

## IMPULSIVITY AND AGGRESSION IN THE SYSTEM LOWER SECONDARY EDUCATION IN SLOVAK AND CZECH REPUBLIC

<sup>a</sup>ROBERT TOMŠÍK, <sup>b</sup>MARTIN DOLEJŠ, <sup>c</sup>MICHAL ČEREŠNÍK, <sup>d</sup>JAROSLAVA SUCHÁ, <sup>e</sup>ONDŘEJ SKOPAL, <sup>f</sup>MIROSLAVA ČEREŠNÍKOVÁ

<sup>a</sup>Constantine the Philosopher University, Faculty of Education, Dražovská 4, Post code: 949 74, Nitra, Slovakia, email:

<sup>a</sup>robert.tomsik@ukf.sk, <sup>b</sup>martin.dolejs@upol.cz

<sup>c</sup>mceresnik@ukf.sk, <sup>d</sup>Jaroslava.Sucha@email.cz

<sup>e</sup>ondrej.skopal@upol.cz, <sup>f</sup>mceresnikova@ukf.sk

Paper is published within the frame of the projects: 1) VEGA 1/0122/17 Risk behavior and attachment of the adolescents aged from 10 to 15.; 2) IGA\_FF2017\_001 – Diagnostika místa kontroly (locus of control) a jeho využití při práci s adolescenty ve věku 11-15 let (běžná populace, klienti NZDM).

**Abstract:** Our research design is based on the assumption that impulsivity and aggression are closely related. The investigation is focused on differences in the aggressive behaviour of students with average and high rates of impulsivity. The research sample consists of 5841 pupils in the Czech Republic and the Slovak Republic aged 10-15 years. Impulsivity was measured by Impulsiveness Scale (SIDS). Impulsivity is conceived as a one-dimensional construct. Aggressive behaviour was determined with Buss-Perry Aggression Questionnaire (BPAQ) that consists of scores for: (1) physical aggression, (2) verbal aggression, (3) anger and (4) hostility. A statistical analysis revealed significant differences in aggressiveness between research groups, which differed in impulsivity levels. This supports the assumption of a relationship between aggression and impulsivity.

**Keywords:** impulsivity, aggressive behaviour, hostility, socio-cultural differences, adolescence.

### 1 Introduction

Impulsiveness is basically the tendency to act without thinking. Brunelle et al. (2009) reported that it is a tendency to respond quickly to cues associated with reward, without enough time to consider long-term consequences. Impulsiveness has, according to Eysenck, deep biological roots (In Vazire & Funder, 2006), including lower serotonin and specific patterns of activity in the neocortex. Impulsivity also appears to be hereditary (In Vazire & Funder, 2006). Mustanski et al. (In Brunelle et al. 2009) reported that in neurobiological terms, impulsivity inherently includes self-regulatory deficit and poor capacity to think with respect to social norms. This is related for example to the observed relationship between impulsivity and risky sexual behaviour and other antisocial behaviour, or aggressive behaviour, which impulsivity is often confused with (Critchfield, Levy & Clarkin, 2004; Finn et al. 2000; Krueger et al. 2002; Skopal, Dolejš & Suchá, 2014). Aggressive behaviour and impulsivity are concepts that often confused (García-Forero, 2008), with some authors even considering them the same personality factor (Critchfield, Levy & Clarkin, 2004; Coccaro et al. 1989; Siever and Davis, 1991). Although these two phenomena undoubtedly share the same process of development, they are not synonyms.

#### 1.1 Theoretical framework

According to Eysenck (1993; In Spinella, 2004; Vazire & Funder, 2006; Zuckerman, 1995) impulsivity is biologically determined. In 1995 Zuckerman (In Zuckerman & Kuhlman, 2000) devised a biochemical concept, in which he clarifies personality traits (sociability, impulsive sensation seeking) associated with risky behaviour; sensation seeking also refers to an assessment scale that includes the factors of impulsivity and sensation seeking (Zuckerman, 1994; In Zuckerman & Kuhlman, 2000). The biochemical model focuses on the influence of neurotransmitters, hormones and enzymes. It is reported that lower levels of the monoamine oxidase enzyme are associated with behaviour linked to sensation seeking (including impulsivity), extroversion, sociability and behavioural addictions, i.e. abuse of alcohol, tobacco, illegal drugs or sexual activities.

Impulsivity is one of the characteristics of human behaviour that affects various areas of life. In extreme forms, it is linked to psychopathology (Grygorian, 2012). Higher impulsivity

accompanies varied neuropsychological conditions such as bipolar disorder, suicidal tendencies, attention deficit hyperactivity disorder (ADHD), borderline personality disorder, antisocial personality disorder, and behavioural disorders (DSM-V, Raboch et al. 2015) or various forms of high-risk behaviours (Skopal, Dolejš & Suchá, 2014).

The dictionary of psychology (Hartl & Hartlová, 2000) defines impulsivity as the tendency of a personality to act suddenly, on a whim, without considering the consequences. Impulsivity as defined by APA (2007) is a behaviour characterized by little or no forethought, reflection, or consideration of the consequences. It may also be associated with risk-taking behaviour. Zuckerman and Kuhlman (2000, 1000) reported that impulsivity is a "tendency to enter into situations, or rapidly respond to cues for potential reward, without much planning or deliberation and without consideration of potential punishment or loss of reward". While in this case impulsivity is described as a rapid response to reward, the authors also report further in the text that impulsivity is characterized by intolerance to negative emotions.

In order to understand the etiology and origin of aggressive behaviour in relation to impulsivity, a clear definition and distinction need to be made. Aggression is often compared to "anger" or "hostility". Some experts, however, define these terms as separate concepts, rejecting them as synonyms (García-Forero, 2008; Suris et al. 2004).

Some authors (e.g. Coccaro, 1998) propose that the lack of conceptual distinction between the terms may be used to represent the target behaviour. Clear criteria for investigation of the constructs need to be specified in order to eliminate confusion on the conceptual or methodological level. Some authors (e.g. Suris et al. 2004) indicate that these variables are interconnected through higher order constructs to the degree that they share variances. As noted above, impulsivity is defined as "a predisposition toward rapid, unplanned reactions to internal or external stimuli without regard to the negative consequences" (Moeller et al. 2001, 1784). This definition describes impulsivity as a personality trait, understanding it as a tendency to trigger responses to stimuli. These concepts have been interchanged in many empirical studies. For example Dolan et al. (2001) studied the relationship between impulsivity, aggression and serotonin function on a sample of offenders with personality disorder. The authors reported that "it was difficult to distinguish between impulsivity and aggression." Considerable efforts have been devoted to the classification of aggressive behaviour. Barratt & Slaughter (1998) classified the aggression into three categories: *pre-meditated, medically-related, and impulsive aggression*. Coccaro (1998) took this a step further and defined *impulsive aggression* as unintentional aggressive behaviour.

*Impulsive aggression* is defined in a number of ways, for example as: a trait (Coccaro et al. 1989; Siever & Davis, 1991); a subset of impulsive behaviours (Seroczynski et al. 1999); a subset of aggressive behaviours (Barratt et al. 1994; Barratt, et al. 1999); as their combination or interaction of separate characteristics (Depue & Lenzenweger, 2001). Due to the ambiguity of definitions, classification of impulsivity is relatively unclear (Critchfield, Levy & Clarkin, 2004, 558). On the other hand Critchfield, Levy & Clarkin (2004) highlight the fact that impulsivity and aggression are expected to co-occur on the phenotypic level, which justifies the use of *impulsive aggression* as a phenomenon of a similar dimension (García-Forero, 2008).

As regards the assessment of impulsive aggression, Coccaro and his team (Coccaro, 1998; Coccaro et al. 1998) devoted much effort to defining the difference between the concepts of impulsivity and aggression (Olvera et al. 2001). Coccaro focused on detecting the degree and correlation of aggression and impulsivity in adolescents in the concept of intermittent explosive disorder (IED). While Coccaro and his team do not regard impulsivity and aggression as interchangeable, they are

unable to explain the difference between the concepts as although patients with IED had a higher impulsivity score, it was not statistically significant.

Our paper mentions only a few examples of the ambiguity in this field. Some scientists cite "*aggression*" referring to "*aggressiveness*", others cite "*impulsive aggression*" referring to "*aggression*" (García-Forero, 2008). This leads to scientific deficiency that could result in errors in the interpretation of research results in relation to the theoretical framework. As reported by some authors, impulsivity and aggression are probably dispositions. Aggression is an observable behaviour and an impulse a driving force. It could be argued that the finding that impulsive and aggressive behaviours are associated with the functioning of the same biological mechanisms (Frankle et al. 2005; Seroczynski et al. 1999) could imply that there is a relationship between the two constructs, and even that they function as a single trait-like dimension. In order to solve this problem, Critchfield, Levy & Clarkin (2004) studied the relationships between *impulsivity*, *aggression* and *impulsive aggression* in individuals with borderline personality disorder. Relying on an analysis of principal components, they examined *impulsive aggression* as a single phenotypic dimension and established that impulsivity and aggression are separate constructs. The small size of the research sample, however, prevents authors from drawing general conclusions. Webster and Jackson (1997) describe several methods for impulsivity assessment. One of the options is diagnostic interview, a tool serving to detect selected impulsive problems. Furthermore, the authors discuss observation of a subject by parents and teachers. Impulsivity can also be assessed using neurobiological tests and cognitive tasks. Another method is self-report scales that rely on the subject's subjective evaluation, which are used for assessment of aggressive behaviour and impulsivity in our research.

Based on the preceding studies, we assume that impulsivity and aggression are closely related. Under this assumption, our research aims to identify the rates of impulsive and aggressive behaviour on a sample of students aged 10 to 15 years. In particular, we will focus on the differences in aggressive behaviour relative to the rate of impulsive behaviour in students, hypothesising that high-impulsive students will differ in their higher levels of aggressive behaviour as compared with students with low and average impulsivity.

## 1.2 Research sample

The representative research sample consists of approximately 5841 students of grades 5 to 9 of primary schools, eight-year grammar schools and six-year grammar schools in the Czech Republic (N = 4089) and the Slovak Republic (N = 1752). The mean age of the adolescents was 12.82 years with a standard deviation of 1.34 year (Slovakia M = 12.44; Czech Rep. M = 12.99). Of the total number of students, 48.3% were boys and 51.7% girls. The population in the Czech Republic consisted of approximately 349000 children of the given age range. In Slovakia it was about 230000 children. Dolejš, Skopal and Suchá tested approximately 1.2% of the population, and Čerešník tested approximately 0.8% of the population. The research sample was split into two groups depending on the impulsivity rates: average-impulsive students and high-impulsive students. The first group included students who scored up to "mean + 1 standard deviation" on the impulsivity scale. The other group included students who scored higher than

"mean + 1 standard deviation". Clinical experience shows that these students tend to behave more aggressively than students with low or mean levels of impulsivity. In the results this distinction is named as "average" and "high" impulsivity.

## 1.3 Methods

The Impulsiveness Scale designed by Dolejš and Skopal (Czech version: Dolejš, Skopal (2016); Slovak version: Čerešník, Dolejš, Skopal (2016)) is a measure for the identification of impulsivity levels in adolescents over a short period of time. SIDS is a screening tool used for clinical testing (psychologist), education (school psychology) and counselling (psychology, special education). Its 24 items examining the impulsivity factor were generated from mathematical and statistical analyses. The final version of SIDS contains 24 items that generally correlate with the total score in the range of  $r = 0.19$  through  $r = 0.65$ ; the majority is thus in the moderate relationship range, at a significance level of  $p < 0.001$ . The factor loading ranges from 0.13 to 0.68 (Dolejš & Skopal, 2016; Čerešník, Dolejš & Skopal, 2016). The SIDS aggression scale thus comprises a total of 24 items, of which four are reverse. The response score may range from 24 up to 96 points. A higher score equals a higher degree of impulsivity. As part of the research, we also investigated the internal consistency of the tool using Cronbach's  $\alpha$ . In both the Slovak and Czech versions it equalled 0.86.

Buss-Perry Aggression Questionnaire (BPAQ) is based on the premise that aggression is a complex phenomenon, and it is therefore necessary to divide aggressive behaviours in several subgroups. Consequently, we will be able to establish the overall aggression of a subject as well as the way aggression manifests specifically in the said subject. Published in 1992, Buss-Perry Aggression Questionnaire quickly became the gold standard for the measurement of aggression (Gerevich, Bacskai & Czobor, 2007). Several validation studies have been carried out: e.g. Argentina, Netherlands, Chile, and Turkey. The authors of the questionnaire understand aggression as a personality trait comprised of four components. The BPAQ aggression questionnaire is made up of 29 items and measures four dimensions of aggression (Buss & Perry, 2002):

- 1) *Physical aggression* (PA) involves physical hurting or harming of others and represents the instrumental or motor component of behaviour;
- 2) *Verbal aggression* (VA) involves verbal hurting or harming of others and represents the instrumental or motor component of behaviour;
- 3) *Anger* (A) involves physiological arousal (preparation for aggression) and represents the emotional and affective component of behaviour;
- 4) *Hostility* (H) consists of feelings of ill will and injustice and represents the cognitive component of behaviour.

## 2 Results

Tables 1 to 4 show the results of the statistical analyses. The statistical analyzes were processed using the IBM SPSS 20 statistical programme. Based on the results of Kolmogorov-Smirnov test, distribution of dataset is normal and for further analysis parametric test was chosen (Tomšik, 2017). Differences in *physical aggression*, *verbal aggression*, *anger* and *hostility* among students of various research categories were investigated using the Student t-test. Descriptive statistics are presented in the Tables 1 and 2.

Table 1. Descriptive statistics of the research variables in Slovak research sample.

	N	MIN	MAX	M	SEM	SD	S	C
Impulsivity	1483	24	94	56.70	.279	10.739	.024	.447
Physical aggression	1700	9	45	22.91	.181	7.470	.375	-.446
Verbal aggression	1752	5	25	14.59	.092	3.852	.052	-.082
Anger	1717	7	34	17.96	.117	4.841	.281	-.341
Hostility	1711	8	40	22.83	.146	6.043	.012	-.278

N - number; Min - minimum score; Max - maximum score; M - mean; SEM - standard error of mean; SD - standard deviation; S - skewness; C - kurtosis.

Table 2. Descriptive statistics of the research variables in Czech research sample.

	N	MIN	MAX	M	SEM	SD	S	C
Impulsivity	4089	24	92	58.48	.155	9.905	-.002	.264
Physical aggression	3908	9	45	22.61	.122	7.651	.344	-.452
Verbal aggression	3916	5	25	15.48	.062	3.857	-.042	-.197
Anger	3910	7	35	19.60	.086	5.350	.084	-.406
Hostility	3896	8	40	24.53	.097	6.034	-.180	-.356

*N* - number; *Min* - minimum score; *Max* - maximum score; *M* - mean; *SEM* - standard error of mean; *SD* - standard deviation; *S* - skewness; *C* - kurtosis.

The research group of Slovak students had *N* = 1173 (84.1%) of average-impulsive and *N* = 221 (15.9%) of extremely impulsive students. When comparing the research groups using the BPQA variables, we found statistically significant differences in aggression across all the subscales at the statistical significance of  $p < 0.001$  (physical aggression  $t = 14.396$ ,  $p < 0.001$ ; verbal aggression  $t = 14.079$ ,  $p < 0.001$ ; anger:  $t = 14.481$ ,  $p < 0.001$ ;

hostility:  $t = 10.524$ ,  $p < 0.001$ ; Table 3). Risk-impulsive adolescent scored a higher average in all monitored variables, compared with the average-impulsive adolescents. Specifically, risk-impulsive adolescents scored 7.39 higher in *physical aggression*, 3.71 higher in *verbal aggression*, 4.81 higher in *anger*, and 4.51 higher in *hostility* compared to the average-impulsive adolescents.

Table 3. Comparison of Slovak adolescents in BPQA variables by impulsivity.

	Impulsivity	N	M	SD	SEM	df	t	p
Physical aggression	High	221	29.03	7.546	.508	1392	14.396	< .000
	Average	1173	21.64	6.900	.201			
Verbal aggression	High	222	17.84	3.397	.228	1432	14.079	< .000
	Average	1212	14.13	3.646	.105			
Anger	High	222	22.03	4.954	.332	1410	14.481	< .000
	Average	1190	17.22	4.460	.129			
Hostility	High	222	26.76	5.968	.401	1405	10.524	< .000
	Average	1185	22.25	5.837	.170			

*N* - number; *M* - mean; *SD* - standard deviation; *SEM* - standard error of mean; *df* - degrees of freedom; *t* - Student *t* test; *p* - statistical significance.

When comparing the Czech average-impulsive (*N* = 3733; 96.7 %) and risk-impulsive students (*N* = 121; 3.14 %) using the BPQA variables, we found statistically significant differences in aggression across all the subscales at the statistical significance of 0.001 (physical aggression  $t = 14.633$ ,  $p < 0.001$ ; verbal aggression  $t = 11.016$ ,  $p < 0.001$ ; anger:  $t = 15.585$ ,  $p < 0.001$ ; hostility:  $t = 9.603$ ,  $p < 0.001$ ; Table 4). Risk-impulsive students

scored a higher average in all monitored variables, compared with the average-impulsive adolescents. Specifically, extreme-impulsive adolescents scored 10.07 higher in *physical aggression*, 3.87 higher in *verbal aggression*, 7.49 higher in *anger*, and 5.34 higher in *hostility* compared to the average-impulsive adolescents.

Table 4. Comparison of Czech adolescents in BPQA variables by impulsivity.

	Impulsivity	N	M	SD	SEM	df	t	p
Physical aggression	High	121	32.36	7.620	.693	3852	14.633	< .000
	Average	3733	22.29	7.451	.122			
Verbal aggression	High	121	19.24	3.717	.338	3861	11.016	< .000
	Average	3742	15.37	3.804	.062			
Anger	High	121	26.86	4.543	.413	3854	15.585	< .000
	Average	3735	19.37	5.224	.085			
Hostility	High	119	29.73	5.611	.514	3842	9.603	< .000
	Average	3725	24.39	5.987	.098			

*N* - number; *M* - mean; *SD* - standard deviation; *SEM* - standard error of mean; *df* - degrees of freedom; *t* - Student *t* test; *p* - statistical significance.

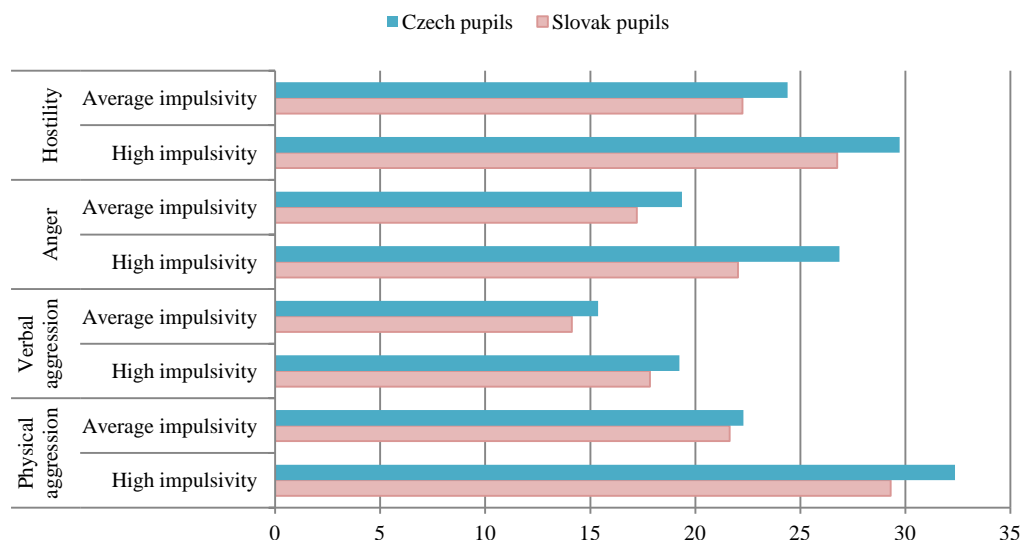


Figure 1 The average values of aggressiveness variables in the relation to the impulsivity in Slovak and Czech sample

The results are summarized in Figure 1. We can see that the group with high level of impulsivity (more than mean + 1 SD) reached the higher score of aggressiveness in all subscales in the comparison with the group with average level of impulsivity (up to mean + 1 SD). The order based on the average score was: physical aggression, hostility, anger, verbal aggression both in Slovak and Czech sample. We can also see that Czech adolescents were more aggressive, however in the Czech research sample there is a smaller percentage of aggressive students. This difference was significant except for verbal aggression. And that was the reason of separate analysis of Slovak and Czech sample.

### 3 Discussion

Impulsiveness comes from the root word 'impulse'. According to the principles of bioenergetics (Lowen, 2009) an impulse occurs upon contact of a (human) body with the environment; it is a flow of energy directed towards the periphery of the body. Together with this process, the body is confronted with stimuli from the external environment. In a healthy organism, pulsating energy may thus continuously transform into predictable behaviour that is beneficial to the individual and harmless to other people. The humanistic interpretation (e.g. Rogers, 2014) argues that congruence is one of the preconditions of a fully-functioning personality.

The developing organism, however, is limited by socio-cultural norms that determine what is desirable and what is not in terms of society's reproducibility. The humanistic tradition mentions conditions of valuation that threaten the process of personality development. From the perspective of bioenergetics, this involves "bracing oneself", a process of separating inner feelings from the peripheral areas of the body, which impairs integrity of the body and the world. Although the person has a relatively high energy potential, this potential is not made use of in line with the true needs of the body, and ultimately the individual is highly likely to develop a psychopathic character (Lowen, 2009), characterized by emotional dissociation and a tendency to control other people. With this character structure on mind, we may identify frustration, induced by poor saturation of psychological needs. A typical reaction to frustration is aggressive behaviour in the form of self-punishment or punishment of others.

Analysis of the data suggests that there is a relationship between impulsivity and aggression (our assumption can be supported) and that these two variables share the same process of development. Its interpretation depends on the concept or theory

that is set as crucial. Our interpretation is grounded in the bioenergetics and humanistic approach. This explains aggressive behaviour of risk-impulsive adolescents as a consequence of an inadequate family environment. Due to this environment, a developing adolescent suffered loss of contact with their body, loss of self-understanding and loss of capacity to understand self-related feelings. In connection with the integration process that takes place in the brain as collaboration between the prefrontal cortex and the limbic system, which is part of the rational-emotional regulations of behaviour, such a development hinders any progressive use of the energy potential of the organism.

A challenge that emerges as part of anticipated interventions is to utilise this life force of at-risk adolescents so that it is not limited by frustration and aggression. This means strengthening self-awareness, introducing a healthy lifestyle, and in extreme cases even abreaction therapy.

Another research challenge is the triangulation of methods that diagnose impulsive behaviour, as well as a greater emphasis on the ecological validity of the generated results and experimental design of research projects in the sense of diagnostic work with real high-risk situations in which the adolescent population may find themselves.

### Literature:

1. Barratt, E. S., & Slaughter, L.: Defining, measuring, and predicting impulsive aggression: a heuristic model. *Behavioral Sciences and the Law*, 1998, 16, p. 285–302.
2. Barratt, E. S., Monahan, J., & Steadman, H. J.: *Impulsiveness and Aggression, Violence and Mental Disorder: Developments in Risk Assessment*. Chicago: University of Chicago Press, 1994.
3. Barratt, E. S., Stanford, M. S., Dowdy, L., Liebman, M. J., & Kent, T. A.: Impulsive and premeditated aggression: a factor analysis of self-reported acts. *Psychiatry Research*, 1999, 86, p. 163–173.
4. Brunelle, C., Douglas, R. L., Pilh, R. O., & Stewart, S. H.: Personality and Substance Use Disorders in Female Offenders: A Matched Controlled Study. *Personality and Individual Differences*, 2009, 46, p. 472–476.
5. Buss, A. H., & Perry, M.: The Aggression Questionnaire. *Journal of Personality and Social Psychology*, 1992, 63(3), p. 452–459.
6. Coccaro, E. F.: Impulsive aggression: a behavior in search of clinical definition. *Harvard Review of Psychiatry*, 1998, 5, p. 1–4.
7. Coccaro, E. F., Kavoussi, R. J., Berman, M. E., & Lish, J. D.: Intermittent explosive disorder-revised: development, reliability,

- and validity of research criteria. *Comprehensive Psychiatry*, 1998, 39, p. 368–376.
8. Coccaro, E. F., Siever, L. J., Klar, H. M., Maurer, G., Cochrane, K., Cooper, T. B., Mohs, R. C., & Davis, K.: Serotonergic studies in patients with affective and personality disorders. Correlates with suicidal and impulsive aggressive behavior. *Archives of General Psychiatry*, 1989, 46, p. 587–599.
9. Critchfield, K., Levy, K., & Clarkin, J.: The relationship between impulsivity, aggression, and impulsive-aggression in borderline personality disorder: an empirical analysis of self-report measures. *Journal of Personality Disorders*, 2004, 18, p. 555–570.
10. Čerešník, M., Dolejš, M., Skopal, O.: *Škála impulzivity Dolejš a Skopal (SIDS). Příručka pro prax*. Olomouc: Univerzita Palackého, 2016.
11. Depue, R. A., & Lezenwerger, M. F.: A neurobehavioral dimensional model. In J. W. Livesley, (Ed.), *Handbook of personality disorders: theory, research and treatment* (p. 136–176). Guilford Press, New York, 2001.
12. Dolan, M., Anderson, I. M., & Deakin, J. F. W.: Relationship between 5-HT function and impulsivity and aggression in male offenders with personality disorders. *British Journal of Psychiatry*, 2001, 178, 352–359.
13. Dolejš, M., Skopal, O.: *Škála impulzivity Dolejš a Skopal (SIDS). Příručka pro prax*. Olomouc: Univerzita Palackého, 2016.
14. Finn, P. R., Sharkansky, E. J., Brandt, K. M., & Turcotte, N.: The effects of familial risk, personality, and expectancies on alcohol use and abuse. *J Abnorm Psychol*, 2000, 109(1), p. 122–133.
15. Frankle, W. G., et al.: Brain serotonin transporter distribution in subjects with impulsive aggressivity: A Positron Emission Study With [11C]McN 5652. *American Journal of Psychiatry*, 2005, 162, p. 915–923.
16. García-Forero, C., et al.: Disentangling impulsiveness, aggressiveness and impulsive aggression: An empirical approach using self-report measures. *Psychiatry Research*, 2008, 168, p. 40–49.
17. Gerevich, J., Bácskai, E., & Czobor, P.: The generalizability of the Buss-Perry Aggression Questionnaire. *International Journal of Methods in Psychiatric Research*, 2007, 16(3), p. 124–136.
18. Grigoryan, G. A.: Serotonin and impulsivity (animal experiments). *Neuroscience and Behavioral Physiology*, 2012, 42(8), p. 85–894.
19. Hartl, P., & Hartlová, H.: *Psychologický slovník*. Praha: Portál, 2000.
20. Krueger, R. F., Hicks, B. M., Patrick, C. J., Carlson, S. R., Iacono, W. G., & McGue, M.: Etiologic connections among substance dependence, antisocial behavior, and personality: modeling the externalizing spectrum. *J Abnorm Psychol*, 2002, 111(3), p. 411–424.
21. Lowen, A.: *Bioenergetika. Terapie duše pomocí práce s tělem*. Praha: Portál, 2009.
22. Moeller, F., Barratt, E., Dougherty, D., Schmitz, J., & Swann, A.: Psychiatric aspects of impulsivity. *American Journal of Psychiatry*, 2001, 158, p. 1783–1793.
23. Olvera, R. L., Pliszka, S. R., Konyecsni, W. M., Hernandez, Y., Farnum, S., & Tripp, R. F.: Validation of the Interview Module for Intermittent Explosive Disorder (M-IED) in children and adolescents: a pilot study. *Psychiatry Research*, 2001, 101, p. 259–267.
24. Rogers, C. R.: *Způsob bytí. Klíčová témata humanistické psychologie z pohledu jejího zakladatele*. Praha: Portál, 2014.
25. Seroczynski, A. D., Bergeman, C. S., & Coccaro, E. F.: Etiology of the impulsivity/aggression relationship: genes or environment? *Psychiatry Research*, 1991, 86, p. 41–57.
26. Siever, L. J., et al.: d,l- Fenfluramine response in impulsive personality disorder assessed with [18F] fluorodeoxyglucose positron emission tomography. *Neuropsychopharmacology*, 1999, 20, p. 413–423.
27. Skopal, O., Dolejš, M., & Suchá, J.: *Vybrané osobnostní rysy a rizikové formy chování u českých žáků a žákyň*. Olomouc: FF, Univerzita Palackého, 2014.
28. Suris, A., et al.: Measures of aggressive behavior: overview of clinical and research instruments. *Aggression and Violent Behavior*, 2004, 9, p. 165–227.
29. Raboch, J. a kol.: *DSM-V. Diagnostický a štatistický manuál duševních poruch*. Praha: Hogrefe – Testcentrum, 2015.
30. Tomšík, R.: *Kvantitativný výskum v pedagogických vedách: Úvod do metodológie a štatistického spracovania*. Nitra: PF UKF, 2017, 505 p.
31. Vazire, S., & Funder, D. C.: Impulsivity and the Self-Defeating Behavior of Narcissists. *Personality & Social Psychology Review*, 2006, 10(2), p. 154–165.
32. Webster, CH. D., & Jackson, M. A.: *Impulsivity: Theory, Assessment, and Treatment*. New York: Guilford Press, 1997.
33. Zuckerman, M.: Good And Bad Humors: Biochemical Bases of Personality and Its Disorders. *Psychological Science (Wiley-Blackwell)*, 1995, 6(6), p. 325–332.
34. Zuckerman, M., & Kuhlman, D.: Personality and risk-taking: common biosocial factors. *Journal Of Personality*, 2000, 68(6), p. 999–1029.

**Primary Paper Section: A****Secondary Paper Section: AM, AN, AO**