"IDO MOVEMENT FOR CULTURE. Journal of Martial Arts Anthropology",
Vol. 18, no. 3 (2018), pp. 1–6
DOI: 10.14589/ido.18.3.1

PSYCHOLOGY & SOCIOLOGY

Jindrisika Kohoutkova[1(ACDEF)], Pavol Masaryk[1(BEF)], Zdenko Reguli[1(DEG)]
1 Faculty of Sport Studies, Masaryk University, Brno (Czech Republic)
Contact e-mail: 102490@mail.muni.cz

The Experience of the State of Flow in Brazilian Jiu-Jitsu

Submission: 28.08.2017; acceptance: 22.03.2018

Key words: martial arts, sport psychology, optimal experience, parts of training

Abstract

Background and Aim. Flow experience is known as highly rewarding and pleasurable experience. It happens due to deep focus on an activity one is just performing. The person becomes one with the activity losing consciousness about time and is detached from the ego. The research purpose is to examine and compare flow in three different parts of Brazilian Jiu Jitsu training.

Methods. The research included 136 respondents. For collecting data we used DFS-2 questionnaire (short version). It consists of nine questions corresponding to Csikszentmihalyi´s concept of nine dimensions. Data collection was done via on-line link and distributed through email and social network.

Results. The results showed that there were significant differences between the parts of training in each dimension. In two dimensions (Merging of action and awareness and Loss of self-consciousness) the significant difference was found in all three parts of the training. In two dimensions (Challenge skill balance and Clear goals) the difference was found only in one case of three parts of the training when they have been compared to each other.

Conclusion. Flow experience is definitely an area of study worth to pay attention to as the understanding the principles of it can bring better approach towards better quality of a training in any area of physical activity and beyond. For further and more complete data would be necessary to use a qualitative approach too.

Introduction

Although sport psychology is considered as a young discipline, it is a field of study that can significantly affect an athlete´s performance [Kriventsova *et al.* 2017; Greenspan, Feltz 1989; Weinberg, Comar 1994]. There have been several studies done in an area of sport psychology in martial arts [Cihounkova, Vit 2014; Fuller 1988; Weinberg, Seabourne, Jackson 1981]. The reason is that practicing martial arts leads to natural cultivation of mental and physical health [Iedwab, Standefer 2000; Lim, O'Sullivan 2016; Cynarski *et al.* 2017]. Dosil [2006] discusses application of sport psychology in the context of optimal performance in martial arts.

The purpose of this study is to examine psychological phenomenon called flow which can positively affect the quality of athlete´s performance [Stavrou *et al.* 2007]. The state of flow, or so-called optimal experience known as the zone [Ford 2013]. It is a state of mind described in positive psychology [Peterson 2006], defined by professor Mihaly Csikszentmihalyi [1990, 1993, 1997]. A person experiencing the flow state is immersed in absolute focus on an activity which is just performing, detached from ego and oneself [Csikszentmihalyi 1990]. Schaffer [2013] describes flow as a state when one is so occupied by an activity that has no worries or anxiety about future or has no time to think about what others think about him. The person is focused on an actual moment rather than actual needs or advantages which are brought by the activity. The flow state, is often in Cszikszentmihalyi´s work connected with an intrinsic motivation [Csikszentmihalyi 1990]. Therefore this experience can bring feelings of happiness, pleasure and satisfaction.

Research on flow state in martial art is scarce. Reguli, Cihounkova and Sebera [2014] found that there is no significant difference in experiencing flow between different levels of athletes in non-competitive martial art such as aikido. Thus, the research was done on examination of flow experience during practice of Brazilian Jiu-Jitsu (BJJ) which is a martial art and a competitive combat sport. It has an origin in Japanese self-defense system ju-jutsu and its roots are connected with warfare art of samurai. Basic principle has the origin in a theory that with the right technical skill, a smaller and

weaker opponent can defeat the bigger and stronger one [Frederic 2006]. However, today's martial arts are perceived as non-violent and developmental physical activities [Hortiguela *et al*. 2017].

The main objective of this work was to find out if there is any significant difference in experiencing the state of flow between three parts of training: 1) learning new techniques, 2) drill exercises and 3) rolling (sparring), among practitioners of BJJ. Each of these parts has a potential to induce the state of flow in different ways and by different aspects. Each dimension of Csikszentmihalyis nine-dimensional model (described in section material and methods) can be dominant in other way in different parts of training [Jackson, Csikszentmihalyi 1999]. It is not even necessary for all of them to appear and state of flow can be experienced. Understanding the flow experience and its occurrence or non – occurrence during the practice could be helpful for developing guidelines which could be implemented to other sports.

Material and methods

Research Tool

There are two standardized questionnaires widely used in order to asses the flow experience in physical activity: Flow State Scale – 2 (FSS-2) and Dispositional Flow Scale – 2 (DFS-2). The questionnaires were developed and validated by Jackson and Eklund [2002] and are based on Csikszentmihalyi´s nine-dimensional model (see Table 1).

Table 1. 9 – Dimensional Model

Dimension	Statement
1. Challenge-skill balance	I feel I am competent enough to meet high demands of the situation.
2. Merging of action and awareness	I do things spontaneously and automatically without having to think.
3. Clear goals	I have a strong sense of what I want to do.
4. Immediate and unambiguous feedback	I have a good idea while I am performing about how well I am doing.
5. Concentration on the task at hand	I am completely focused on the task at hand.
6. Paradox of control	I have a feeling of total control over what I am doing.
7. Loss of self-consciousness	I am so focused on activity that I am not aware of myself.
8. Transformation of time	The way time passes seems to be different from normal.
9. Autotelic experience	The experience is extremely rewarding.

There are long and short versions of these questionnaires. Jackson, Martin and Eklund [2008] constructed and verified validity of long and short versions of FSS-2 and DFS-2. Coefficient alfa estimates of reliability from item-identification for DFS-2 was .81 and from cross-validation was .74.

The short model validity was proved by examination of two short flow models. The first one was set independently. That means nine questions were not a part of 36-item form. The second one assessed nine items which were part of 36-item form. As Jackson, Martin and Eklund [2008] described: "The nine items selected for the short flow scales were assessed as suitable for providing shot measure of flow".

A questionnaire DFS-2, short version (original) was used for examining the flow experience in BJJ. DFS-2 participants were asked to answer from the view of general experience with the activity.

In the short version, one question is devoted to each of nine dimensions. Therefore, the short version consists of nine questions. The complete form for our research consisted of 27 questions as there were 3 three different parts of the training compared (learning new technique, drill exercises and rolling).

These are the statements which were used to asses flow experience for each of the three parts of the training listed above. The statements are sorted by appropriate dimension.

There was a 5-point Likert Scale used to assess the level of agreement with each statement. Number 1 means strong disagreement with the statement and number 5 means strong agreement with the statement [DeVellis 2011; Leung 2011].

Description of training parts assessed

The first part of the training **learning new technique** is usually practiced in a pair and the main goal is to feel the movement and to learn the most efficient way of doing it. Additional goals were to learn how to connect separated muscle groups and to understand the principles and mechanism of the technique. The role of partner is to receive the technique (the role of *uke*), so the resistance of the partner is not required [Gracie, Gracie 2001]. In the second part, **repeated (drill) exercises** are based on repeating already known movements faster. The goal is to automatize and fix the movement to increase its performance to a higher level, without thinking about single steps the movement is composed of. Reaction time is shortened in fight. If movement is done correctly, technical sophistication, development of movement and performance of particular technique are ascending. Training partner is cooperating, as it is required during learning technique [Galvao, Howell 2010]. The third part: **rolling**, or sparring, is a real simulation of fight or match according to the safety rules. Both partners are trying to eliminate the opponent and to make him submit, with using all permitted technical ways.

Participants

The questionnaire was completed online by 141 respondents. There were 136 respondents chosen for the research who met all the requirements. Five questionnaires were

excluded because they did not meet all the requirements. The participants filled out demographic information asking about their age, duration of experience in BJJ training and achieved technical level.

BJJ ranking system

BJJ practitioners have different technical level marked by color of the belt – *obi*. Graduation in BJJ is slightly different in comparison with other martial arts disciplines, for example judo or karate. In BJJ, graduation is the matter of individual judgment of instructors or masters in a particular academy. There is no exam or performance of techniques. The trainer gives another belt level to his trainee when he is worth of particular level. Due to this system, there are big differences in the level of skills between academies and clubs, because standards and requirements from trainers are different [Gurgel 2017].

Data collection

The questionnaire was distributed via internet in an electronic form. The link was published on Facebook groups and communities whose members are practitioners of BJJ. The participation in the research was voluntary. The credibility of the participants was ensured by their free will to participate.

Results

All data were analyzed by software Statistica.

Demographic information

The sample was wide in the age, from 16 to 56 years old and also in experience from 0,1 to 20 years of training. Also there was a wide range of participants‘ technical

Table 2. Demographic Information – Participants

	Average	Minimum		Maximum	Standard deviation
Age	28.5	16		56	7.47
Height	177.91	152		194	7.73
Weight	78.03	46		115	12.27
Years of training	4.1	0.1		20	3.25
Belt color	**White**	**Blue**	**Purple**	**Brown**	**Black**
Number of holders	37	58	23	11	7

Table 3. Descriptive Analysis

	Median	Lower Quartile	Upper Quartile	Standard Deviation
Challenge-skill balance [During drill exercise]	4.00	4.00	5.00	0.77
Challenge-skill balance [During learning new technique]	4.00	4.00	4.50	0.79
Challenge-skill balance [During rolling]	4.00	3.00	4.50	0.89
Merging of action and awareness [During drill exercise]	4.00	3.00	4.00	1.05
Merging of action and awareness [During learning new technique]	3.00	2.00	4.00	1.11
Merging of action and awareness [During rolling]	4.00	3.00	5.00	1.00
Clear goals [During drill exercise]	4.00	4.00	5.00	0.75
Clear goals [During learning new technique]	4.00	3.00	4.00	0.90
Clear goals [During rolling]	4.00	3.00	5.00	0.82
Immediate and unambiguous feedback [During drill exercise]	4.00	4.00	5.00	0.74
Immediate and unambiguous feedback [During learning new technique]	4.00	3.00	4.00	0.91
Immediate and unambiguous feedback [During rolling]	4.00	4.00	5.00	0.80
Concentration on the task at hand [During drill exercise]	4.00	3.00	5.00	0.83
Concentration on the task at hand [During learning new technique]	4.00	4.00	5.00	0.79
Concentration on the task at hand [During rolling]	4.00	4.00	5.00	0.78
Paradox of control [During drill exercise]	4.00	3.00	4.00	0.81
Paradox of control [During learning new technique]	3.00	3.00	4.00	0.90
Paradox of control [During rolling]	4.00	3.00	4.00	0.95
Loss of self-consciousness [During drill exercise]	3.00	2.00	4.00	1.10
Loss of self-consciousness [During learning new technique]	3.00	2.00	4.00	1.10
Loss of self-consciousness [During rolling]	3.00	2.00	4.00	1.21
Transformation of time [During drill exercise]	4.00	3.00	4.00	1.10
Transformation of time [During learning new technique]	4.00	3.00	4.00	1.12
Transformation of time [During rolling]	5.00	4.00	5.00	0.88
Autotelic experience [During drill exercise]	5.00	4.00	5.00	0.88
Autotelic experience [During learning new technique]	5.00	4.00	5.00	0.81
Autotelic experience [During rolling]	5.00	5.00	5.00	0.45

degrees with 37 white belts, 58 blue belts, 23 purple belts, 11 brown belts and 7 black belts. The demographic information of the participants are described in Table 2.

Although there were data collected asking about the age and technical level of the participants of BJJ which could also play an important factor in experiencing flow [Jackson 1998; Koehn, Morris 2014], the demographic information serve descriptional purpose only. In this study the main focus was placed on comparison of flow experience between the three different parts of the training. The age and the years of experience were averaged and it was worked with the same sample of participants in all the groups compared.

Descriptive analysis

Table 3 shows a descriptive analysis of data for each dimension and part of the training.

Friedman ANOVA

Non-parametric comparison by Friedman ANOVA of three variables was done to compare if there is any significant difference in particular dimension between each part of training. As given in Table 4, results differ from one dimension to another. However, all dimensions showed significant differences at the $p < 0.05$.

Table 4. Friedman ANOVA

Dimensions	p-value
Challenge-skill balance	0.00462
Merging of action and awareness	0.00000
Clear goals	0.00296
Immediate and unambiguous feedback	0.00002
Concentration on the task at hand	0.00025
Paradox of control	0.00000
Loss of self-consciousness	0.00000
Transformation of time	0.00000
Autotelic experience	0.00000

Wilcoxon matched pair test

Wilcoxon match pair test was done to find where particular differences in each dimensions have occurred. Here is the list of parts of training and dimensions where significant differences were found.

Drill exercises and learning new technique

There was a significant difference between flow experience in drill exercises and flow experience in learning new technique in the following 6 dimensions: **Merging of action and awareness** (p=0.000000), **Clear goals** (p=0.000160), **Immediate and unambiguous feedback** (p=0.000055), **Concentration on the task at hand** (p=0.008129), **Paradox of control** (p=0.000000) and **Loss of self-consciousness** (p=0.009867).

Learning new technique and rolling

There was a significant difference between flow experience in learning new technique and flow experience in rolling in the following 5 dimensions: Merging of action and awareness (p = 0.000000), Immediate and unambiguous feedback (p=0.013459), Loss of self-consciousness (p=0.000000), Transformation of time (p=0.000000), Autotelic experience (p=0.000000).

Rolling and drill exercises

However, even **seven dimensions** showed the significant differences between flow experience in rolling and flow experience in drill exercises: **Challenge-skill balance** (p=0.004678), **Merging of action and awareness** (p=0.004634), **Concentration on the task at hand** (p=0.000203), **Paradox of control** (p=0.000215), **Loss of self-consciousness** (p=0.000042), **Transformation of time** (p=0.000000), **Autotelic experience** (p=0.000000).

Discussion

Although many athletes intend to achieve flow state purposefully in order to enhance their performance, it has been discussed that flow state of mind is rather rare and elusive in sport [Aherne, Moran, Lonsdale 2011]. Swann *et al*. [2017] try to understand conditions under which can optimal states such as flow and other similar states occur.

There is some criticism about flow state described as the state, when high skills meet high challenge and experience [Moneta 2012]. From data collected, we can see that the state of flow has a different potential to be experienced during the training of BJJ dependent on the part of training. Drill exercises, learning new technique and rolling are activities that can be experienced within one training session, but the mental and spiritual outcome and effect can be differed. There could be a difference in experiencing flow state between practice and competition according to the mood of an athlete. In judo, the important role that mood state plays on flow in competition was showed [Montero-Carretoro *et al*. 2015].

Although for more accurate value and validity for these conclusions, there would have to be a bigger sample of respondents and a deeper inquiry. This research with its results can show some ideas of mental processes and spiritual potential during training of BJJ.

Conclusion

The research showed that in BJJ there are some significant differences between the three parts of training in each dimension. Furthermore in two dimensions (Merging of action and awareness and Loss of self-consciousness) the significant difference was found in all three parts of the training. In two dimensions (Challenge skill balance and Clear goals) the difference was found only in one case of three parts when it was compared at each other.

These results would be more valuable if the sample of respondents was bigger. Also if the qualitative methods such as interview would be used, there would be a possibility for measuring also intensity of flow individually.

Although there have been a few studies done on flow experience in martial arts, we cannot compare the results to any other research at this moment, due to the fact, that each research pursues different goals. We mainly focused on the comparison of the flow experience in different parts of training in specific martial art. This kind of research has not been done so far.

Flow experience is definitely an area of study worth paying attention to as the understanding the principles of it can bring better approach towards better quality of a training in any area of physical activity and beyond. This research and its results can show some ideas of mental processes and experience the practitioners of BJJ are going through during training session. Also these findings can be used by trainers and coaches in assessment of teaching style and for meeting their goals with their trainees.

References

1. Aherne C., Moran A.P., Lonsdale C. (2011), *The effect of mindfulness training on athletes' flow: An initial investigation*, "Sport Psychologist", vol. 25, no. 2, 177–189.
2. Cihounkova J., Vit M. (2014), *Karatekas of Various Styles Placing Associational Words Connected with Training of Martial Art* [in:] D. Milanović; G. Sporis [eds.], *7th International Scientific Conference on Kinesiology (2014), Opatija, Croatia*, University of Zagreb, Faculty of Kinesiology, Opatija, Croatia, pp. 503-506,
3. Csikszentmihalyi M. (1990), *Flow. The Psychology of Optimal Experience*, Harper &Row, New York.
4. Csikszentmihalyi M. (1993), *The Evolving Self*, Harper and Row, New York.
5. Csikszentmihalyi M. (1997), *Finding Flow, the Psychology of Engagement with Everyday Life*, Basic Books, New York.
6. Cynarski W., Pawelec P., Zeng H., Jong-Hoon Yu, Vit M., Bielec G., Slopecki J., Kubala K., Blazejewski W. (2017), *Social Determinants of Attitudes towards Health in Martial Arts: comparison between combat sports and combat systems and martial arts practitioners*, "Ido Movement for Culture. Journal of Martial Arts Anthropology", vol. 17, n. 1, pp. 23-29; doi: 10.14589/ido.17.1.4.
7. DeVellis R.F. (2011), *Scale Development: Theory and Applications (Applied Social Research Methods)*, SAGE Publications, Inc; 3 edition.
8. Dosil J. (2006), *The Sport Psychologist´s Handbook: A Guide for Sport – Specific Performance Enhancement*, John Wiley and Sons Ltd., England.
9. Ford S. (2013), *Welcome to the Zone: Peak Performance Redefined*, Outskirts Press Inc., Colorado.
10. Frederic L.A. (2006), *Dictionary of the Martial Arts*, Dover Publications Inc.
11. Fuller J.R. (1988), *Martial Arts and Psychological Health*, "The British Psychological Society", vol. 61, no. 4, pp. 317-328.
12. Galvao A., Howell K. (2010), *Drill to Win: 12 Months to Better Brazillian Jiu-Jitsu*, Victory Belt Publishing.
13. Gracie R., Gracie R. (2001), *Brazilian Jiu-Jitsu Theory and Technique*, Invisible Cities Press Llc.
14. Greenspan M.J., Feltz D.L. (1989), *Psychological Interventions with Athletes in Competitive Situations*: *A Review*, "The Sport Psychologist", vol. 3, no. 3, pp. 219-236.
15. Gurgel F. (2017), *Brazilian Jiu-Jitsu Basic Techniques*, Blue Snake Books, Berkeley.
16. Hortiguela D., Gutierrez-Garcia C., Hernando-Garijo A. (2017), *Combat versus Team Sports: the Effect of Gender in a Climate of Peer Motivation, and Level of Fun and Violence in Physical Education Students*, "Ido Movement for Culture. Journal of Martial Arts Anthropology", vol. 17, no. 3, pp. 11–20; doi: 10.14589/ido.17.3.2.
17. Iedwab C.A., Standefer R.L. (2000), *Martial Arts: Mind & Body*, Human Kinetics.
18. Jackson S.A., Ford S.K, Kimiecik J.C., Marsh H.W. (1998), *Psychological Correlates of Flow in Sport*, "Journal of Sport and Exercise Psychology", vol. 20, no. 4, pp. 358-378.
19. Jackson S.A., Csikszentmihalyi M. (1999), *Flow in Sport, the Keys to Optimal Experience*, Human Kinetics, Champaign.
20. Jackson S.A., Eklund R.C. (2002), *Assessing Flow in Physical Activity: The flow State Scale-2 and Dispositional Fow Scale-2*, "Journal of Sport & Exercise", vol. 24, no. 2, pp. 133-150.
21. Jackson S.A., Martin A.J., Eklund R.C. (2008), *Long and Short Measures of Flow: The Construct Validity of the FSS-2, DFS2 and New Brief Counterparts*, "Journal of Sport & Exercise Psychology", vol. 30, no. 5, pp. 561-87.
22. Koehn S., Morris T. (2014), *The Effect of Performance Context and Skill Level on the Frequency of Flow Experiences*, "European Journal of Sport Science", no. 14, suppl. 1.
23. Kriventsova I., Iermakov S., Bartik P., Nosko M., Cynarski W.J. (2017), *Optimalization of student-fencers' tactical training*, "Ido Movement for Culture. Journal of Martial Arts Anthropology", vol. 17, no. 3, pp. 21–30; doi: 10.14589/ido.17.3.3.
24. Leung S.A. (2011) *Comparison of Psychometric Properties and Normality in 4-, 5-, 6-, and 11-Point Likert Scales*,"Journal of Social Science Research", vol. 37, no. 4, pp. 412-421.
25. Lim T., O'Sullivan D.M. (2016) *Case Study of Mental Skills Training for a Taekwondo Olympian*, "Journal of Human Kinetics", vol. 50, no. 1, pp. 235-245.
26. Moneta G.B. (2012) *On the Measurement and Conceptualization of Flow* [in:] S. Engeser [ed.], *Advances in Flow Research*, Springer, New York, pp. 23-50.
27. Montero-Carretoro C., Gonzalez-Cutre D., Moreno-Murcia J.A., Carratala V., Cervello E.M. (2015), *Motivation, Mood State, and Flow in Elite Judokas*, "Revista Mexicana de Psicologia", vol. 32, no. 2, pp. 101-112 [in Spanish].
28. Peterson Ch. (2006), *A Primer in Positive Psychology*, Oxford University Press.
29. Reguli Z., Cihounkova J., Sebera M. (2014), *Flow State of Different Levels in Aikido Practitioners* [in:] D. Milanovic,

G. Sporis [eds.], *7th International Scientific Conference on Kinesiology: Fundamental and Applied Kinesiology - Steps Forward*, pp. 544-546.

30. Schaffer O. (2013), *Crafting Fun User Experiences: A Method to Facilitate Flow*, Human Factors International.
31. Stavrou N.A., Jackson S.A., Zervas Y., Karteroliotis K. (2007), *Flow Experience and Athletes´ Performance with Reference to the Orthogonal Model of Flow*, "The Sport Psychologist", vol. 21, no. 4, 438-457.
32. Swann Ch., Crust L., Jackman P., Vella S.A., Allen M.S., Keegan R. (2017), *Psychological States Underlying Excellent Performance in Sport: Toward an Integrated Model of Flow and Clutch States*, "Journal of Applied Sport Psychology", vol. 29, no. 4, pp. 375-401.
33. Weinberg R.S., Comar W. (1994), *The Effectiveness of Psychological Interventions in Competitive Sport*, "Sports Medicine", vol. 18, no. 6, pp. 406-418.
34. Weinberg R.S., Seabourne T.G., Jackson A. (1981), *Effects of Visuo-motor Behaviour Rehearsal, Relaxation, and Imagery on Karate Performance*, "Journal of Sport Psychology", vol. 3, no. 3, pp. 228-238.

Doświadczenie stanu uniesienia (przepływu) w brazylijskim jiu-jitsu

Słowa kluczowe: sztuki walki, psychologia sportu, optymalne doświadczenie, części treningu

Abstrakt

Tło i cel. Doświadczenie związane ze stanem uniesienia (przepływem) znane jest, jako wysoce satysfakcjonujące i przyjemne doświadczenie. Dzieje się tak ze względu na głębokie skupienie się na właśnie wykonywanej czynności. Osoba staje się jednością z wykonywaną czynnością, tracąc świadomość czasu i odrywając się od *ego*. Celem badań było zbadanie i porównanie tego stanu podczas trzech różnych części treningu brazylijskiego jiu-jitsu.

Metody. Badaniami objęto 136 respondentów. Do zbierania danych wykorzystano kwestionariusz DFS-2 (wersja skrócona), składający się z dziewięciu pytań odpowiadających koncepcji dziewięciu wymiarów stworzonych przez węgierskiego psychologa Mihalya Csikszentmihalyi. Zbieranie danych odbywało się za pomocą internetu i rozpowszechniane było za pośrednictwem poczty elektronicznej i sieci społecznościowej.

Wyniki. Wyniki pokazały, że istnieją znaczne różnice między częściami szkolenia w każdym wymiarze. W dwóch wymiarach (Połączenie działania i świadomości oraz Utrata samoświadomości) stwierdzono istotną różnicę we wszystkich trzech częściach treningu. W dwóch wymiarach (Wyzwanie dotyczące równowagi umiejętności i Jasne cele) różnica została stwierdzona tylko w jednym przypadku z trzech części treningu, gdy zostały one porównane ze sobą.

Wnioski. Doświadczenie uniesienia (przepływu) jest zdecydowanie obszarem nauki, na który warto zwrócić uwagę, ponieważ zrozumienie jego zasad może zapewnić lepsze podejście do jakości szkolenia w dowolnej dziedzinie aktywności fizycznej i poza nią. Aby uzyskać bardziej kompletne dane, konieczne byłoby również zastosowanie podejścia jakościowego.