unimportant) to 10 (very important). Each statement was preceded by the phrase: "I participate in judo because (…)". Furthermore, using an adequate key, the answers were grouped in nine motives (each group containing three answers) [37]: *excellence* (Exc), involving opportunities to do something very well for its own sake; *affiliation* (Aff), involving opportunities for social intercourse; *independence* (Ind), involving opportunities to take control of one's own situation; *stress* (Str), involving the excitement, tension, and pressure which sport generates; *power* (Pow), particularly their attitudes interests and opinions; and *aggression* (Agg), involving opportunities to intimidate or dominate other people; success, involving the rewards sport can provide. As mentioned above, Terry and Fowles [36] subdivided success into *extrinsic success* (ExS), about money, travel and medals and *intrinsic success* (InS) – about the development of God-given talent, achieving recognition, and pleasing family and they added *health and fitness* (H&F). The results of this motivation test discriminated between the genders of people involved in combat sports and martial arts [1], age and sports skill level of hapkido athletes [42] or type of sport (aerobics, women's judo) [43], judo, karate, korfball [44] and ju-jitsu [45]. We estimated reliability (consistency) of a set of 9 motives of 32 judoists who participate in the third time point (T3) of our survey. Cronbach's alpha was 0.83 (lower confidence bound 0.75) for the instrument we used. In general, alpha values of 0.7 or higher are considered to represent a reliable set of variables.

Statistics

Data were presented as means and standard deviations. Based on the three series of measurement performed in women and men, the size, mean and standard deviation (SD) values were combined using a formula proposed by Kirkendall, Gruber, Johnson [46]:

$$Combined\ \bar{x} = \frac{\sum(\bar{x}_i \cdot n_i)}{\sum n_i} \quad (1)$$

$$Combined\ SD = \sqrt{\frac{\sum(n_i \cdot SD_i^2)}{\sum n_i}} \quad (2)$$

where: $\bar{x}i$ is the mean value for a given sample, ni is the sample size for a given sample, and SDi denotes the standard deviation for a given sample.

Gender effects were compared using one-way ANOVA for each of 9 motives. Multiple sample comparison was employed for all six sub-groups of judo athletes. ANOVA was used to find whether there were any significant differences among the means. Effect size values for the judoists from different groups were calculated for each motive using eta-squared η^2 (0.1 small, 0.06 medium, 0.14 large effect [47]). Furthermore, the multiple Bonferroni's comparison procedures was employed to determine means which were significantly different from each other. Using this method, a 5% risk of calling one or more pairs significantly different was found, with their actual difference being 0. Statgraphics Centurion 17.2 software was used for all calculations.

RESULTS

Comparison between genders showed a significant differences in *stress* ($F_{1, 100} = 12.48$, $p<0.001$, $\eta^2=0.11$ (medium effect: difference −4.1, LL= −6.40; UL= −1.80) and *aggression* ($F_{1, 100} = 6.18$, $p<0.015$, $\eta^2 = 0.06$ (medium effect: dif −2.50, LL= −4.50; UL= −0,50). Women scored worse than men in both *stress* and *aggression* motives. No significant differences (95% Bonferroni intervals) were found in other 7 factors (Table 1).

Multiple sample comparison procedure revealed no differences between testing times over the 25-year period in *health & fitness*, *affiliation* and *intrinsic success* for women. A similar result was documented in men, while *stress* additionally joined these three motives group (Table 2).

Table 1. Results of women and men in motivation questionnaire (mean and SD).

Variable (motives)	Women (n = 49)	Men (n = 53)	Variable	Women (n = 49)	Men (n = 53)
Exc	23.3 ±3.48	24.4 ±3.47	Pow	17.7 ±5.82	17.8 ±3.96
H&F	23.4 ±5.07	24.5 ±4.13	ExS	22.1 ±3.54	21.8 ±4.60
Aff	22.1 ±4.89	21.8 ±4.95	InS	17.3 ±6.16	17.1 ±4.32
Ind	23.7 ±4.52	23.2 ±4.02	**Agg***	15.5 ±5.71	18.0 ±4.41
Str*	17.2 ±6.85	21.3 ±4.76			

*significant difference

Mean score was changed significantly between gender groups in: *excellence* ($F_{5, 96}$ = 4.87, p<0.001, η^2 = 0.20 large effect in T1-T3). For women difference = –3.97, lower limit LL = –7.55; upper limit UL = –0.39. *Stress* ($F_{5, 96}$ = 6.65, p<0.001, η^2 = 0.26 large effect T1-T3). For women dif = –8.04, LL= –14.44; UL= –1.99. *Power* ($F_{5, 96}$ =7.63, p<0.001, η^2 = 0.29 large effect T1-T3). For women dif = –5.67; LL = –10.76; UL = –0.58). *Extrinsic success* ($F_{5, 96}$ =4.51, p=0.001, η^2=0.19 large effect), T-1-T3: for women dif = –4.31, LL= –8.55; UL= – 0.07) and *aggression* ($F_{5, 96}$ =10.32, p<0.001, η^2=0.35 large effect), T1-T3: for women dif = –9.24, LL= –14.47; UL= –4.01, and T2-T3: dif= –7.72, LL= –13,99; UL= –1.45).

About men, *excellence* was lower at the second time point compared to the third time point (T2-T3: for men dif = –4.58, LL= –8.82; UL = –0.34). Lower scores were revealed at the first time point compared to the third time point in *independence* (T1-T3: dif = –4.87, LL = –8.80; UL = –0.94). *Power* was lower at the first time point compared to the third-time point (T1-T3: dif = –7.47; LL= –12.00, UL= –2.93) and the second time point was lower than the third time point (T2-T3: dif = –6.83; LL= –12.85, UL = –0.81). *Extrinsic success* was lower in the first time point (T1-T3: dif = –4,07, LL = –7.84; UL = –0.30). Furthermore, *aggression* scores were significantly lower at the first time point compared to the third time point (T1-T3: dif = –4.69, LL = –9.35; UL = –0.03) and the mean score at the second time point was lower than mean at the third time point (T2-T3: dif= –13.69, LL= –13.69; UL= –1.31).

DISCUSSION

The major accomplishments of this study include: 1) demonstration of the role of sexual dimorphism in motivation of judo athletes, with men needing more experiencing *stress* and relieving *aggression* in the form of routine forms of fighting; 2) Finding significant intergroup differences in both women and men in the level of motivation factors which consisted in increasing, at the third time point, of the values of motivation factors: *excellence*, *power*, *extrinsic success* and *aggression*. Furthermore, only in the women's group, the level of *stress* was increased significantly, whereas in the men's group the significant increase was observed for independence. About comparison for the same time points, the only significant difference between genders was lower value of *stress* in the first measurement (T1) in women compared to men (diff = –5.67, LL= –10.67; UL = –0.67).

A fight of judoists can be approached as a simulated method to solve a conflict, with renewed attack and efficient defence used to prevent the opponent from the achievement of his or her sports goal and to be successful at his or her cost. This type of hurting the other person, however, has a special context, since the loser has a chance to continue practising judo, improve fighting methods and, eventually, win in another tournament. A ritual fighting system has emerged from the primarily aggressive means of self-determination in a serious fight to the death (ju-jitsu), is in contradiction to any use of force towards the environment [48].

After analysis of the results of the third series of the examinations (T3) of our study, several associations were found with the increasingly popular self-determination theory (SDT) [40]. The Terry and Fowles' questionnaire does not identify amotivation factor which is lack of intentionality, and personal causation. Injury risk is always involved in practising judo [49-51], which, similar to the disapproval of journalists or negative comments of TV speakers, may increase amotivation and impact on the level of need of competence.

In the opposite anchor to amotivation is located an SDT intrinsic motivation which indicates sports

Table 2. Motives of women and men in different time points (Mean and SD).

Variable (motives)	Women			Men		
	T1 (n = 25)	T2 (n = 11)	T3 (n = 13)	T1(n = 25)	T2 (n = 9)	T3 (n = 19)
Exc*	22.1 ±4.00	22.8±2.56	26.1 ±3.07	24.5 ±3.56	21.2 ±3.73	25.8 ±3.21
H&F	23.5 ±6.01	21.7±3.59	24.6 ±4.09	23.4 ±4.76	25.6 ±2.24	25.3 ±3.93
Aff	21.3 ±5.65	20.9±4.15	24.5 ±3.71	21.2 ±5.18	21.6 ±2.96	22.6 ±5.38
Ind*	22.7 ±5.52	23.6 ±2.73	25.6 ±3.48	21.3 ±4.77	22.3 ±3.46	26.2 ±3.07
Str*	14.1 ±8.33	18.4 ±5.48	22.1 ±4.25	19.7 ±5.25	21.0 ±3.87	23.4 ±4.42
Pow*	15.9 ±5.79	17.2 ±4.92	21.6 ±6.54	15.0 ±2.91	15.7 ±4.03	22.5 ±5.00
ExS*	21.0 ±3.40	20.6 ±4.82	25.6 ±2.29	20.1 ±5.11	21.6 ±4.61	24.2 ±3.80
InS	15.9 ±7.02	19.9 ±5.56	17.8 ±4.72	15.3 ±3.89	18.1 ±4.57	19.1 ±4.71
Agg*	12.7±6.69	14.2 ±3.71	21.9 ±5.06	16.8 ±3.01	14.0 ±6.22	21.5 ±4.90

*significant difference

activity as an incentive for enjoyment, pleasure and fun; no discernible reinforcement reward. This motivation is an indicator of highest autonomy need and is very clearly identified by Terry and Fowles questionnaire, as is an *intrinsic success*. Moreover, SDT intrinsic motivation was found to be associated with *independence*, *excellence*, *stress* and *power* in the national judo team members survey. In this study, intrinsic success had lower scores than extrinsic success indicated low autonomy need because it is associated with external regulation defined as 'for external reinforcement such as gaining rewards or avoiding a punishment on SDT scheme'. Judo rules promote activity in the attack while non-combativity (when an athlete does not attack enough) results in penalties. Therefore, technical and tactical actions and penalties are important for final judo bout outcome [52, 53]. This way of thinking is likely to reinforce a fear to start risky actions, and effective activity in attack can be decreased. For this reason, penalties are less frequently observed in women than in men during judo bouts [31]. Furthermore, external regulation can be associated with aggression which has recently increased in female judokas (T3-T1). Women develop traits that reflect social and communal roles, such as being expressive, caring, and interested in others. In contrast, men develop attributes that conform to expectations of social roles, such as protector and thrive for independence and competence [54]. It is interesting that the inclusion of the gender factor revealed a medium effect only for the social dimension of wellness (it was greater in the women group compared to the men group). It was also demonstrated that judo training contributes to the intensification of a sense of wellness in the general wellness and physical dimension, but not psychological and social dimensions, and the spiritual dimension [55]. It is justified to analyse correlations between physical activities, physical fitness, health, wellness and heredity, other lifestyles, environmental, and personal attributes [56]. The problems that are going to become more and more important from the cognitive and application standpoints include coach-athlete relations [57] and genotyping [58]. The explorations concerning attention and judo-specific effort during the important tournaments [59] in a broader context of profiles of gender schemes of self-concept and subjective social status of judo athletes [60] continue to be topical.

Introjected regulation defined as 'for avoiding external sources of disapproval, or gaining externally referenced approval' is directed to high internalisation. Introjected regulation can be associated with identified regulation (for personally hold values) and can be in next step associated with the highest of SDT *continuum*, i.e. integrated regulation. This dimension is characterized by behaviours which are fully incorporated into the repertoire of behaviours that satisfy psychological needs. Therefore, we suppose that *health and fitness*, *independence* and *excellence* are likely to be closely related to *extrinsic* highest motives. Consequently, the highest desirable integrated degree of internalisation can be defined by both integrated regulation and intrinsic motivation scores. Keeping in mind the social theory of [54], we would like to hypothesise for our next survey that *affiliation* can be the motive which will be an interaction with gender and competitive level of judokas.

Polish Adaptation of Sports Motivation Scale (SMS-6) based on self-determination theory

enables examination of motivation structure across sports contexts in Poland [61].

The strength of this study is its uniqueness in the area of identifying the motivations of elite judokas since it concerns the period of 25 years and presents the results against the background of dynamic socio-economic changes in Poland. On the other hand, we realize that the weakness of the study is that changes in coaches of men's and women's national teams, training focus caused by changes in judo rules and training tendencies observed during preparation for tournaments were not considered, especially individual effects of interventions of psychological consultants, which could have partially affected the results of searching for intergroup differences.

CONCLUSIONS

1. In general, we observed sexual dimorphism in judo athletes with regards to the factors of *stress* and *aggression*. The dynamics of temporal changes in motivation among women and men were similar. It consisted of a significant increase in the importance of the factors of *excellence*, *power*, *extrinsic success* and *aggression* (T3-T1).

2. In the period of a 10-year membership in the European Union (T3), the level of the stress factor (in women) and independence (in men) significantly increased compared to the first examinations before the transition period (T1).

3. In the next study of motivation in judokas, both „Why do you participate in judo?" and SDT motivation tests should be complementarily used for the improvement in the psychological preparation of judo athletes of different genders and competitive levels.

4. With the individual determination of the needs and motives, we propose to take into consideration the status of their satisfaction during professional activity of athletes to improve the sense of wellness. This might help them improve their functioning in both sports settings and other spheres of life.

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