Psychometric properties of a newly established flow state questionnaire

Yeni Akış Durum Ölçeği'nin psikometrik özellikleri

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Abstract

In the last decades several measuring methods have been established for studying flow experience. The starting point for the establishment of the Flow State Questionnaire (PPL-FSQ: Flow State Questionnaire of the Positive Psychology Lab) was Csíkszentmihályi's phenomenological definition. There is no consensus about the basic factors of flow experience, so the goal was to develop a questionnaire which is based on theoretical principles and empirical results also. The first version of the PPL-FSQ had 40 items. In order to test this questionnaire a study was conducted with 214 participants. Exploratory post hoc analysis and factor analysis were performed and had a result of a two-factor model of 16 items. The questionnaire was improved by item-imputation, so the second version of the survey consisted of 23 items. Then the instrument was tested through several studies (N = 260) and the latent structure of the questionnaire was examined. The exploratory factor analysis resulted in a two-factor model of 20 items. The balance between challenges and skills (11 items) and Absorption in the activity (9 items) factors. Identifying these two factors strengthens the theoretical hypothesis that the basic dimensions of flow experience are the balance between challenges and skills, as well as absorption in the task.

Keywords: Flow; questionnaire; factor analysis, validity, reliability

Özet

Son yıllarda, akış deneyimini değerlendirmek üzere farklı ölçme yöntemleri kullanılmıştır. Akış Durum Ölçeği (ADÖ) için çıkış noktası, Csíkszentmihályi'nin fenemenolojik tanımı olmuştur. Akış deneyiminin temel faktörlerinin ne olduğu ile ilgili bir uzlaşma söz konusu değildir, dolayısıyla bu çalışmada amaç kuramsal temellere dayalı ve deneysel bulgularla desteklenmiş bir ölçme aracı geliştirmektir. ADÖ'nün ilk versiyonu 40 maddeden oluşmuştur. Bu ölçek 214 katılımcıdan elde edilen veriler üzerinden test edilmiştir. Açımlayıcı post-hoc analizi ve açımlayıcı faktör analizi sonucu iki faktörlü 16 maddelik bir ölçek elde edilmiştir. Daha sonra yapılan çalışmada, ölçek maddeleri artırılmış ölçeğin ikinci versiyonu 23 maddeden oluşmuştur. Ölçek birkaç çalışmada test edilmiş (N = 260) ve ölçeğin faktör yapısı incelenmiştir. Açımlayıcı faktör analizi sonucu, iki faktörlü 20 maddelik bir ölçek elde edilmiştir. Buna gore ölçeği oluşturan faktörler, güçlükler ve beceriler arasındaki denge (11 madde) ve işe yoğunlaşma olarak belirlenmiştir. Sözkonusu bu iki faktör, akışla ilgili tanımlanan teorik hipotezi destekler niteliktedir.

Anahtar Kelimeler: Akış, ölçek, faktör analizi, geçerlik, güvenirlik

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Introduction

Csíkszentmihályi has framed his flow theory based on his systematic research that took two decades (Csíkszentmihályi, 1975/2000). He focused on the circumstances of the happiest and most pleasured moments of people's life. Flow is a subjective state, where the person is intensively involved in a task, excluding other stimuli and attention is fully invested in that exact challenging but achievable activity (Csíkszentmihályi, Abuhamdeh & Nakamura, 2005). In the last decades a lot of methods have been established for measuring flow (both qualitative and quantitative ones).

The measurement of flow has a significant past, as several measuring tools have been developed since the construct was established. Due to this long past of flow measurement (Engeser, 2012) it might be reasonable to draw a review of the methods with the description of their use, advantages and disadvantages, then try to build an integrated process of the development of a new measure which may integrate the previous findings on the area of measuring flow. This work can help capturing flow through its inevitable dimensions which may contribute to the better understanding of this construct, and might empirically check the antecedents and the special characteristics also of this phenomenologically constructed subjective state.

The conceptual basis of flow, its nature and conditions were discovered by Csíkszentmihályi with half-structured interviews of e. g. chess players, climbers, dancers, or surgeons (Nakamura & Csíkszentmihályi, 2005), and the general characteristics of flow experience (the balance between challenges and skills, clear goals, immediate feedback) and its proximal conditions were also determined.

Since then, interview methods have been used in several research to comprehensively understand the nature of flow experience (i. e. Hefferon & Ollis, 2006; Swann, Keegan et al., 2011). Occasionally the interview was combined with observation techniques (i. e. Seifert & Hedderson, 2010) which are mainly used in exploratory research where the aim is to observe situations or activities (Delle Fave, Massimini & Massi, 2011). One of the significant advantages (Csíkszentmihályi & Robinson, 1990) of the interview method is its adequacy for revealing situation-specific factors or cultural characteristics of flow (Delle Fave, Massimini & Bassi, 2011; Swann, Keegan et al., 2011). It is a flexible and dynamic research method (Pace, 2004), although not an accurate technique because of distortion. The research of small samples is feasible, but it is an important method also for examining comprehensive, subjective aspects which can be a starting point in the development of quantitative methods and questionnaires (i. e. Jennett, Cox et al., 2008).

The Experience Sampling Method (ESM[3]) was established for describing everyday life. It examines what people do, how they feel during the activity, so the flow examination is 'online' in real time and context (Csíkszentmihályi, Larson & Prescott, 1977). In its first version the subjects were asked to write their activities on that particular day and which moments were the most enjoyable. However this technique was impractical as there were only a few discriminative answers. Csíkszentmihályi and his colleagues (1977) were the first who tried the pager method and its attached two-page questionnaire. During this procedure electronic signs activate the pager at random times. The subjects state their answers then on a self-report form about the actual activity, their partners, and actual mood. Besides these data, participants report their perceived experiences on different Likert-scale questionnaires (Csíkszentmihályi & Larson, 2006), depending on the focus of the research.

The ESM allows measuring the effect of the context; personal characteristics can also be tested with this method (i. e. flow, positive affects, concentration). Important patterns can also be revealed by this method: for example the dynamics of emotions or subjective states (intensity,

[3] ESM: Experience Sampling Method

sequences of states, and the relationship between different states) (Csíkszentmihályi & Larson, 2006). It is a colorful method of data collection for distinguishing between short- and long-term effects (Csíkszentmihályi & Hunter, 2003).

The main limitation of the ESM is its dependency of self-reports – there are situations which can be quite problematic (i. e. private, sensitive, illegal activities) (Csíkszentmihályi & Larson, 2006), or there are no answers or just selective answers. Another disadvantage is its costly execution. However the validation and reliability of the ESM are supported by many research results (i. e. Csíkszentmihályi & Larson, 2006).

The ESM has been used in a lot of recent research (i. e. Csíkszentmihályi & Hunter, 2003; Moneta, 2004). The method has been improved many times: the best innovation of the method is the feedback function for the subjects (ES+feedback, Hsieh, Li et al., 2008), the development of reconstruction possibilities for the experience sampling day (Khan, Markopoulos et al., 2008), and the introduction of different mobile and computer applications (Khan & Markopoulos, 2009; Chen, Wigand & Nilan, 1998).

Contrary to the interview or the ESM methods, paper-pencil tests are used when the purpose is not the identification of flow dimensions but their measurement, and the exploration of differences in the occurrence of flow experience, or between situations or persons (Nakamura & Csíkszentmihályi, 2005).

According to Novak and Hoffman's typology (1997), research which used narrative description/survey approach gives a general flow description (e. g. Jackson & Roberts, 1992) for subjects, then they make a short, narrative and specific description about the situation in which they had the exact experience, after which they evaluate the activity on a scale. This is the most general and least specific level of flow measurement. Delle Fave, Massimini and Bassi (2011) note that surveys with more items are more psychometrically reliable, but when choosing the measurement the researcher needs to focus on the aim of the study.

In the last decades several situation-specific procedures have been developed for measuring flow. The "activity/survey" approach (Novak & Hoffmann, 1997) can also be used in laboratory contexts; it is a proper tool for examining specific activities. It is important to decide when the participants should evaluate the level of their flow experience: during or after the activity. It is considered that questionnaires which are filled-in right after the activity have higher validity. The focus of the situation-specific flow questionnaires is mainly work, sports, leisure time activities and human-computer interactions, a wide-range of self-report instruments have been offered.

Table 1. *Situation-specific questionnaires of flow*

Author(s) (date)	Instrument	Number of items	Dimension(s)
Jackson and Marsh (1996)	Flow State Scale	36	Autotelic experience Clear goals Challenge-skill balance Concentration on task at hand Paradox of control Unambiguous feedback Action-awareness merging Transformation of
Jackson, Kimiecik et al. (1998)	Dispositional Flow Scale		

			time Loss of self-consciousness
	Flow State Scale-2		
Jackson and Eklund (2002)			
	Dispositional Flow Scale-2		
Jackson, Martin and Eklund (2008)	Short Flow Scales (dispositional and state)	9	Unidimensional flow construct
Martin and Jackson (2008)	Core Flow Scales (dispositional and state)	10	
Novak and Hoffmann (1997)	Flow questionnaire for internet users	77	Sum of skills and challenges Difference of skills and challenges Flow
Choi and Kim (2004)	Questionnaire for measuring the flow state (computer-situation)	18	Operator Feedback Communication place Communication tool Autotelic experience Time distortion
Kiili (2005)	Flow Scale-1	23	Playability Challenge Goals Feedback Story Concentration Control
Oláh (2005)	Situation-Specific Flow Questionnaire	26	Flow Anxiety Boredom Apathy Absorption during work
Bakker (2008)	WOrk-Related Flow Inventory	13	Enjoyment of work Intrinsic work motivation

These paper-pencil measures are able to examine big samples and the experience and personal flow skill can be evaluated by specific dimensions. Some of these questionnaires construe the original Csíkszentmihályi phenomenon in various ways (Novak, Hoffmann & Yung, 1998), they usually involve some other constructs as well in flow questionnaires (i. e. Bakker, 2008).

The measurement of the concept of flow has been changed over the decades and several measuring method has been established based on many different designs as the previous section described. The different aspects of measurement captured flow in different ways, although they are mostly followed the original phenomenological direction offered by Csíkszentmihályi (1975/2000). However through the time a lot of differently structured analyzing process and operationalization have been available. According to the recent studies there is a need to integrate the different approaches, to reveal a basic structure behind the construct of flow as a kind of

standardization (e. g. Moneta, 2012). The presented study aims to develop a measure which considers the previous findings of the operationalization and measurement of flow as an integrating goal, and aims to establish a tool with this exploratory function for being able to sort out the inherent and inevitable factors of flow through which the construct can be captured the.

The phenomenological character of flow theory and the instability of factor structures (Csíkszentmihályi, Abuhamdeh & Nakamura, 2005) induce us to further study flow dimensions or if it is empirically and statistically reasonable to revise the flow theory induced methods. For testing these questions the Flow State Questionnaire (PPL-FSQ[4]) was established which is stable, based on empirical studies and previous research of flow measurement. It is an appropriate tool for measuring the basic meta-dimensions of flow, and can be used in different test situations for the better understanding of the studied phenomena: that subjective state, where the person is intensively involved in a challenging task, excluding other stimuli and with fully-invested attention (Csíkszentmihályi, Abuhamdeh & Nakamura, 2005).

Calculation

The first step of developing the PPL-FSQ was the review of literature about measuring flow (Jackson & Roberts, 1992; Chen, 2006; Oláh, 2005; Ghani & Deshpande, 1994; Novak & Hoffmann, 1997; Webster, Trevino & Ryan, 1993) and then the items were composed based on these previous findings above.

The original item bank had items associating with the following flow dimensions:

1. unambiguous goals which are possible to reach, direct feedback about the headways in the process,
2. intensive and focused attention on the exact activity which is being done,
3. fusion of activity and sense (consciousness),
4. those perceived challenges which can just be performed by extant skills,
5. loss of self-consciousness,
6. feeling control over the activity,
7. transformation of time perception.

The establishment of the original item bank was done by five researchers of the Positive Psychology Laboratory at Eötvös Loránd University. Those statements were composed which represented the scales previously revealed in the literature. The next step of the development was the filtration of duplicated items, and so the first version of the PPL-FSQ was finished: it contained 40 items which could be evaluated on a 5-point Likert scale (1-Strongly disagree to 5-Strongly agree). For testing this version a study was designed (N = 214). According to the original theory (Csíkszentmihályi, 1975/2000), flow is a different territory of experiences than antiflow states so there is a need to find those measuring items which can discriminate these qualitatively different mental states. In alignment the analysis of the first database was based on this discriminating aim, as the first study proved data of the first version of the PPL-FSQ in three different situations: flow, anxiety and boredom states. This discriminating design is mainly followed nowadays in the physiological study of flow experience (e. g. Peifer, 2012).

With the scale-edition, the aim was to analyze the discrimination characteristic of the items between flow and antiflow situations; the first goal was not to search for and reveal a latent, well-implemented structure.

In the phase of item selection the first step was a post hoc analysis. The items which could discriminate between flow and antiflow situations were analyzed, and got a result of a scale

[4] PPL-FSQ: Flow State Questionnaire of the Positive Psychology Lab

version with 12 items. Exploratory factor analysis was made on the selected item collection for testing the detachment of scales and resulted in two factors. There were 4 items in the post-hoc analysis which discriminated each situation from the others, therefore from a theoretical approach and with an aim for future testing these items were added to the 12-itemed structure.

In the next step of the development 7 further items were added, so the result is a version of 23 items. These 7 items were based on the feedback of the participants in the first study with the tetris design, in which subjects were asked to say statements which describe their experiences during the activity in the study – as the study was based on the induction of flow and antiflow experiences the statements by the subjects were expected to describe these subjective states. The second version of the questionnaire was tested in two different studies (30 and 100 people, 2-2 occasions, $N = 260$), after which the structure was tested by exploratory factor analysis again. The final version consists of 20 items of 2 factors.

Method

Subjects

The development of the PPL-FSQ was executed through three different studies with various research questions, through different designs. In these three studies different measures were administered but PPL-FSQ was used in all these three studies. The first 40-itemed version of the PPL-FSQ was tested on a sample of 214 university students ($M_{Age} = 22.29$; $SD_{Age} = 3.11$; $N_{Women} = 139$, $N_{Men} = 75$) in a study which focused on the discriminative experience-induction regarding flow and antiflow states through the calibration of the individual appropriate speed of an online Tetris game.

The second 23-itemed version of the PPL-FSQ was used in two laboratory studies on an overall sample of 260 university students ($M_{Age} = 22.45$; $SD_{Age} = 3.80$; $N_{Women} = 84$, $N_{Men} = 166$, with 10 missing data in the male and female samples). These subjects filled in the same version of the PPL-FSQ, though they participated in different studies: in the first study the focus was on the appearance of flow during motor learning associated with the focus of attention, then in the second study the scope of the questions was about the subjective and common experiences during a challenging, cooperative activity. The research samples were recruited at university courses, participation was voluntary.

Procedure

In the testing phase of the PPL-FSQ with 40 items the subjects played an online tetris game where speed was varied. There were three cases: too fast, too slow or optimal speed for the subject (speed was set on individual basis, the induction of flow and antiflow experiences were executed by the fitting of the difficulty and personal skill level). Participants filled in the online PPL-FSQ after each game session.

The second version of the PPL-FSQ was tested in two studies of playing interactive computer games (Nintendo Wii Snowboard / Tennis). In the first study the role of flow experience in acquiring motor skills were observed during a snowboard game where the intrinsic or extrinsic attention focus (Wulf & Lewthwaite, 2010) was manipulated. After the game they filled in the PPL-FSQ ($N = 60$). In the second study the aim was to differentiate flow experience in individual and social contexts through double tennis games with the computer and a real partner. After the games they filled in the PPL-FSQ ($N = 200$). The studies were permitted by the Ethical Committee of the Institute of Psychology at Eötvös Loránd University.

Measures

Different measures were administered in the three studies as in this paper the focus is on the development and description of PPL-FSQ. In the first study the PPL-FSQ with 40 items was used, based on the original flow theory and literature. The reliability of this version was low ($Cr\alpha$ = .393), the development of the questionnaire was reasonable. In the second study the modified PPL-FSQ with 23 items was administered. The reliability of this version fulfilled the psychometric expectations ($Cr\alpha$ = .841).

Results

Study 1

The first version of PPL-FSQ with 40 items was applied in Study 1. During the item selection the items were examined by post hoc analysis (LSD) for testing which items are those that differentiate between flow and boredom, and flow and anxiety states. The result of the analysis is a 12-item structure: there were 8 items which differentiate between flow and boredom states, and 4 items which differentiate between flow and anxiety states in a statistically reliable way ($p < .001$).

In the next step, in order to check the structure, factor analysis (Maximum Likelihood, Varimax rotation) was executed: the aim with the orthogonal rotation was to provide the independence of scales, because in this case the purpose was to differentiate between flow and antiflow situations.

The KMO statistic (.865) and the significance level of the Bartlett test ($df = 66$, $p < .000$) was psychometrically acceptable, items intercorrelated enough, so this item bank with 12 statements was suitable for finding latent structure. The analysis of the eigenvalues referred to a two-factor solution, the two factors explained 59.23% of the total variance. Factor scores were acceptable in every item, the result was a factor with 8 items and another with 4 items (Flow-Boredom and Flow-Anxiety factors, which support the results of the earlier post hoc analysis).

Table 2. *Exploratory factor analysis of the selected PPL-FSQ (with 12 items)*

Items	Factor		Communalities
	1	2	h2
11. The activity totally engrossed my attention.	*.773*	.085	.604
23. It was boring for me.*	-*.772*	-.184	.630
8. I forgot about the progress of time all along.	*.743*	.253	.617
16. My attention was not engrossed at all by the task I had to do.*	-*.733*	-.200	.578
38. I found the task interesting.	*.708*	.308	.596
5. I forgot about the progress of time.	*.691*	.033	.479
21. I forgot about my close environment.	*.669*	-.023	.448
14. Time passed faster than I thought it did.	.606	*.072*	.372
1. My mind worked in total harmony with my body.	.133	*.762*	.598
9. I felt that what I had to do matched my skills well.	.376	*.650*	.565
24. I acted according to requirements regarding myself.	-.159	*.543*	.320
3. I knew what I wanted to achieve.	.237	*.492*	.298

Note: the factor loadings of each factor are with italic numbers (Factor1: Flow-Boredom factor; Factor2: Flow-Anxiety factor), * signs the reverse-scored items.

According to the analysis, the reliability of Flow-Anxiety factor is reasonable ($Cr\alpha_{F\text{-}A}$ = .718), but Flow-Boredom factor did not have an acceptable reliability ($Cr\alpha_{F\text{-}B}$ = .307). As this factor structure is not the final one, the exploratory factor analysis was executed just to support the scale development. The correlation of these two factors was moderate (r = .358, p < .01).

There were 4 statements in the item bank during post hoc analysis which differentiated flow from boredom and anxiety situations (p < .001) as well, so these items were added to the questionnaire during the progress of development. This version had 16 items and got augmented by 7 further statements, so the second version of the PPL-FSQ contained 23 items.

Study 2

In the second step of the questionnaire development an exploratory factor analysis (Maximum Likelihood) of the 23 items was executed to decide if the items are appropriate to use, and to reveal a possible latent structure. Promax rotation (K = 4) was applied, because the aim was to reveal the dimensional structure of flow, and it is methodologically reasonable that factors don't need to be orthogonal (Delle Fave, Massimini & Bassi, 2011). The KMO statistic (.901) and the significance level of the Bartlett test (df = 253; p < .000) was psychometrically acceptable, items intercorrelated enough, so this item bank with 23 statements was suitable for finding a latent structure.

Eigenvalues predicted a three factor solution, but the factor loadings were unacceptably low on the third factor, therefore the three-factor model was rejected. The two factors explained 53.64% of the total variance. Those 3 items were excluded which had a factor loading lower than .5, so the result was a stable, well-fitted two-factor model with 20 items.

The coherent items could have been interpreted well, the first factor was labeled as Balance between challenges and skill (11 items), and the second was labeled as Absorption in the task (9 items).

Table 3. *Final factor structure of the PPL-FSQ and communalities*

Items	Factors		Communalities
	1	2	h2
23. I was able to keep up with the challenges.	*.825*	-.116	.651
9. I felt I can meet the requirements of the situation.	*.821*	-.046	.658
17. I had a grip on the events.	*.796*	.016	.640
14. I felt I was in control over the situation.	*.757*	.068	.601
18. I knew I was able to solve the task.	*.739*	.009	.549
1. I knew exactly what I had to do, and I acted accordingly.	*.725*	.017	.531
19. This task was not too difficult.	*.692*	-.130	.455
4. I felt that what I had to do matched my skills well.	*.658*	.165	.510
1. I could effortlessly perform well.	*.645*	-.112	.395
22. My skills were in balance with the challenges of the activity.	.644	*.082*	.445
5. My mind worked in total harmony with my body.	.630	*.086*	.429
8. My attention was not engrossed at all by the activity.	.112	-*.828*	.655
12. It was boring for me.*	.102	-*.824*	.651
6. The activity totally engrossed my attention.	-.023	*.814*	.654
3. I forgot about the progress of time all along.	-.069	*.812*	.638
16. I found the task interesting.	.085	*.773*	.575
2. I forgot about the progress of time.	.123	*.681*	.517
7. Time passed faster than I thought it did.	.035	*.628*	.405
2. I fused with the task.	.274	*.607*	.520
11. I forgot about my close environment.	.101	*.543*	.330

Notes. The factor loadings of each factors are with italic numbers (Factor1: Balance of challenges and skills factor; Factor2: Absorption in the task factor); * signs a reverse-scored item.

Reliability is acceptable in both factors ($Cr\alpha_{C\text{-}S}$ = .921; $Cr\alpha_{A}$ = .907). Intercorrelation between the two factors is low and significant (r = .221, p < .01). The two factors support the theoretical hypothesis which states that the basic deterministic factors of flow are balance between skills and challenges, and then absorption in the task, so they are the essential conditions of flow experience.

Discussion

In this research the focus was on the measuring methods of flow experience. The primary aim was to develop a correct questionnaire which has empirical basis, but it can be well-interpreted in the frames of Csíkszentmihályi's original theory (Csíkszentmihályi, 1975/2000) and can be used in several different situations (activity/survey approach, Novak & Hoffmann, 1997). Until these days there have not been too many exploratory research which overstepped the theoretical concept of flow and aimed to find an autonomous structure (Delle Fave, Massimini & Bassi, 2011; Novak, Hoffmann & Duhachek, 2003), as well as examined the existence of a possible dimensional construction which may be different from the original theoretical description of flow experience.

The development of the PPL-FSQ finally resulted in a structure of two factors of 20 items which can be well interpreted. The first version of the PPL-FSQ was developed on theoretical basis, every item belonged to the original factors (Csíkszentmihályi, 1975/2000; Kawabata & Mallett, 2011), and thus there was a possibility to have a result of the hypothetical factor structure. According to our analysis, flow experience can be identified with two meta-dimensions: Balance between challenges and skills and Absorption in the task. These two factors include the other dimensions of the original conception – items about clear goals, control, concentration, transformation of time perception.

The Balance between challenges and skills factor refers to the activity (the context) – it covers the areas of skills-challenges balance, control and clear goals. In the early ESM studies Csíkszentmihályi, Rathunde and Whalen (2010) defined flow experience as the optimal rate of perceived challenges and skills (both of them are on high levels and in balance with each other). Kawabata and Mallett (2011) found that when there is balance between skills and challenges, the person is likely to get into the flow channel.

The Absorption in the task factor refers to living through the experience – it is about engagement, the quality of the experience and the accompanying factors of it (change of time perception, forgetting about the environment). Csíkszentmihályi (1997) defined flow as a state with deep absorption, which is intrinsically enjoyable and means total attention focus on the activity and solving of the task. Absorption in the task depends on the attitude of the person towards the activity (Diaz, 2011), whether there is the mobilizable, essential potential for development. There are some proximal factors considered in developing flow (Kawabata & Mallett, 2011): high and optimal rate of challenges and skills are needed to achieve the possibility to get into the flow channel, as well as the subjective experience, the operation in the flow channel itself has its own characteristics, which are identified by the absorption in the task.

The main limitation of the presented research is studying flow in specific contexts; in some cases under laboratory conditions, which may decrease its ecological validity because circumstances may have had an influence on the completion of the surveys.

In the presented studies the first step of the PPL-FSQ development was executed by post hoc analysis and exploratory factor analysis. The future task is to make confirmatory factor analysis in different contexts, samples [even in an international, cross-cultural frame for checking the question of universality, as Csíkszentmihályi and Csíkszentmihályi (1988) said the context of flow varies in

each culture, but its dynamics is universal (Moneta, 2004)], activities, and situations, so the adequacy of the resulted two-factor structure in this research can be supported. Another remarkable question whether the questionnaire and its factors are able to differentiate between flow and non-flow experiences in different inductive contexts (Delle Fave, Massimini & Bassi, 2011). It is reasonable to examine the PPL-FSQ by structural equation modeling: the whole theoretical model can be tested and the sub-factors can be revealed under the two meta-dimensions.

This presented research supports the hypothesis that flow experience has two indispensable basic factors: the balance between the person's skills and the challenges of the situation, and then the absorption with the activity that is being done by the person which is in accordance with Csíkszentmihályi's flow concept (Csíkszentmihályi, Abuhamdeh & Nakamura, 2005).

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