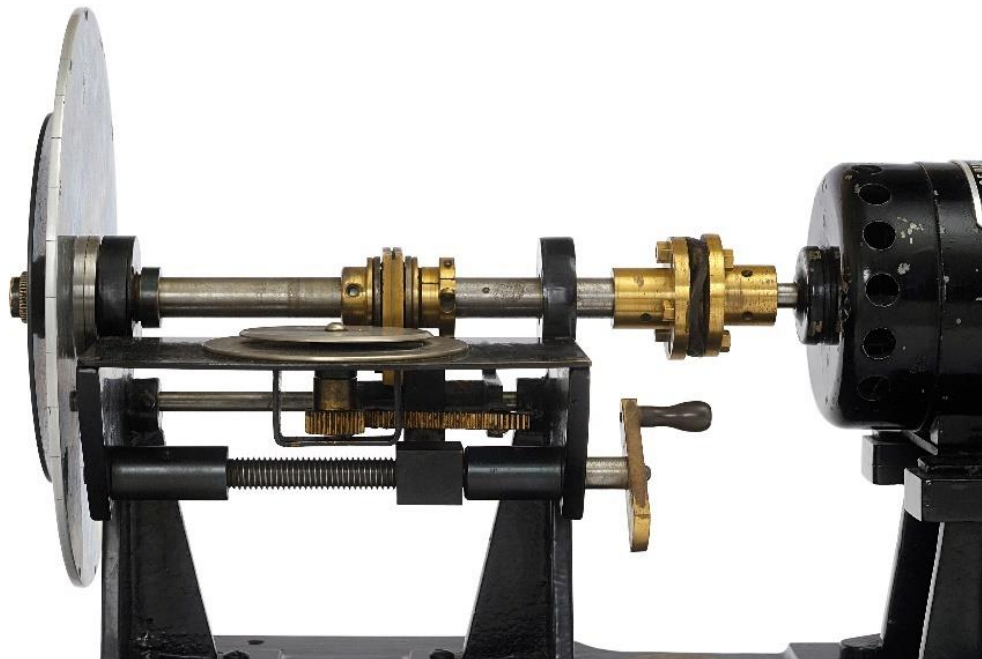


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EMPIRICAL STUDIES IN PSYCHOLOGY

OCTOBER 15TH – 18TH, 2020

FACULTY OF PHILOSOPHY, UNIVERSITY OF BELGRADE



INSTITUTE OF PSYCHOLOGY
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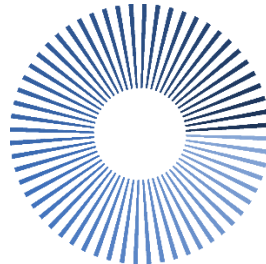
EMPIRICAL STUDIES IN PSYCHOLOGY

OCTOBER 15TH – 18TH, 2020

FACULTY OF PHILOSOPHY, UNIVERSITY OF
BELGRADE



Institute of Psychology, Faculty of Philosophy, University of Belgrade



Laboratory for Experimental Psychology, Faculty of Philosophy, University of Belgrade

Belgrade, 2020

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CLINICAL PSYCHOLOGY

Examination of the factorial structure of the Mental Help Seeking Attitudes Scale – MHSAS: one instructive example

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Abstract

The aim of this study was to examine the factorial structure of the Serbian version of Mental Help Seeking Attitudes Scale (MHSAS) on a sample of adolescents. The sample consisted of 390 Belgrade high school students. The unexpected and uninterpretable two-factor structure suggested by EFA and CFA on the entire sample showed a consistent grouping of items with respect to the spatial (left-right) arrangement of negatively-valenced (NV) and positively-valenced (PV) adjectives in pairs. EFA and CFA without 28 participants (7.2% of the entire sample) identified as inattentive respondents provided a clear one-factor solution. The analysis excluded cases where the difference between mean scores for items with a NV adjective on the left and those with a NV adjective on the right was equal or larger than half of the response scale range (i.e. ≥ 3). The results suggest that MHSAS has unidimensional structure. In order to use MHSAS in its current form, it is necessary to include a certain indicator of the respondent's inattentive responding, such as the one proposed in this paper, to detect invalid protocols. On a more general level, the results support the position according to which it is desirable to add reverse-keyed items, i.e. negatively formulated items that are assumed to evaluate the same construct as the positively formulated ones when constructing a questionnaire.

Keywords: Mental Help Seeking Attitudes Scale (MHSAS); factorial structure; inattentive responding; questionnaire

Introduction

In order to overcome the observed psychometric shortcomings of the three existing questionnaires (relatively low reliability, inconsistent factor structure and measuring unintended constructs, i.e. construct-irrelevant variance) Hammer, Parent and Spiker (2018) constructed the Mental Help Seeking Attitudes Scale (MHSAS). MHSAS was constructed within the theoretical framework of Ajzen's Theory of Planned Behavior and the items for the final version were carefully selected using an IRT approach to achieve one-dimensionality of the questionnaire (Hammer et al., 2018). Since MHSAS is a new instrument, its further psychometric verification with samples of different ages and from different socio-cultural backgrounds is desirable.

The aim of this study was to examine the factor structure of the Serbian version of the MHSAS in a sample of adolescents.

Method

Participants

The sample consisted of 390 high school students (57.9% female), from 14 Belgrade vocational schools and gymnasiums, aged 16 to 19 (mostly eighteen-year-olds - 84.1%).

Procedure

Respondents completed the MHSAS in groups in class. Participation was anonymous.

Measures

MHSAS contains a root phrase (*If I had a mental health concern, seeking help from a mental health professional would be...*) and 9 items – bipolar pairs of adjectives (e.g., Useless vs. Useful, see column Items in Table 1) answered on a seven-point semantic differential scale. In order to control the response strategy of the respondents, the items differ according to the spatial position of the negatively-valenced (NV) and positively-valenced (PV) adjectives in pairs: for four items the NV adjective is on the left side of the answer scale, and for five on the right (see column Items in Table 1).

Data Analysis

Questionnaire factor structure analysis was performed with EFA (using principal axis factor extraction) as well as CFA. Cattell's scree plot (SPSS v. 23) and the outcome of Horn's parallel analysis (macro parallel.sps, O'Connor, 2000) were taken into account when deciding on the number of factors to be retained in the EFA. Since Mardia's multivariate kurtosis for the whole set of items (MVN package, Korkmaz, Goksuluk, & Zararsiz, 2014) was 156.12 ($p < 0.001$), CFA was performed using a robust MLM procedure in the package lavaan 0.6-6 of the statistical system R 3.6.2 (Rosseel, 2012).

Results and discussion

Analysis of the MHSAS factor structure on the entire sample resulted in an unexpected outcome: the two-factor

structure (suggested by both the scree plot and the parallel analysis based on 1000 sets of random data) obtained by promax rotation showed consistent grouping of items with respect to spatial (left-right) layout of NV and PV adjectives in pairs (Table 1, column Entire sample). The first factor accounted for 54.3%, and the second 11.5% of the total common variance of all items. Semantic analysis of adjective pairs did not suggest a meaningful interpretation of the obtained factors. In accordance with the EFA results, the fit indicators of the one-factor model in CFA deviated significantly from the acceptable ones ($SB\chi^2 / df = 10.26$; CFI = .837; TLI = .783; RMSEA = .154, 90% CI [.142–.167], $p < .001$; SRMR = .111).

Since the MHSAS (due to the balanced left-right arrangement of NV and PV adjectives) requires effort and attention for answering, and the test was performed on adolescents, we assumed that it was inattentive responding, i.e. “responding without regard to item content” (Mead & Craig, 2012, p.437) of a certain number of participants that led to an unexpected factor structure. Namely, research shows that the degree of inattentive responding can be increased in questionnaires that require more effort and attention for answering, and that it is relatively more common in young people (Berry et al., 2019). Likewise, earlier simulation studies have shown that the presence of at least 10% of respondents who inattentively respond to a questionnaire can significantly disrupt the conclusions about the factor structure of the questionnaire using EFA and CFA in a questionnaire with a clear one-dimensional factor structure (cf. Schmitt & Stults, 1985; Woods, 2006).

Therefore, we focused further analysis on examining the assumption that inattentive responding could have led to a violation of the factor structure of the questionnaire. The following procedure was used to detect such responding: separate average scores were derived for items in which NV is an adjective on the left and for items in which NV is an adjective on the right. It was found that for 28 (7.2%) respondents the absolute difference between these two scores is equal to or greater than half of the scale range, i.e. of 3. Such a large difference leads to the assumption that these 28 respondents answered inattentively, most likely as if all NV adjectives were on the left, and all PV adjectives were on the right side. By reviewing the individual responses of these respondents, we found that their responses were consistent with the stated assumption. The justification of using half of the scale range as the minimum criterion for detecting respondents who inattentively responded the questionnaire is supported by the results of the robust MM regression, which analyzed the relationship between scores for items with NV adjective on the left and on the right side: MM regression showed that these 28 respondents represent typical structural outliers in the space of these two scores, i.e. outliers that significantly disrupt the trend of the relationship of the two scores that exists in the

majority of data. The coefficient of linear correlation between the two mentioned scores in the group of 28 outliers was -0.98, while in the group of the remaining 262 respondents this coefficient was 0.88.

EFA without the 28 inattentive respondents gave a clear one-factor solution (scree plot and the parallel analysis suggested a one-factor solution). The first factor accounted for 60.5% of the total common variance of all items which had communalities above 0.45, and their saturation with this factor was greater than 0.68 (Table 1, column Sample without 28 inattentive respondents).

The CFA results on the data excluding the 28 inattentive respondents also suggest that the single factor model is an acceptable model ($SB\chi^2 / df = 2.60$; CFI = .968; TLI = .957; RMSEA = .067, 90% CI [.053–.081], $p = .024$; SRMR = 0.039). Mean of standardized item factor loadings was .78, which indicates that items represent quite pure indicators of attitude factor.

The results suggest that when using the MHSAS, it is necessary to include a certain indicator of inattentive responding to the questionnaire, such as the one proposed in this paper, in order to detect invalid protocols. We consider this solution to be better than modifying the questionnaire by placing all NV adjectives on the left and PV adjectives on the right side, because such a modification would make this kind of control impossible.

Modifying the questionnaire by placing all NV adjectives on the left and PV adjectives on the right side would also disable control for the acquiescence response style, i.e. the tendency of the respondents to agree with the item (in the case of MHSAS, to choose an option closer to the PV adjective) regardless of its content. This could lead to a systematic increase in mean scores on MHSAS and, thus, an erroneous assessment of the actual situation in terms of the attitude towards seeking professional psychological help. Failure to control the acquiescence response style could also lead to problems in determining the dimensionality of the questionnaire, as well as an unfounded increase of positive and reduction of negative correlations with other constructs assessed by questionnaires that do not contain reverse-keyed items.

Conclusions

The results of this study are consistent with the assumption that MHSAS has a one-dimensional factor structure. When using this questionnaire, it is necessary to include a certain indicator of inattentive responding in order to detect invalid protocols. In general, when a separate factor that includes only reverse-keyed items appears in the factor structure analysis of a questionnaire, it should be checked whether the existence of such a factor is a consequence of inattentive responding.

Table 1: Factor loadings (above 0.20) for two-factor EFA (entire sample, promax rotation) and one-factor EFA (without 7.2% of inattentive respondents).

Items	Entire sample (N = 390)		Sample without 28 inattentive respondents (N = 362)
	Factor 1	Factor 2	Factor 1
Useless – Useful		.853	.819
Important – Unimportant	.696		.771
Unhealthy – Healthy		.779	.782
Ineffective – Effective		.891	.790
Good – Bad	.905		.813
Healing – Hurting	.753		.684
Disempowering – Empowering		.506	.698
Satisfying – Unsatisfying	.825		.789
Desirable – Undesirable	.877		.844

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PERSONALITY PSYCHOLOGY

CardioPRINT: Individual features hidden in electrocardiogram and impedance-cardiogram

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Abstract

Electrocardiography (ECG) and impedance cardiography (ICG) are biosignals represented with distinctive repetitive patterns, which might be used for extracting features for biometric identification. In this paper, we present a novel hybrid biometric system based on ECG and ICG biosignal analysis with its robustness to emotional load. For each of the 62 respondents (average age 19.9 years ($SD = 0.57$), 85% female) two-minute recordings were acquired for each of the three phases - relaxation, anger-inducing, and post-anger. These signals were then analyzed and used to extract amplitude, temporal and morphology features to construct training and testing sets for classifiers. Two different classification algorithms are employed – Linear and Random Forest – with different feature sets as input. Our results are promising and indicate that combined individual features from ECG and ICG signals recorded during relaxation and induced emotional response can be used for highly accurate (~96%) biometric identification systems. Further studies should be conducted to investigate the possible correlation between these features and personality traits. Additionally, analysis with a larger sample and a higher number of features should be performed to obtain more reliable conclusions.

Keywords: biometry; electrocardiography - ECG; impedance cardiography - ICG; individual differences; random forest classifiers

Introduction

Electrocardiogram (ECG) and impedance-cardiogram (ICG) represent signals that portray electrical activity and mechanical motion of the heart, respectively (Barold,

2003; Kubicek et al., 1970). Ever since they were first described, extensive research has been done – mainly to include both biosignals in a regular clinical practice to monitor and diagnose normal or pathological heart conditions (Mansouri et al., 2018; Yang et al., 2015). On top of their current (ECG) or potential (ICG) use in clinical practice, another interesting field of application has been described in recent decades – individual identification and authentication.

Biometrics is a term referring to personal biological or behavioral characteristics, which can be used to associate an identity with an individual (Jain et al., 1996). In the field of person recognition, the most widely used measure is a fingerprint, because of the abundance of available algorithms for feature extraction, accuracy, and feasibility (Chung et al., 2005). The downside of using fingerprint is that it can be forged, which is why heavy work has been invested in creating parallel and anti-spoofing methods (Uliyan et al., 2020).

The use of ECG as a biometric measure is not a novel idea. It was first described in 2001 and ever since many different signal acquisition and feature extraction models were described. The most important results were that single-lead records of at least five beats, acquired with non-commercial hardware, are sufficient for creating feature sets with high person identification accuracy of more than 90% (Alotaiby et al., 2019; Biel et al., 2001; Chan et al., 2008; Shen et al., 2011). On the other hand, ICG has been used as a biometric measure in a system based on a radiofrequency oscillator with an antenna and

detector, which acquires contactless long-distance ICG for analysis and feature extraction, without comparable results of person recognition (*Analytics for US Patent No. 8232866*).

In this paper, we propose a novel hybrid biometric system consisting of ECG and ICG signals, acquired in different emotional states. Our model is fiducial - amplitude, temporal, and morphology features are extracted out of characteristic waves of both averaged biosignals. Different feature sets are created and then used for classifying individuals with the Linear and Random Forest (RF) model. Finally, feature importance is measured based upon the classification method with the highest accuracy.

Methods

Our analysis included 62 healthy individuals (average age 19.9 years ($SD = 0.57$), 85% female). All analyzed signals were recorded using BIOPAC MP160 equipment with AcqKnowledge software (Biopac Systems, Camino Goleta, USA) with a sampling frequency of 2000 Hz. ECG signal was recorded using lead II electrodes placement – one on the right arm and the other one on the left ankle, with a ground electrode placed on the right ankle. For ICG signal acquisition, four electrodes were placed on the back. We used surface 135SG Ag/AgCl electrodes (Kendall, Dublin, Ireland). Signals were acquired in three intervals (of approximately 2 min duration for each phase):

1. relaxation phase,
2. anger-inducing phase, which was accomplished using audio-guided fantasy technique, in which participants were exposed to audio material and imagined given situation, which is expected to induce anger, and
3. post-anger phase.

Processing and analysis of captured ECG and ICG signals were performed in RStudio IDE (RStudio, PBC, Boston, USA) using R language version 4.0.0. Digital bandpass 5th order Butterworth filters [1, 40 Hz] and [0.5, 40 Hz] were used to pre-process ECG and ICG signals, respectively (Kizakevich et al., 1993). ECG peak locations were extracted using the Pan-Thompkins method, while ICG peaks were extracted as a maximum value between two-time points of consecutive ECG peaks (Sathyapriya et al., 2014). Afterward, all three recording intervals are divided into four non-overlapping windows consisting of 10 beats, which were used to create averaged segments. Locations of other points of ECG and ICG signal were computed from these segments and are shown in Figure 1 (Israel et al., 2005; Wang et al., 2007).

Three types of descriptive features are calculated for each segment: amplitude (RS, RQ, TT1, TT2, CB, CX), temporal (QRS, T, QT, RC, BX), and morphology (T crest and ICG crest), which are used to create different

feature sets for classification (see Fig. 1). The crest factor represents the dominant peak prominence and is calculated as the ratio between peak amplitude and root mean square (RMS) of the wave. Finally, training and test sets were created out of feature sets in a 2:1 randomized ratio for the use in person recognition with Linear and RF classifiers. For 62 subjects, 744 full feature sets were calculated and divided into a 2:1 randomized ratio (496 for train and 248 for test set) for further analysis.

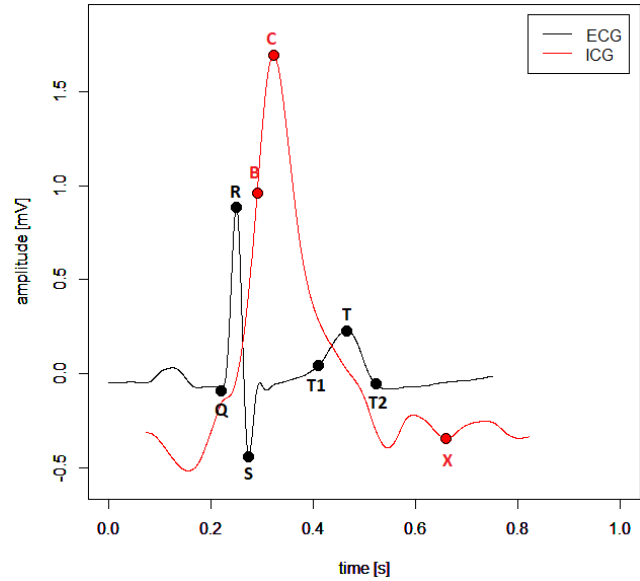


Figure 1. Averaged ECG (black) and ICG (red) signals. Location and notation of characteristic points are shown in respective colors.

Results and discussion

In terms of choosing a classification algorithm for person recognition, we can see from Table 1 that the linear model is not a suitable one, while RF yields a very high accuracy level of more than 93% for three out of four feature sets. When we include features from both ECG and ICG signals, either all or just amplitude and temporal (without crest factors), we see an increase in identification accuracy of 96.2 and 96.4%, respectively. The addition of crest factors into classification decreases accuracy level, which we will explain by analyzing multi-way importance plot, shown in Figure 2. Accuracy decrease (abscissa) is a parameter that correlates with the precision of the classification algorithm when a certain variable is present. Times-a-root (ordinate) represents the number of trees in which a certain variable is at the top of the decision algorithm, which correlates with its sensitivity. This is in a way similar to the mean-min-depth parameter, which

Table 1

Accuracy of Person Recognition, Displayed in Percentages, Using Different Feature Sets and Classifying Algorithms

	Feature Set 1	Feature Set 2	Feature Set 3	Feature Set 4
Linear	34.1	33.5	34.1	17.1
RF	96.2	93.2	96.4	60.5

Note. Feature Set 1 includes all features; Feature Set 2 includes only ECG features; Feature Set 3 includes all temporal and amplitude features; and Feature Set 4 includes only ICG features.

represents the average minimal position inside of all decision trees.

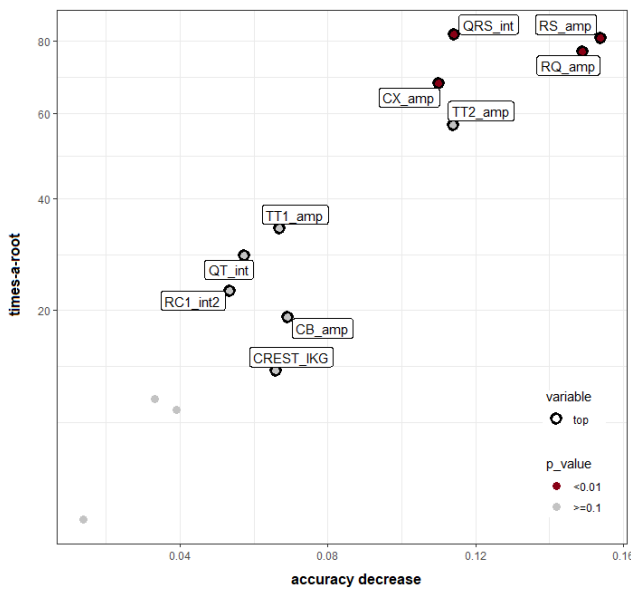


Figure 2. Multi-way importance plot of all

features used in RF classification algorithm. Top features are located on the upper right part of the graph.

Top five features which contribute the most to the accuracy of person recognition are: QRS interval (accuracy decrease 0.11, times-a-root 82, mean-min-depth 2.66, $p < .01$), RS amplitude (0.15, 81, 2.34, $p < .01$), RQ amplitude (0.15, 77, 2.38, $p < .01$), CX amplitude (0.11, 68, 2.88, $p < .01$), and TT2 amplitude (0.11, 57, 3.14, $p = .32$). Four out of five top features are amplitude-based, while the fifth one is the interval of the QRS complex. This can be explained due to the challenging automatic detection of onset (T1) and offset (T2) of T-wave, as well as the ending segment of the ICG signal (X). A shift of points in time inside lower-frequency range segments, while not having a huge effect on relative amplitude between point and peak (R or C), will impact interval

features and RMS value – therefore impact crest factor as well. This is the reason for the decrease in accuracy when all features, including a crest, are used for classification (see Table 1).

Our results are promising and indicate that combined individual features from ECG and ICG signals recorded during relaxation and induced emotional response can be used for highly accurate (~96%) biometric identification systems with relatively simple classifiers. However, a more in-depth analysis of the obtained results and selected features using a larger sample is needed to obtain more reliable conclusions. Future studies should also investigate the correlation between individual traits and discussed ECG and ICG features. Finally, the inclusion of the P wave should be considered for the analysis.

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IN PURSUIT OF OBJECTIVITY: Physiological Measures as a Means of Emotion Induction Procedure Validation

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Abstract

When assessing emotional states, psychologists often rely on self-report measures and questionnaires, and the results of these may be susceptible to manipulation. An approach combining physiological measures with commonly used psychological methods may provide a solution to this issue. Thus, we combined several physiological parameters with self-report measures to assess the effectiveness of a newly constructed anger-induction procedure based on the guided fantasy technique. Fifty-nine healthy participants ($M_{age}=19.92$, fifty females) took part in the experiment in which Electrodermal Activity (EDA), Electrocardiography (ECG), and Impedance Cardiography (ICG) outputs were recorded using BIOPAC Systems equipment. The parameters were recorded during 3 phases: relaxation period; experimental manipulation, in which participants were subjected to anger-evoking audio material; and post-manipulation period. Participants were then asked to rate their emotional experience and aggressive behavioral tendencies that occurred during the anger-inducing guided fantasy. We expected to find significant differences between physiological responses recorded during the baseline and the anger induction phase if the guided fantasy had a genuine effect on the participants' emotional state. Obtained data provides support for such an assumption. The benefits and shortcomings of using physiological parameters in emotion research are discussed.

Keywords: Electrodermal Activity (EDA); Electrocardiography (ECG); Impedance Cardiography (ICG); Emotion induction; Anger Induction

Introduction

Surveys and self-report questionnaires are some of the most commonly used research tools in psychology, however, they are susceptible to intended or even unintended subject manipulation (Ciuk, Troy, & Jones, 2015). There

has been a growing interest in the use of physiological measures for the purpose of validating the traditional psychological research of human emotions (Peterson et al., 2015). Various methods of experimental induction of emotions have been developed over the years for the purpose of exploring their influence on other psychological variables. However, these methods differ in their effectiveness (Siedlecka & Denson, 2019). In particular, newly designed procedures require evidence of their effectiveness before researchers may embrace them for evoking specific emotions.

Therefore, the aim of this study was to assess the effectiveness of a newly constructed anger-inducing procedure using the guided fantasy technique. This was done by combining physiological measures with self-report measures. The purpose of this was to provide evidence that this anger-inducing procedure evokes physiological responses commonly related to anger states. Inducing anger in an artificial setting has been shown to correlate with an increase in heart rate and systolic blood pressure (Lobbestael, Arntz & Wiers, 2008; Pedersen et al., 2011), cardiac output (Mauss, Cook, Chang & Gross, 2007), and electrodermal activity (Marci et al., 2007). In accordance with these findings, Electrocardiography measures (ECG), Impedance Cardiography measures (ICG), and Electrodermal Activity (EDA) were recorded in the present study.

Method

Sample

The sample consisted of 59 healthy undergraduate psychology students ($M_{age}=19.92$; age range 19-21; fifty females) who received extra course credit for their

participation in the study. The study was approved by the ethical committee and all participants had signed an informed consent before the experiment. After completing the study, participants were given a detailed debriefing.

Experimental procedure

The experiment was conducted on an individual basis. Physiological signals were recorded using BIOPAC Systems equipment. The experimental procedure consisted of three phases of recording, each of which lasted 2 minutes: baseline, anger induction, and post-induction. During the baseline and the post-induction period, participants were instructed to sit calmly, relax, and optionally close their eyes. The post-induction phase was recorded to capture any potential changes in participants' physiological responses that may occur as a result of calming down. During the anger induction phase, participants were instructed to listen to the audio-guided fantasy that was supposed to elicit anger and imagine what would the situation described feel like. The content of the audio material was selected and pre-tested in the pilot study. The audio narrative describes a situation to which participants can relate to: they need to complete a group assignment to pass an exam while confronting irresponsible colleague who passed their part of the work onto them. After the recording, participants assessed the emotions experienced during the anger-induction phase.

Physiological and self-report measures

Electrodermal Activity (EDA). This is a noninvasive measure of the changes in the resistance of skin observed due to administration of small electrical current (Critchley & Nagai, 2013). Emotional arousal is known to affect the sweat gland activity, and thus can be registered by measuring skin conductance (Caruelle, Gustafsson, Shams & Lervik-Olsen, 2019). The measures included in the analyses were: Average tonic EDA, SD of EDA, Median of tonic EDA, and Number of peaks.

Electrocardiography (ECG). This is a noninvasive measure of how the electrical activity of the heart changes over time as action potentials propagate throughout the heart during each cardiac cycle (Dupre et al., 2005). The changes in the ECG signal can also reflect emotional arousal (Selvaraj, Murugappan, Wan & Yaacob, 2013). The measures that were analyzed were: RR-NN intervals, Heart rate (HR), RMS for successive R-R differences, etc.

Impedance Cardiography (ICG). This is a noninvasive measure of total electrical conductivity of the thorax and its changes in time (Yancy & Abraham, 2003); several cardiodynamic parameters are processed: Stroke Volume (SV), Heart Rate (HR), Cardiac Output (CO), Ventricular

Ejection Time (VET), Pre-ejection Period (PEP), Systolic Time Ratio (STR).

Self-report measures. Participants indicated on a seven-point Likert scale the extent to which they felt each of six emotions (anger, happiness, sadness, disgust, surprise, and fear) and three behavioral tendencies (to yell, punch the colleague or put him in his place) during the anger-induction phase.

Results

Repeated measures ANOVA was conducted to test the differences in physiological measures between three recording phases. Significant changes were found only between the baseline period and the anger-induction phase on four physiological measures. The values of average tonic EDA, as well as the average heart rate had increased during the anger-induction phase ($F(2, 104) = 28.48, p < 0.001$; $F(2, 114) = 4.64, p < 0.05$). Conversely, a significant decrease was found for the average PEP ($F(2, 114) = 5.90, p < 0.01$) and STR ($F(2, 114) = 6.70, p < 0.01$). Out of these four measures, only the average tonic EDA retained the same values during the post-induction phase, whereas the other three measures shifted back to their respective baseline values. Furthermore, the self-report measure of anger did not correlate significantly with any of these four parameters. This was true regardless of whether each physiological measure was taken as a difference between the induction phase and the baseline (Table 1) or as average values recorded solely during the induction phase (Table 2).

Table 1
Correlations between self-reported anger and significant physiological measures calculated as a difference between the induction phase and baseline

	Tonic EDA (μ S)	Heart Rate (bpm/s)	Pre-Ejection Period (ms)	Systolic Time Ratio
Self-reported anger	.01	.03	.05	.004

*Note. * $p < .05$. ** $p < .01$*

Table 2
Correlations between self-reported anger and average physiological measures during anger-induction phase

	Tonic EDA (μ S)	Heart Rate (bpm/s)	Pre-Ejection Period (ms)	Systolic Time Ratio
Self-reported anger	-.14	.02	-.26	.02

*Note. * $p < .05$. ** $p < .01$*

Discussion

Some physiological measures were significantly altered during the exposition of participants to anger-evoking audio material. HR and average tonic EDA were increased, while the blood pumping was sped up (as indicated by the shortened PEP and STR). Such responses are expected in a person experiencing rage (Ekman et al., 1983; Marci et al., 2007; Pedersen et al., 2011). However, the absence of significant correlations between the self-report and the physiological measures questions whether the subjects had genuinely experienced anger. One possible explanation of this result could be that the subjects experienced anger to such a mild extent that they did not consciously acknowledge it. Another explanation is that the guided fantasy technique conducted in an artificial setting truly did not induce any anger. If the latter is the case, the observed physiological effect may actually present a consequence of cognitive engagement rather than rage. To test that premise, we repeated the experiment with the addition of an emotionally-neutral recording phase that would cognitively engage the subjects but should not evoke any particular emotions. The data from the second experiment is yet to be analyzed.

Conclusion

Due to its explorative nature, this study provides very limited conclusions and further research is needed. Nevertheless, the obtained results indicate which physiological measures might be sensitive enough to capture the biological changes in response to emotional stimuli and thus serve as useful guidelines for future studies.

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Interoceptive Awareness and Mindfulness: Construct Overlap and Contribution to Well-being

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Abstract

During the last decades, there has been an increasing interest in the constructs of mindfulness and interoceptive awareness (IA) in general, and their contribution to personal well-being in particular. In the current study, we aimed to conceptually replicate the study of Hanley et al. (2017) that found a partial overlap between mindfulness and IA as well as their independent contribution to well-being. The current study, performed on a sample of 470 participants ($M_{age}=19.03$, 66% females), was equal to Hanley et al.'s with respect to the IA model, but differed in the choice of mindfulness and well-being models. The main results were replicated: IA and mindfulness had only a partial overlap (lower than in the original study) and they had an independent contribution in predicting personal well-being (though total variance explained was also lower than in the original study). Results imply that focusing on the present moment seems to be beneficial for personal well-being, especially if it includes signals from within one's body. However, regulatory processes might be more important than simply being aware of sensations or emotions. Due to the complexity of key constructs and related difficulties in measuring them, more research is needed to provide precise insights.

Keywords: Multidimensional Assessment of Interoceptive Awareness (MAIA), mindfulness, Mindful Attention Awareness Scale (MAAS), well-being, Subjective Happiness Scale (SHS)

Introduction

Rooted in the Eastern tradition, mindfulness and body/interoceptive awareness (IA) have become popular constructs in the Western cultures and scientific studies oriented towards a better understanding of adaptive forms of behavior and variables contributing to well-being (Hanley et al., 2017).

IA and mindfulness are expected to partially overlap since both capture psychological processes related to attention and self-reflection: IA is defined as the conscious level of interoception (sensing, interpreting and integrating signals from the body) (Mehling et al., 2012), while mindfulness refers to focusing attention on experience in the present moment in a nonjudgmental way (Brown & Ryan, 2003).

IA and mindfulness are also distinct: mindfulness does not distinguish between attention directed to exteroception, interoception or thoughts, while IA only

focuses on somatic experiences but does not distinguish between different, for example mindful vs. anxiety-driven attention styles regarding internal stimuli.

Both IA and mindfulness are expected to contribute to well-being, which has already been tested in the study of Hanley et al. (2017): a partial overlap between IA and mindfulness has been revealed, but also their independent contribution to personal well-being. However, since all these phenomena (i.e. well-being, mindfulness, and IA) are complex, without unique definitions and measurements, the authors themselves acknowledged that their results are limited to the specific understanding and operationalization of constructs. Therefore, in the current study, we aimed to conceptually replicate the study of Hanley et al. (2017) by employing the same model of interoceptive awareness (as one of the rare theoretically based and empirically supported models of IA), but different models of well-being and mindfulness (as both of these constructs are captured differently in competitive models). This way, we could examine whether the general pattern of results remains the same, even with different models and operationalizations of key constructs.

While well-being is understood sometimes through more cognitive parameters (e.g. The Satisfaction With Life Scale, SWLS, Diener et al., 1985), and sometimes through more emotional aspects (e.g. Positive and Negative Affect Schedule, PANAS; Watson, Clark, & Tellegen, 1988.), the current study was based on one specific approach that considers subjective happiness as a personal state which is presumed to be relatively stable in time and relatively independent on external factors (Lyubomirsky & Lepper, 1999). The Hanley et al. (2017) study treated psychological well-being in more complex terms, so that six dimensions were assessed: self-acceptance, purpose in life, environmental mastery, positive relationships, personal growth, and autonomy (according to the model of Ryff, 1989).

Similarly, the construct of mindfulness can be understood in different ways. The current study is based on a model that treats mindfulness as one core trait dimension related to a receptive state of mind – simple observation of what is going on in the present moment, without evaluations, memories, beliefs, or any kind of

cognitive appraisals (Brown & Ryan, 2003). In contrast, the Hanley et al. (2017) study employed a more complex model of mindfulness that proposes five facets: observing, describing, acting with awareness, non-reacting, not-judging (Baer et al, 2006).

Given these methodological differences, we expected to replicate the main findings regarding both the partial overlap as well as significant independent contributions of IA and mindfulness to well-being. On the other hand, we assumed that the total variance explained in the model might be smaller compared to the study being replicated, given that both IA and mindfulness models were unidimensional in the current study and multidimensional in the previous one. Namely, in general, multidimensional models are presumed to capture a wider range of processes compared to the unidimensional models, which are by definition focused on one specific dimension.

Method

Participants and procedure

Participants in our study were 470 students of the Faculty of Organizational Sciences, University of Belgrade ($M_{age} = 19.03$, 66% females). They all gave informed consent and completed the instruments in exchange for course credit.

Instruments

Multidimensional Assessment of Interoceptive Awareness (MAIA) is 32-item instrument assessing self-perceived body awareness in daily life (Mehling et al., 2012). Responses are given on a 6-point scale (0 - never to 5 - always). MAIA has eight subscales: Noticing, Not-Distracting, Not-Worrying, Attention Regulation, Emotional Awareness, Self-Regulation, Body Listening, Trusting. The reliabilities of the subscales were shown to be satisfactory - from $\alpha = .66$ for Not-Distracting to $.87$ for Attention regulation. MAIA has been officially translated into 20 languages, and for the purpose of the current study, we employed the Serbian version of MAIA ("Multidimensional Assessment of Interoceptive Awareness", 2020).

The trait Mindful Attention Awareness Scale (MAAS) is a unidimensional 15-item instrument, reported to have high internal consistency ($\alpha = .92$; Brown & Ryan, 2003). Responses are given on a 6-point scale (1 – almost never, 6 – almost always). For the purpose of the current study, we translated (and back-translated) the instrument into Serbian.

Subjective happiness scale (SHS) is comprised of 4 items (Lyubomirsky & Lepper, 1999). Responses are given on a 7-point Likert scale. The instrument had already been translated and validated in a Serbian sample and reported to have good internal consistency ($\alpha = .83$; Jovanovic, 2014).

Results

Our data did not show a substantial overlap between IA and mindfulness. Mindfulness had low positive correlations with Not-Distracting, Attention Regulation, Self-Regulation, and Trusting, but not with other MAIA subscales.

Table 1: Descriptive statistics, reliability, and correlations between MAIA dimensions, MASS, and SHS

	<i>M (SD)</i>	α	MASS	SHS
Noticing	3.39 (0.84)	.55	-.05	.07
Not-Distracting	2.21 (0.90)	.41	.26**	.12*
Not-Worrying	2.22 (0.96)	.52	.03	.00
Attention Regulation	2.88 (0.80)	.79	.10*	.16**
Emotional Awareness	3.61 (0.91)	.75	-.02	.10*
Self-Regulation	2.58 (1.03)	.77	.12**	.32**
Body Listening	2.48 (0.97)	.55	.03	.15**
Trusting	3.59 (0.92)	.69	.19**	.37**
MASS	3.85 (0.78)	.83		.33**
SHS	4.99 (1.24)	.83		

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

Enter method regression analyses (with MAIA in the first and MAAS in the second block and the other way around) explained a total of $R^2 = .25$ variance of well-being. Importantly, both constructs had an independent contribution to predicting well-being (R^2 change = .15 for MAIA after MAAS; R^2 change = .04 for MASS after MAIA; both $p < .001$).

Table 2: Regression coefficients for predicting well-being

	β	<i>p</i>
Noticing	-.024	.656
Not-Distracting	.092	.036
Not-Worrying	-.017	.694
Attention Regulation	-.155	.011
Emotional Awareness	.001	.985
Self-Regulation	.266	.000
Body Listening	-.007	.898
Trusting	.302	.000
MASS	.228	.000

Discussion and conclusion

In line with the Hanley et al. (2017) study, our results showed that mindfulness and IA appear to be largely independent constructs, as evidenced by both their low to nonexistent correlations as well as their independent contributions to well-being. Focusing attention on both the present moment and signals from one's body (with

particular significance of regulatory processes) seems to be relevant for personal well-being.

As expected, while Hanley et al. (2017) study found that the total mindfulness score was positively correlated $>.30$ to seven out of eight MAIA dimensions (and $>.40$ for three of them), while some mindfulness dimensions were correlated $>.50$ with some MAIA dimensions, the unidimensional mindfulness operationalization used in our study showed a lower overlap with IA. Similarly, the overall percentage of variance of unidimensional well-being explained by mindfulness and interoceptive awareness was lower in our study compared to Hanley et al. (2017) ($R^2 = .49$).

Interestingly, the significant MAIA predictors of well-being in our study were precisely those four subscales which correlated with mindfulness as well. In the Hanley et al. (2017) study, Attention Regulation and Trusting were the only significant MAIA predictors of psychological well-being.

As for other methodological aspects that could have led to differences in the obtained results, it should be noted that MAIA subscale reliabilities in our study were lower than reported in the original study (Mehling et al. 2012), potentially attenuating the strength of correlations with other constructs. Also, the participants in the Hanley et al. (2017) study were American adults ($N = 246$; 57% females, $M_{age} = 36.44$), recruited from Amazon's crowdsourcing website Mechanical Turk (MTurk), while our participants were a more homogeneous group – students.

To conclude, despite the general pattern of results successfully replicating, results seem to vary depending on the model/operationalization of key constructs (i.e. mindfulness, interoceptive awareness, well-being) used. Therefore, like the authors of former study, we also limit

our results regarding mindfulness and IA contributions to well-being to constructs and related methods applied in our study.

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Addressing Issues in Scoring Ability Emotional Intelligence Tests: A Comparison of Two Methods for Obtaining Consensus Scores on the MSCEIT

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Abstract

The leading measure of ability emotional intelligence (EI)—the MSCEIT—uses proportion consensus scoring (PCS), meaning that each response is scored from 0 to 1 depending on the proportion of the normative sample endorsing that response. Issues pertinent to this approach are often debated, yet alternative scoring methods have received limited research attention. The present study represents a first attempt to apply mode consensus scoring (MCS) to rate performance on the MSCEIT scales of Understanding Emotions (UE) and Managing Emotions (ME). Participants were 255 employed adults who completed: a) the UE and ME tasks of the MSCEIT; b) three standard intelligence tests yielding a *g*-factor; c) a personality inventory assessing the Big Five; and d) a scale of psychological well-being. The MSCEIT data were scored twice, using PCS and MCS keys. Both scorings resulted in satisfactory distributional properties, with MCS producing superior distributional symmetry. Split-halves were .66–.78 with PCS, and .52–.72 with MCS. In both cases, UE and ME had statistically significant, small to moderate correlations with the *g*-factor, and showed the same pattern and similar magnitude of correlations with the Big Five (negative with Neuroticism and positive with other traits). With PCS, UE and ME predicted 24% of the well-being variance, while with MCS, this portion was 16%. Overall, both scoring methods resulted in similar psychometric properties for the MSCEIT scales in question, thus supporting further work on the evaluation of the most appropriate scoring format for ability EI tests.

Keywords: ability emotional intelligence; MSCEIT; consensus scoring; proportion; mode

Introduction

Emotional intelligence (EI) involves reasoning about emotions and the ability to use emotions and emotional knowledge as input for emotional processes (Mayer, Roberts, & Barsade, 2008).

Based on the Four-Branch Model (Mayer & Salovey, 1997), EI comprises four hierarchically organized dimensions: perceiving emotions, using emotions, understanding emotions, and managing emotions. These abilities are most accurately assessed using maximum-performance measures as in cognitive assessment in general. Currently, only one among available EI tests—the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey, & Caruso, 2002)—covers all EI dimensions.

Scoring of Ability EI Measures

Scoring has been one of the key challenges in devising ability EI measures: Objectively correct answers for questions involving emotional content are often hard to determine, which is why it is difficult to apply truly veridical criteria in scoring EI tasks (Roberts, Zeidner, & Matthews, 2001).

To discriminate correct from incorrect answers on EI tests, researchers have introduced three alternative scoring procedures (Mayer, Caruso, & Salovey, 1999): consensus, expert, and target scoring. Consensus scoring is an attractive and the most frequently used procedure when traditional methods do not provide clear-cut answers (Barchard & Russell, 2006). It is also a scoring choice for the MSCEIT.

In consensus scoring, the correct answer is that which is endorsed by the majority of a particular group. The rationale behind this scoring procedure is that judgments pooled within a large normative sample can serve to determine reliable score weights (Legree, 1995). Some concerns regarding this scoring pertain to the validity of consensus judgments that cross gender and cultures (Matthews, Zeidner, & Roberts, 2004). However, the catch-22 for consensus scoring is that test scores cannot be both reliable and normally distributed (MacCann, Roberts, Matthews, & Zeidner, 2004): High internal consistency assumes that the majority endorses the best alternative, creating a highly peaked cluster at the top end of the distribution. As a result, consensus scores fail to meet multivariate normality assumptions and discriminate average from high EI.

Among different consensus scoring methods, proportion and mode scores have been most widely used. Both have proven psychometrically promising by resulting in unidimensional scores and demonstrating convergent validity (MacCann et al., 2004). In proportion consensus scoring (PCS) a score is assigned to each response corresponding to the proportion of the standardization sample endorsing that response (e.g., if 65% of people choose a certain response, then that response is awarded a score of 0.65). Within mode consensus scoring (MCS) the most frequent response is scored as 1, while all other responses receive 0 points.

Current Study

Thus far, only several studies compared the properties of different consensus scoring methods for ability EI tests (see Barchad & Russell, 2006; MacCann et al., 2004). Their findings imply that PCS faces problems with discriminability, while MCS suffers from lower reliability (MacCann et al., 2004). Yet, these findings are of limited significance since they were obtained only for the lower-order branch of Perceiving Emotions. The purpose of the current study was to address these limitations by comparing the distributional properties, reliability, and validity of PCS and MCS on the two higher-order EI branches, i.e., the MSCEIT scales of Understanding Emotions (UE) and Managing Emotions (ME).

Method

Sample and Procedure

Participants in the study were 255 working adults (115 female, $M_{\text{age}} = 40.08$; $SD_{\text{age}} = 8.24$) from the larger Belgrade area. Data were collected on company premises, during regular working hours.

Measures

Ability EI. The Serbian MSCEIT (Altaras Dimitrijević & Jolić Marjanović, 2010) was used to assess UE and ME. Raw data were scored in two ways, using the proportion and mode scoring keys.

Intelligence. Three intelligence tests were used to obtain a g-factor of standard “academic” abilities: Raven’s Progressive Matrices, Verbal Analogies, and General Information.

Personality. The NEO Five Factor Inventory (McCrae & Costa, 2004) was used to measure the basic personality domains of Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness.

Psychological well-being (PWB). This construct was assessed with Ryff’s Scales of Psychological Well-Being (Ryff & Keyes, 1995).

Results

Table 1 presents findings on the distributional properties of scores obtained via two different scoring methods.

Table 1: Descriptive statistics and internal consistencies for scores obtained using PCS and MCS.

Scoring method	EI	Min-Max	$M (SD)$	Mdn	$S-B$	Sk	Ku	KST
PCS	UE	.18-.62	.43 (.08)	.44	.67	-.46	.36	.69
	ME	.14-.48	.30 (.07)	.30	.77	.21	-.45	.89
	EI	.20-.51	.37 (.06)	.37	.78	-.23	-.07	.57
MCS	UE	.18-.87	.54 (.12)	.54	.58	-.17	-.07	.69
	ME	.23-.95	.69 (.13)	.71	.71	-.55	.27	1.42*
	EI	.26-.86	.62 (.10)	.62	.72	-.40	.27	.60

Notes. PCS—proportion consensus scoring; MCS—mode consensus scoring; UE—Understanding Emotions; ME—Managing Emotions; EI—global EI score; S-B—Split-half coefficients; KST—Kolmogorov-Smirnov Test.

Correlations of proportion and mode MSCEIT scores with intelligence and personality are shown in Table 2.

In linear regression analyses, proportion UE and ME scores predicted 24% ($F_{(2, 240)} = 39.33, p < .001$), while mode scores predicted 16% of the variance ($F_{(2, 240)} = 23.77, p < .001$) in PWB.

Table 2: Correlations of scores obtained using PCS and MCS with g-factor and Big Five.

Scoring method	EI	g-factor	N	E	O	A	C
PCS	UE	.29**	-.29**	.13*	.09	.07	.17**
	ME	.37**	-.40**	.38**	.36**	.12*	.37**
	EI	.40**	-.42**	.31**	.27**	.12	.33**
MCS	UE	.25**	-.29**	.14*	.06	.08	.18**
	ME	.30**	-.36**	.32**	.26**	.15*	.29**
	EI	.34**	-.41**	.29**	.21*	.15*	.29**

Notes. PCS—proportion consensus scoring; MCS—mode consensus scoring; UE—Understanding Emotions; ME—Managing Emotions; EI—global EI score; N—Neuroticism; E—Extraversion; O—Openness; A—Agreeableness; C—Conscientiousness.

Discussion and Conclusions

The purpose of the current study was to offer additional findings on the distributional properties, reliability, and validity of ability EI scores obtained with different consensus-based scoring methods. Specifically, we sought to compare the results of PCS and MCS of the MSCEIT tasks examining the abilities to understand and manage emotions.

As per distribution, the current data attest to satisfactory properties of scores acquired through both scoring methods. For both types of MSCEIT scores, Skew and Kurtosis values were well below 1, means generally equal to medians, and score ranges large enough to ensure discriminative power. MCS resulted in a considerably larger right tail for both the UE and ME distribution curves, i.e., in some improvement of distribution symmetry. The superiority of MCS with respect to discriminability is in line with previous studies (MacCann et al., 2004), while notably better dispersion towards higher scores implies that the MCS might be more potent in discovering those gifted in ability EI.

Internal consistencies were roughly the same for both types of scores, though overall somewhat higher with PCS. While this is indeed expected, the differences are not large enough to clearly suggest better reliability with PCS.

With respect to convergent validity, correlations with the g-factor were in both cases positive, small to moderate, and statistically significant, upholding ability EI as a distinct type of intelligence. As for discriminant validity, patterns of correlations with the Big Five were the same with PCS and MCS. In both cases, UE and ME were negatively associated with Neuroticism, whilst other significant correlations with personality were positive.

Coefficient sizes significantly varied depending on the trait, clearly differentiating ability EI from personality. Finally, both proportion and mode MSCEIT scores were successful in predicting PWB, with more variance explained when using PCS, in part due to higher internal consistency.

In sum, although both scoring methods resulted in quite similar psychometric properties for UE and ME scores on the MSCEIT, the current findings suggest that they might have different potentials when it comes to identifying highly emotionally intelligent individuals, on the one side, and using EI to predict relevant criteria, on the other. They also encourage a more systematic evaluation of the strengths and weaknesses of different ways of scoring ability EI tests.

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Biosignals: Measurement and Analysis with Applications in Psychology

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Abstract

This paper provides an overview of the measurement and analysis of biosignals for application in psychology. We will tackle the ups and downs of the existing technologies and methodologies to get an insight into the connection between psychology and physiology. A short overview of biosignal properties, especially their vulnerability to artifacts and other challenges related to their analysis and interpretation for emotion assessment will be discussed.

Keywords: biomarker; biomedical engineering; data analysis; electrophysiology; emotion assessment.

What are biosignals?

Biosignals are signals recorded from a living organism. Although biosignals commonly refer to electrophysiological signals (e.g., electroencephalogram, EEG) they, also, represent non-electrical signals (e.g., breathing frequency). (Naït-Ali, 2009)

Why are measurement and analysis of biosignals challenging in comparison to the other signals? Firstly, biosignals are inherently complex as they originate from living organisms and their compound mechanisms. Secondly, biosignals have very small amplitude and unfavorable signal-to-noise ratio (SNR), especially in telehealth applications (Lovell & Redmond, 2010). Consequently, they are sensitive to the artifacts (e.g. power hum, movement, electrode-skin impedance, and other biosignals too). Despite all the issues, biosignals can be very useful for the description of physiological processes. Therefore, they can enhance information if used with standard psychological techniques like self-report, task-performance, and behavioral paradigm.

We present a short overview of biosignals application in psychology with selected benefits and limitations. Our aim is to promote a multi- and inter-disciplinary approach in psychology as an opportunity to create novel insights into human emotions and behavior.

Biosignals for emotion assessment

Measurement and analysis of biosignals can be very useful for comprehensive research of cognitive and emotional processes such as emotions in psychology. While biomedical engineers study biosignals quantitatively and objectively by applying the appropriate instrumentation and dedicated software modules, psychologists investigate emotion as a complex state with cognitive, physiological, and other components by designing protocols and interpreting results. For the successful study design, its conduction, and appropriate interpretation of the results, a tight collaboration between biomedical engineers and psychologists is highly desirable (and should be encouraged to a greater extent). Engineers are skilled in signal processing and extraction of relevant features, while psychologists are versed in experiment design and results interpretation.

The connection between the complex representation of emotion and quantitative measure is the activity of the autonomic nervous system (ANS). There are three branches within ANS: the sympathetic nervous system (SNS), parasympathetic nervous system (PNS), and the enteric nervous system (ENS). SNS is responsible for the “fight or flight” response: it speeds up the heart, breathing, dilates the pupils; overall it prepares all body resources to cope with the environment. PNS accelerates the work of the immune system and digestion while decelerates the work of the heart. Also, PNS enables unhindered internal human body regulation. SNS and PNS have inhibitory effects on each other. ENS controls the function of gastrointestinal tract, and can work independently from SNS and PNS, even though ENS can be influenced by them. (Jänig, 2008)

SNS and PNS functioning are very important, as assessment of physiological reactions provides an insight into organism arousal which helps us to indirectly assess human emotions. To some extent, this approach

complements the self-assessment questionnaires, verbal and non-verbal communication, and behavior analysis commonly used in psychology. Measurement of physiological signals can enrich standard methodology in psychology as it is not subject to manipulation by the respondents; it does not rely on the assessment of observers and can be applied in subjects where investigation cannot rely on introspection such as children and animals. We present sample biosignals that can be used in psychological research.

Electrodermal Activity (EDA)

EDA is also known as the psychogalvanic reaction or galvanic skin response and it is one of the most widely used measures in psychophysiology (Cacioppo et al., 2007). This measure relies on the fact that the skin conductivity changes when SNS activity is increased. Hence, EDA is a suitable indirect measure of excitement. Moreover, the immediate response is capable of providing instantaneous insight into signal changes for biofeedback applications. The disadvantage of EDA is that it is subject to noise and many factors must be taken into account such as whether to use dry or wet electrodes, how to clean electrodes, how to account for movement artifact, etc. Sample placement of EDA electrodes is presented in Figure 1.

Carolus and associates (2017) from Kaspersky Lab conducted an interesting study where EDA and thermal activity were measured to assess emotional response to the loss of data from the computer. They reported that in a situation where the loss of data was simulated, they managed to measure the grief as well as that the grief was the greatest in the loss of personal data. Although we can challenge the assumption that the measured response corresponds to the grief solely, as it might be a result of shock, horror, and excitement, this is a good example of the biosignals application for quantitative assessment of emotional reaction.

This study also included an interesting remote measurement of facial temperature distribution performed by a thermal camera. A sample facial thermogram is presented in Figure 2.

Electromyogram (EMG)

EMG is a measure of the electrical activity of skeletal muscles and can be used in emotion assessment studies. When surface Ag/AgCl (silver/silver chloride) electrodes are placed over the skin covering the muscle belly of facial muscles according to the SENIAM protocol (Hermens et al., 1999), we can gain an insight into the electrical muscle activity in a response to emotion (e.g., anger or fear). Despite its attractive feature to study muscular activation of facial expressions, EMG can be affected by external and internal sources of noise including movement artifacts, skin-electrode impedance

power hum, cross-talk (EMG signal originating from non-targeted muscles), etc. (Cacioppo et al., 2007)

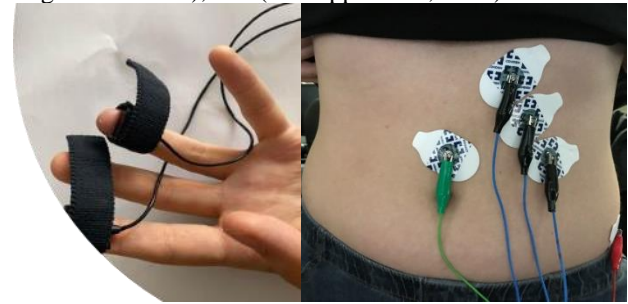


Figure 1: Placement of electrodes for EDA measurement from (Miljković & Dubljević, 2020) on the left-hand panel and for EGG measurements for three-channel configuration as recommended in (Popović et al., 2019) on the right-hand panel. The photographs were taken at the LIRA, Faculty of Philosophy, University of Belgrade, and at the University of Belgrade – School of Electrical Engineering.

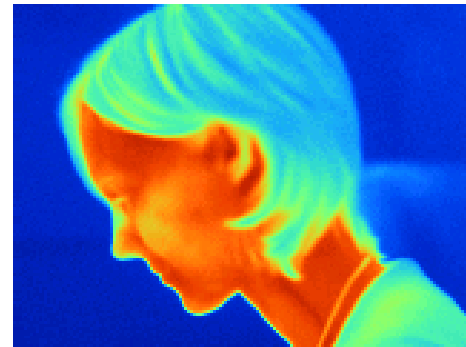


Figure 2: Thermography by highlander411 from Flickr <https://www.flickr.com/photos/highlander411/1764226014/>; CC BY 2.0 Generic

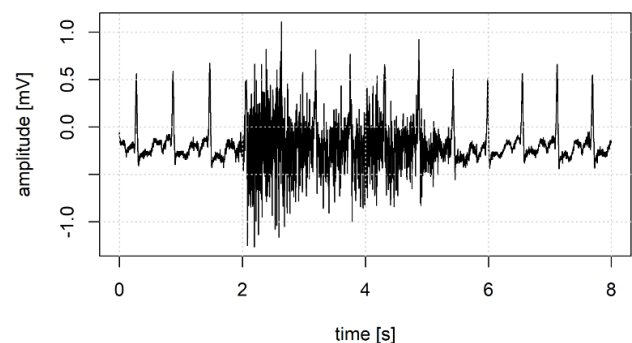


Figure 3: EMG with ECG noise recorded from *Pectoralis* muscle. Image is taken from (Miljković, 2018).

EMG can be also affected by other biosignals that are not part of the signal of interest such as the electrocardiogram (ECG). Sample EMG signal from *Pectoralis* muscle with ECG noise is presented in Figure 3 with recognizable heartbeats (Miljković, 2018). With careful protocol design, and precautions in conducting measurement

procedure and biosignal processing, one can ensure appropriate signal quality (Cacioppo et al., 2007).

Electrogastrogram (EGG)

EGG is a non-invasive measure of gastric electrical activity and can be used for a wide range of applications including assessment of stress and anxiety. It has been suggested that when additional energy is needed for “flight or fight”, the gastrointestinal system either slows down or shuts down completely. Due to the small amplitude ranging from 200 μ V to 500 μ V, researchers usually record from two or more abdominal sites to select the most artifact-free channel. A visual inspection of the signals is usually applied prior to their processing, which is mostly conveyed/conducted in the frequency domain. (Cacioppo et al., 2007)

Instead of a conclusion

Although there are many benefits from applying biosignals in psychology research for assessment of a person’s state, careful protocol design and proper measurement procedures are a prerequisite for successful application of biosignal analysis methods and extraction of relevant features which calls for integrated action from both psychologists and biomedical engineers.

Beside the emotion detection, there are other applications, such as behavior monitoring, studying of the individual differences, arousal assessment, biofeedback, etc.

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Disintegration and Apophenia

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Abstract

Literature suggests that apophenic tendencies might be related to the Disintegration trait. Our hypothesis is that the aforementioned finding will appear in this study as well. We introduce two new approaches for measuring Apophenia, precisely, a test of Subjective perception of randomness (SPR) and the Inventory of everyday biases (IEB), and aim to examine whether the correlation between Disintegration and apophenic tendencies would be found in these modified conditions. Disintegration trait was assessed using 120 items DELTA questionnaire. SPR test consisted of two tasks - one with coins and one with flags, both based on Kahneman and Tversky's research on perception of randomness and heuristics. IEB questionnaire had two types of items, each of them representing a specific reality or imaginary context. A significant correlation was found between the total score on Disintegration and the reality situations in IEB. Two SPR tasks correlated significantly. Disintegration, as well as IEB, did not correlate with SPR tasks. We discuss the theoretical and methodological aspects of the study that might influence results.

Keywords: Disintegration; apophenia; cognitive biases; self-report methods and experimental tasks

Introduction

Disintegration is defined as a personality trait that indicates proneness to psychotic-like experiences, including maladaptive, inconsistent and unbalanced behavior, emotions and cognition (Knežević et al, 2017).

Apophenia is a tendency to perceive meaningful patterns, regularities, or connections in unconnected events or stimuli (Conrad, 1958, as cited in Ellerby & Tunney, 2017). Some authors argue apophenia not only refers to recognizing these patterns but may also be integrated into probability understanding (e.g., Goodnow & Postman, 1955; Jarvik, 1951). Certain evidence suggest apophenic patterns of perception and cognition could be related to psychosis (Blain et al., 2020).

Some claim psychosis-proneness could be reduced to Openness to experience (O) in the Big Five and HEXACO models of personality (e.g., DeYoung et al., 2012). However, the relation between Apophenia and O hasn't been consistent within data (see Knežević et al., 2016). This raises the question whether standard personality models should be expanded with an additional disposition that would explain these findings. Knežević et al. (2017) proposed that this trait could be Disintegration and that it could be a basis of apophenic tendencies.

In this study, two tests mapping Apophenia were created, a test of Subjective perception of randomness (SPR) and an Inventory of everyday biases (IEB), representing new approaches for measuring Apophenia. This study aims to examine if the correlation between Disintegration and apophenic tendencies will arise in these modified conditions. Conditions in SPR test reflect principle used in measuring Apophenia in previous operationalizations (Kahneman and Tversky, 1972), but in one task the context differed from the ones formerly used. IEB had behavioral items and was constructed as a possible way of measuring Apophenia in more realistic scenarios, since this method was not used in past research for these purposes.

Method

Sample

A total of 198 (59% females) high school students participated in the study, aged from 15 to 20 ($M = 18$, $SD = .98$).

Instruments

Participants were given three instruments: DELTA-9, as well as two tests for measuring Apophenia - SPR and IEB, which can be found on the [OSF platform](#).

Disintegration (DELTA-9). Disintegration trait was measured with a 120-item DELTA-9 ($\alpha = .90$) questionnaire (Knežević et al., 2017). Seven-point Likert scale was used, whereby 1 stood for complete disagreement and 7 for complete agreement. Lower scores indicate lower proneness to Disintegration.

Subjective perception of Randomness (SPR). SPR test ($\alpha = .89$) was constructed to measure apophenic tendencies in observed sequences. It consisted of two tasks, both following principles of randomness. The first task was based on Kahneman and Tversky's methodological approach (1972) and stimuli were sequences of coins. The second task included pictures of flags of the countries competing in ski jumping. One item constituted seven jumps. Each jump had a circled flag, and the respondents estimated their randomness. Examples of test items can be found in Appendix 1.

The software [Random generator](#) formed a long sequence of numbers, ranging 1-2 (coins) i.e., 1-5 (flags), that came from the white noise. Afterward, the sequence was divided into 16 equal parts, which represented items in tasks. Each number was assigned a picture that

symbolized head/tails in the first task or five competing countries in the latter.

Respondents were expected to evaluate the level of randomness of a given sequence. Seven-point Likert scale was used in both tasks, whereby 1 meant complete randomization, while 7 meant complete determination. Lower scores suggest less apophenic propensity.

Inventory of everyday biases (IEB). IEB test ($\alpha = .65$) was constructed to measure apophenic tendencies in everyday situations and was composed of behavioral items. The authors created five reality and two imagination items. Reality items alluded to possible everyday experiences. Imagination items referred to hypothetical gambling situations. Examples are given in Appendix 2. On reality items, participants gave their answers in terms of percentage. Lower percentages imply less apophenic tendencies. On imagination items, participants had to choose the amount of money they would bet in specific conditions items implied. Lower amounts indicate less apophenic tendencies

Table 1. Descriptive statistics

	Min	Max	M	SD	zSk	zKu
SPR_coins	16	112	58.10	18.73	-2.22*	1.47
SPR_flags	16	112	63.16	19.63	0.79	1.68
DELTA-9	335	703	492.57	71.85	0.22	-0.22
IEB_RF	7	500	230.68	106.78	-1.08	-0.69
IEB_FI	0	10000	2397.09	2658.45	6.60**	2.11*

Procedure

All data was collected online, via Total Assessment platform. Completion took about 30 minutes.

Results

For the factor analysis, on IEB, Principal Component Analysis was used and Oblimin rotation was performed. Two-factorial solution was adopted following the Pattern matrix: Reality Factor (RF) and Factor of Imagination (FI), which accounted for 55.80% of the total variance.

Descriptive parameters are shown in Table 1. Negative Sk in coin task indicates higher apophenic proneness than a normal distribution assumes, meaning respondents more often perceived sequences as highly determined. In the task with flags, respondents' answers do not significantly deviate from the normal distribution, indicating less

arousal of apophenic tendencies. On RF respondents' answers were closer to the normal distribution, while on FI answers grouped around lower scale values. Thus, they weren't willing to put high amounts of betting money.

Correlations are shown in Table 2. Two significant correlations emerged - between tasks within SPR, $r(196) = .25, p < .01$, and between DELTA-9 and RF of IEB, $r(196) = .26, p < .05$. Other established correlations were not significant.

Table 2. Correlations among tests

	DELTA-9	SPR_coi ns	SPR_flag s	IEB_RF F
DELTA-9				
SPR_coins	0.07			
SPR_flags	0.00	0.25**		
IEB_RF	0.26*	-0.01	0.06	
IEB_FI	-0.01	0.06	-0.03	0.12

Discussion & Conclusion

Literature proposes that the Disintegration trait should correlate with apophenic proneness. Based on said literature, we hypothesized both IEB and SPR measure the same latent structure, which wasn't proven. SPR tasks didn't correlate with DELTA-9, while only RF of IEB showed significant correlation with the mentioned scale. Lack of a correlation could be explained by the fact that apophenic proneness manifests differently in different tests and tasks. Furthermore, it's plausible that, by using new instruments, we partly measured certain cognitive biases not associated with the Disintegration trait. This assumption stems from the fact that cognitive biases could be present within apophenic tendencies (McCollough, Denmark & Harker, 2014), but there isn't enough evidence confirming correlation between Disintegration and cognitive biases.

The used methodology could be another reason for the lack of a correlation between DELTA-9 and SPR. Namely, DELTA-9, as well as IEB, are self-report measures, while SPR contains experimental tasks. This statement is also supported by the correlation between the RF of IEB and DELTA-9. FI, although self-report measure, correlated neither with DELTA-9 nor RF. The authors suggest this might be due to different situations and instructions items propose. Investing money could also be a relevant factor in participants' way of responding to these items. Mentioned differences could lead to different cognitive processes - FI required imaginative thinking, while RF required remembering past events.

To conclude, findings suggest revision and validation of IEB are needed, given the small number of items. We suggest consideration of another approach to measuring apophenia - self-report measures, that should include items similar to ones in RF of IEB. While previous literature confirms the adequacy of experimental tasks in the examination of this construct (e.g., Peterson & Ulehla, 1965; Rubinstein, 1959), this paper shows self-report measures might also be effective for measuring Apophenia.

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Appendix 1

Task with coins



Task with flags

	Švedska	Norveška	Danska	Finska	Island
Prvi skok					
Drugi skok					
Treći skok					
Četvrti skok					
Peti skok					
Šesti skok					
Sedmi skok					

“

Appendix 2

Reality factor

“Od ukupnog broja puta kada si u žurbi, a pritom svратиš u prodavnicu, u kolikom procentu slučajeva ti se dešava da je baš tada najveća gužva u prodavnici?”

Factor of imagination

„Zamisli da si u kockarnici i da igraš rulet. Četiri puta za redom se palo crno, a nakon toga dva puta crveno. Koliko bi novca (od nula do 5000) uložio/la pri narednom klađenju?”

Effects of violent video stimuli on gastric activity: An electrogastrography-based case study

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Abstract

Electrogastrography (EGG) is a non-invasive technique that can be used for the assessment of gastric myoelectrical activity that further could be beneficial for the assessment of emotionally induced disturbances in the gastrointestinal system. In this paper, we aimed to acquire preliminary insights into its efficacy and performance. This was done by analyzing and comparing EGG recordings obtained in two healthy female subjects during resting and violent video stimulus, both recorded during fasting and postprandial states. Extracted features from the EGG signal included: 1) dominant frequency (DF), 2) median frequency (MF), 3) crest factor (CF), and 4) root mean square (RMS) values. Based on the results it was suggested that novel parameters, especially CF could provide more suitable discrimination between EGG signals for resting and violent video phases. Visual observation suggested that there are detectable alterations in the EGG time-series. The presented preliminary case study should be followed by a future investigation with statistical analysis on a larger sample.

Keywords: electrogastrography (EGG), emotional response, violent video, feature extraction, biofeedback

Introduction

Psychological stressors can have a major effect on physiological processes in the human organism (Notarius & Levenson, 1979; Robinson et al., 2018). These effects can be measured using electrophysiological acquisition systems and subsequently used as biofeedback (Mladenović, 2018). While investigations of electrocardiographic (ECG), respiratory, and electroencephalographic (EEG) signals showed promising results (Jing et al., 2009; Mirmohamadsadeghi et al., 2016; Nie et al., 2011; Xu & Liu, 2009), electrogastrographic (EGG) data are still scarce. Stressful situations are often described as “gut feeling” and it was suggested that gastrointestinal response to emotional states is substantial, which is why EGG could be suitable for the assessment of correlation between psychological stimulus and physiological response (Bennett et al., 1998).

EGG is a method for the acquisition of electrical signals originating from stomach smooth muscles via surface electrodes placed on the skin in the abdominal region of the body (Sanmiguel et al., 1998). Due to its non-invasiveness, it could be suitable for the research of gastric response to various stressors in healthy subjects. Previous studies showed the reliability of non-invasively recorded EGG signal as it correlates with invasively recorded gastric slow-wave activity and provides a reliable estimator of gastrointestinal functionality (Parkman et al., 2003). Although one of its pitfalls is the long duration of recording protocol and complexity of recording setup, recent recommendations suggest that it could be recorded for a shorter period of time using a simplified approach (Popović et al., 2019).

The first results, published in Baldaro et al. (1990), suggested that the frequency content of EGG shifted towards lower values while subjects were watching both neutral and emotional movie sequences. Yin et al. (2004) reported that dominant frequency (DF) decreased as a result of a stressful stimulus (horror movie), and additionally, normal postprandial response was inhibited. In (Radin & Schlitz, 2005) increase in EGG power was determined as a consequence of negative emotions, while Valentina et al. (2018) report that increase of DF was associated with the application of video stimulus. Correlation between EGG alteration and stress during mirror drawing test was found in Homma (2012).

Considering the fact that published results reveal some level of divergence, it is clear that there is a need for more in-depth research to acquire more reliable and valid conclusions. That motivated us to perform a preliminary case-study on two volunteers to examine the effect of Violent Video stimulus (VVS) on EGG signal. Our main aim was to evaluate the efficacy of this method and to provide guidelines for future studies. In addition, novel EGG parameters described in (Popović et al., 2019) were applied for the quantification of the signal, and its effectiveness in the description of stress-induced EGG alterations that were estimated.

Method

Participants

Two healthy female participants were recruited for this study. Demographic characteristics of, both female, subjects ID1 and ID2 were following - age 29 and 23, height 172 cm and 168 cm, weight 64 kg and 56 kg, respectively. Inclusion criteria were the absence of gastrointestinal disorders history, abstinence from solid meal intake for 6 hours, and liquids consumption for 2 hours. Both subjects signed an Informed Consent in compliance with the Code of Ethics of the University of Belgrade, and in accordance with the Declaration of Helsinki.

Recording setup

For the recording of EGG signals, an open-source EGG sensing system presented in (Popović et al., et al., 2019) was used. Placement of 5 Ag/AgCl self-adhesive surface electrodes was done to provide three separate bipolar recording channels as proposed in (Popović et al., 2019). For the display of violent video, a 15-inch monitor was used, with a distance around 50 cm from the participant's eyes. After settling in a comfortable position (from supine to 45° inclination), subjects were asked not to talk or laugh and to limit body movements during the recording protocol. Violent video was created from various sequences of extreme violence from news feeds, available on the Internet. Subjects were informed that they could drop out at any time during the recording session.

Recording protocol

The first session was obtained prior to the test meal (commercially available oatmeal – 274 kcal) and the second one after. EGG signals were recorded in both fasting and postprandial states continuously through the three phases: 1) baseline (5 minutes of resting), 2) violent video (approximately 8 minutes), and 3) post violent video (approximately 5 minutes). A graphical illustration of the recording protocol is presented in Figure 1.

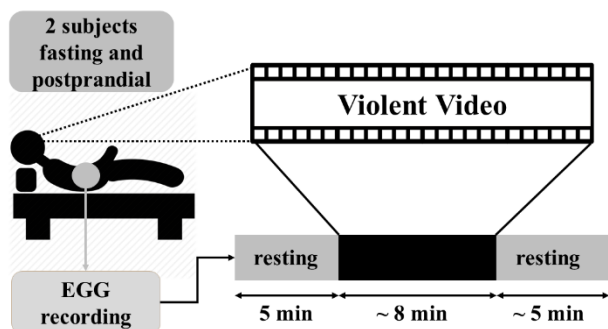


Figure 3: Graphically represented EGG recording protocol.

Signal analysis and feature extraction

EGG signals were preprocessed in GNU Octave (Copyright © 1998-2020 John W. Eaton, CC BY-ND 4.0) by the application of Butterworth 3rd order bandpass filter with cut-off frequencies of 0.03 Hz and 0.25 Hz. Subsequently, EGGs were divided into two segments, the first recorded during the baseline phase and the second during both violent video and post violent video phases. For each segment, the following parameters were extracted: 1) dominant frequency (DF), 2) median frequency (MF), 3) crest factor (CF) of power spectrum density (PSD), and 4) root mean square (RMS) values. DF and MF values in healthy subjects during resting should be in the range from 2 to 4 cycles-per-minute (cpm), while during violent video corresponding values could alter (Popović et al., 2019). RMS represents an estimator of signal power, and it is calculated from following equation:

$$RMS = \sqrt{\frac{1}{n} \sum_{i=1}^n x_i^2}, \quad (1)$$

where x_i are samples of the signal, while n is its length.

CF should provide quantification of peak prominence in EGG signal spectrum (Popović et al., 2019), and it is calculated by applying following equation:

$$CF = \frac{\max(PSD)}{RMS(PSD)}, \quad (2)$$

where $\max(PSD)$ is amplitude of dominant peak in PSD of EGG signal, while $RMS(PSD)$ is its root mean square value.

Results

In this case-study, parameters were acquired for 8 different sequences, out of which four were recorded during baseline and four were recorded during VVS. The increasing trend from baseline to VVS was determined in two out of four DF values, three out of four MF and RMS values, and four out of four CF values. An increase in CF was consistently higher than 15 %.

Table 2: DF, MF, CF, and RMS values calculated for EGG signals recorded in subjects ID1 and ID2. F - R stands for resting sequence during fasting, F - VVS for during and post violent video sequence in fasting state, P - R for resting during postprandial phase, and P - VVS for during and post violent video sequence in postprandial state.

	DF [cpm]	MF [cpm]	CF	RMS [mV]
ID1	F - R	2.11	2.74	0.11
	F - VVS	1.52	3.33	0.19
	P - R	3.04	2.32	0.05
	P - VVS	1.64	2.92	0.12
ID2	F - R	1.99	2.40	0.06
	F - VVS	3.16	4.16	0.13
	P - R	2.69	2.96	0.11
	P - VVS	3.63	3.41	0.11

Discussion

Presented results suggest that novel parameters, especially CF could offer more promising results compared to the commonly calculated DF. This could be the consequence of the expected alteration in PSD of the EGG signals during the VVS stimulus. RMS values in 75 % of cases confirmed an increase in power as reported in (Radin & Schlitz, 2005) which speaks in favor of using this parameter as an alternative for calculation of spectral power.

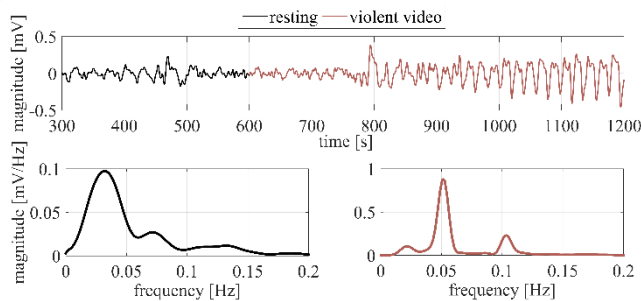


Figure 4: Example of the signal recorded in subject ID 2 during the fasting period (upper panel), with the corresponding PSD for baseline sequence (lower left-hand panel) and violent video sequence (lower right-hand panel).

A better understanding of underlying changes in the EGG time-series and spectrum that lead to alterations in parameters could be obtained from the visual observation. In Figure 2 example of the signal (ID2 fasting) is presented. A gradual increase in the amplitude of the signal after the beginning of the violent video is clear, and as a consequence of this RMS value for VVS EGG was increased. From the PSDs, it is observable that the power increased, and frequency content shifted towards the higher values.

This preliminary investigation showed promising results regarding the assessment of emotionally induced variations in gastric activity by the means of the EGG. Further work should include EGG signals recorded in a larger sample with suitable statistical analysis, to derive more robust conclusions.

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Affectivity of the Dark Side: Descriptors of Affectivity and the Dark Triad

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Abstract

The aim of this study was to examine the relationship of the Dark Triad traits (i.e. Machiavellianism, narcissism and psychopathy) with the positive and negative affective traits and their descriptors. Data was collected online on a total of 880 participants (age: $M = 24.23$, $SD = 6.52$, 176 male) via Short Dark Triad and PANAS scales. Bivariate correlations showed that narcissism was positively correlated with all positive affect descriptors, while Machiavellianism and psychopathy were negatively correlated with only some of them. Psychopathy was positively correlated with most negative affect descriptors, and the other two dark traits only with some of them (narcissism negatively and Machiavellianism positively). Hierarchical multiple regressions showed that positive and negative affect descriptors explained 26.4% of variance for narcissism, 16.8% for psychopathy and 12.3% for Machiavellianism, over and above sex and age. Moreover, dark traits differed in patterns of the predictive values of positive and negative affect descriptors. In sum, obtained results reflect theoretically meaningful relations between the affectivity and Dark Triad, but also highlight affective specificities of each of the Dark Triad traits.

Keywords: personality, Dark Triad, positive and negative affectivity

Introduction

How many different shades of dark does normal personality have and where are they located in personality space? Concept of the Dark Triad of personality was first introduced by Paulhus and Williams (2002), and it encompasses three subclinical malevolent traits: narcissism, Machiavellianism, and psychopathy, which share tendencies toward self-promotion, emotional coldness, duplicity, and aggressiveness. Although empirical overlap between the dark traits has been established, and they show some similar correlates, there are also differences in their relationship with various outcomes (Furnham, Richards, & Paulhus, 2013).

Since the Dark Triad is by definition subclinical (i.e., within the normal functioning), research has examined its location in personality space of normal personality traits. Meta-analysis of the relationship between the Dark Triad and basic personality traits has shown that all three dark traits are negatively related to agreeableness, but also show differential patterns of relationship with other basic traits (Muris, Merckelbach, Otgaar, & Meijer, 2017). Further differences between the Dark Triad emerge from

the perspective focused on facets of the basic traits (Kowalski, Vernon, & Schermer, 2019).

Trait affectivity can be considered as a general proneness to experiencing positive (e.g., feeling enthusiastic, alert or active) or negative (e.g., feeling distress and unpleasurable engagement) emotional states (Watson, Clark, & Tellegen, 1988). Positive and negative affective traits are substantively correlated with some of the basic personality traits, especially neuroticism and extraversion (Watson, Hubbard, & Wiese, 2000), so the question of their relationship with the Dark Triad arises, especially since the Dark Triad is considered to be linked with some affectivity deficits (e.g. Jonason & Krause, 2013). Another related question is the relationship of the Dark Triad with narrower aspects of affective traits. Therefore, the aim of this research was to examine the relationship of the Dark Triad with the affective traits and their descriptors, as perspective focused on facets instead on traits enables further insight into the differences between the dark traits.

Method

Participants

A total of 880 participants (age: $M = 24.23$, $SD = 6.52$, 176 of them male), students of Faculty of Humanities and Social Sciences in Zagreb participated in the research, which was carried out online.

Measures

Dark traits were measured using the *Short Dark Triad* (Jones & Paulhus, 2014; for Croatian version see Wertag, Vrselja, & Tomić, 2011). Cronbach alpha reliabilities were .71, .77, and .72 for narcissism (N), Machiavellianism (M), and psychopathy (P), respectively.

Affective traits were measured using the *PANAS scale* (Watson et al., 1988), and participants were instructed to rate how they feel in general. Cronbach alpha reliabilities were .86 for positive affect (PA), and .88 for negative affect (NA).

Results

Bivariate correlations between the Dark Triad and affectivity are shown in Table 1, and most correlations were small to medium size (i.e., in magnitude between .10 and .30; Cohen, 1988). Narcissism was positively correlated with all positive affect items, while the other two dark traits were negatively correlated with some of

them. Psychopathy had the largest number of relations with negative affectivity, and narcissism, unlike other dark traits, had negative relations with negative affectivity. At the level of total affectivity scales, narcissism was positively related to positive affect and negatively to negative affect, while the opposite pattern was present in case of Machiavellianism and psychopathy.

Table 1: Bivariate correlations of the Dark Triad traits with sex, age, and PA and NA facets

	N	M	P
Male sex	.09**	.22***	.27***
Age	.01	-.16***	-.15***
Positive affect	.41***	-.14***	-.11**
determined	.33***	-.05	-.02
active	.27***	-.14***	-.12***
proud	.38***	-.04	-.07*
strong	.38***	-.09**	-.03
excited	.28***	-.14***	-.07
enthusiastic	.27***	-.14***	-.12***
alert	.22***	-.04	-.01
inspired	.28***	-.09**	-.06
interested	.17***	-.13***	-.11**
attentive	.10**	-.11**	-.12**
Negative affect	-.15***	.14***	.22***
jittery	-.11**	.18***	.19***
upset	-.09*	.13***	.19***
nervous	-.03	.09*	.12***
afraid	-.17***	-.03	.00
guilty	-.02	.06	.13***
scared	-.15***	.03	.11**
irritable	-.04	.13***	.22***
ashamed	-.20***	.01	.10**
distressed	-.20***	.09**	.15***
hostile	.01	.29***	.38***

* $p < .05$. ** $p < .01$. *** $p < .001$

Before performing multiple regression, predictors were checked for multicollinearity, and there was no indication of it (i.e., tolerance values were above .10; Cohen, Cohen, West, & Aiken, 2003). Results of hierarchical multiple regression indicated that variance explained by positive and negative affect descriptors, over and above sex and age, was highest for narcissism (Table 2). Since values of f^2 of .02, .15, and .35 can be interpreted as small, medium, and large effect sizes (Cohen, 1988) obtained effect sizes were medium to large. When all affectivity was considered simultaneously, narcissism remained more closely related to positive affectivity compared to other two dark traits. In case of negative affectivity, all three dark traits were negatively related to feeling afraid, and Machiavellianism and psychopathy were most strongly associated to feeling hostile.

Table 2: Standardized regression coefficients from hierarchical multiple regression analyses predicting Dark Triad traits from sex, age, and PA and NA descriptors

	N	M	P
Step 1			
male sex	.10**	.17***	.23***
age	-.08*	-.13***	-.11**
Step 2			
Positive affect			
determined	.09*	.03	.08*
active	.05	.00	.01
proud	.17***	.07	-.05
strong	.17***	-.03	.09*
excited	.09*	-.07	.04
enthusiastic	.07	-.07	-.04
alert	-.01	.06	.01
inspired	.06	.00	-.03
interested	-.02	-.05	-.06
attentive	-.11**	-.05	-.11**
Negative affect			
jittery	-.01	.18*	.11*
upset	-.04	.02	.02
nervous	.17***	-.01	-.04
afraid	-.09*	-.15**	-.19***
guilty	.13***	.02	.06
scared	-.04	.01	.06
irritable	.10*	.02	.13**
ashamed	-.13***	-.09*	-.03
distressed	-.06	.01	.04
hostile	.02	.23***	.27***
Step 1 R^2	.008*	.071***	.095***
Step 1 $F(2, 871)$	3.72	33.43	45.46
Cohen's f^2 for step 1 R^2	.01	.08	.10
ΔR^2	.264***	.123***	.168***
$\Delta F(20, 851)$	15.43	6.47	9.70
Cohen's f^2 for ΔR^2	.36	.15	.23
Total R^2	.272***	.194***	.263***
Total $F(22, 851)$	14.47	9.31	13.78
Cohen's f^2 for total R^2	.37	.24	.36

Note. Level of significance for regression coefficients was determined using bootstrap procedure based on 1000 samples.

* $p < .05$. ** $p < .01$. *** $p < .001$

Discussion and conclusion

The results of this study showed that narcissism was positively related to positive (e.g. proud and strong) and negatively to negative affectivity (e.g. nervous and guilty), reflecting two common faces of narcissism (Wink, 1991). On the other hand, psychopathy was mostly related to negative affectivity (e.g. hostile and unafraid), while Machiavellianism was predicted solely by negative affectivity (e.g. hostile and jittery),

highlighting further distinctions between these two traits. Moreover, effect size of dark traits variance explained by affectivity was large in case of narcissism, indicating that affectivity is more pronounced in narcissism than in the other two dark traits and reiterating that narcissism is “lighter” than the other two Dark Triad traits (e.g. Aghababaei & Błachnio, 2015).

When interpreting results of the present study, it should be beard in mind that our sample was predominately female, so further research is needed to examine the role of sex in examined relationships. If we take into account that dark traits are considered to be linked with some affectivity deficits (e.g. Jonason & Krause, 2013), further research could include other methods of affectivity measurement, like other-ratings, or momentary feelings.

Nevertheless, the obtained results reflect theoretically meaningful relations between the affectivity and Dark Triad, but also highlight affective specificities of each of the Dark Triad traits. They also indicate that dark shades of personality are not entirely dark, especially in the case of narcissism.

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The role of values in reactive and proactive aggression

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Abstract

The current study aimed to explore the relationship between different value orientations (i.e., self-realization, conventional and hedonistic) and reactive and proactive aggression. Data was collected on 180 students (67% females) with a mean age of 22 years ($SD = 4.14$) from faculties in Zagreb, using the Value Orientation Scale (VOS, Franc, Šakić, & Ivčić, 2002) and the Reactive-Proactive Aggression Questionnaire (RPQ; Raine et al., 2006). As predicted, self-realization and conventional values were related to proactive aggression. Contrary to expectation, conventional values were unrelated to reactive aggression. As expected, hedonistic values showed a positive relationship with both proactive and negative aggression. The results indicated that values are an important predictor of aggression. Additionally, the results indicated that proactive and reactive aggression has different etiologic because dimensions of aggression are related to different values.

Keywords: value, reactive aggression, proactive aggression

Introduction

Values reflect what is important to individuals in their lives and influences an individual's behavior (Anglim, Knowles, Dunlop, & Marty, 2017; Schwartz & Bilsky, 1990). In recent decades, research has focused on the universality and cross-cultural validation of value models (Schwartz & Rubel 2005). Self-realization values include the realization of close, friendly relationships with other people, to love and be loved, independence, and creativity (Benish-Weisman et al., 2017; Franc, Sučić, & Šakić, 2008). Conventional (traditional) values entail harmonious family life, honesty, and morality, helping others, contribution to society (Franc et al., 2002), while hedonistic values include the pursuit of good earnings, a high standard of living, stability, comfort, excitement, comfortable life and effortless work, social reputation, power, and influence over others (Franc et al., 2008).

Aggressive behavior involves a socially unacceptable, disturbing value system. Aggression is expressed in different ways (e.g., physical, verbal, social, direct, active). Raine et al. (2006) emphasize that intrinsic motivation is key to distinguishing between reactive and proactive aggression. Reactive aggression (hostile or impulsive aggression) refers to angry and impulsive responses, which are usually triggered by the provocation or stimuli subjectively interpreted as a provocation, and often associated with impulsivity and emotions (Raine et al., 2006). Proactive (instrumental, premeditated, "cold-blooded") aggression refers to goal-oriented predatory aggression which is typically unprovoked (Dodge, 1991). This type of aggression includes bullying, stealing money

and similar goal-oriented instrumental behaviors (Raine et al., 2006). Based on this assumption, we analyzed the associations between reactive and proactive aggression and different value orientations (i.e., self-realization, conventional, and hedonistic).

Current study and hypotheses

In line with the notion that self-realization values include friendly relationships with other people and love, (Franc et al., 2008; Benish-Weisman et al., 2017), and based on the theory that proactive aggression refers to goal-oriented predatory aggression (Raine et al., 2006), we predicted a negative association between self-realization values and proactive aggression.

Based on the theory that conventional (traditional) values entail honesty, morality, and contribution to society (Franc et al., 2002), and in line with previous findings showing that conventional values were negatively associated with meanness and disinhibition (Ljubin Golub & Sokić, 2016), we hypothesized that conventional value orientation would be negatively related to both dimensions of aggression.

Given that utilitarian-hedonistic values orientation includes propensity for a comfortable life without much effort (Franc et al., 2008), we expect that utilitarian-hedonistic values would be positively related to proactive and reactive aggression.

Method

Participants

The research sample was composed of 180 students (67 females) with a mean age of 22 years ($SD = 4.14$), from various faculties in Zagreb. Participants were asked to complete a battery of self-report measures anonymously.

Measures

Value Orientation Scale (VOS, Franc et al., 2002) distinguishes three core value orientations: self-realization (5 items), conventional (6 items), and hedonistic (7 items). The items are scored on a 5-point Likert-type scale ranging from 1 (not important at all) to 5 (very important).

The Reactive-Proactive Aggression Questionnaire (RPQ; Raine et al., 2006) is a self-report measure that distinguishes the reactive and proactive aggression. The RPQ consists of 23 items: 11 items which measure reactive aggression, and 12 items which measure proactive aggression. The items are scored on a three-point scale ranging from (never [0], sometimes [1], often

[2]). The RPQ was used in previous research (Sokić & Ljubin Golub, 2019). A higher score on each of the subscales indicates a more highly pronounced respective dimension.

Results

Descriptive statistics and bivariate correlations between all variables are shown in Table 1. All scales demonstrated adequate internal psychometric characteristics in terms of reliability. Bivariate correlations showed that reactive and proactive aggression were moderately related. As predicted, both dimensions of aggression were positively related to hedonistic values. Proactive aggression was negatively related to self-realization and conventional values.

Table 1
Correlations, descriptive statistics, and internal consistency for all the variables

	1.	2.	3.	4.	5.
1. Reactive aggression	-				
2. Proactive aggression	.41**	-			
3. Self-realization values	.03	-.37**	-		
4. Conventional values	-.08	-.24*	.56**	-	
5. Hedonistic values	.25*	.36**	.28**	.21*	-
<i>M</i>	9.73	2.29	22.66	25.16	26.28
<i>SD</i>	3.34	2.77	2.07	3.08	4.31
α	.71	.78	.62	.63	.72

Note. α = Cronbach's α . ** $p < .01$. * $p < .05$

Hierarchical regressions were performed to test the predictive power of value orientations in explaining reactive and proactive aggression. In both models, gender and age were entered as predictors at Step 1, and self-realization, conventional, and hedonistic values were entered as predictors at Step 2.

As predicted (see Table 2), reactive aggression showed positive relation with hedonistic values, though contrary to expectation it was unrelated to the self-realization and conventional values. Consistent with prediction, proactive aggression showed positive relation with hedonistic values, and negative relation with self-realization values. Contrary to prediction, proactive aggression was unrelated to the conventional value. Results of hierarchical regression analyses showed that values together explained 18% of the variance in proactive aggression [$F(5,175) = 9.10, p < .01$], and 7% of the variance in reactive aggression [$F(5,175) = 2.30, p < .05$].

Table 2

Hierarchical regression analyses with values orientations as predictors of reactive and proactive aggression (N = 180)

	Reactive Aggression	Proactive aggression
Step 1		
Gender	-.03	-.36**
Age	-.12	-.19
R^2	.02	.20**
Step 2		
Gender	-.01	-.19
Age	-.09	-.19*
Self-realization values	.09	-.30**
Conventional values	-.08	-.01
Hedonistic values	.25*	.35**
ΔR^2	.07*	.18**
Total R^2	.09*	.38**

Note. Standardized beta coefficients (β) are shown.

** $p < .01$. * $p < .05$.

Discussion, conclusions, and limitations

The results of the study confirmed most of the research hypotheses, supported the values-aggression relationships and suggested that values are an important predictor of aggression. These results are in line with the theoretical assumptions proposed that proactive and reactive aggressive linked to different values.

In line with predictions, hedonistic values uniquely positively predicted both reactive and proactive aggression. This finding is in line with the theoretical assumptions that hedonistic values entail excitement, comfortable life and effortless work, power, and influence over others. Our results are in line to the previous studies (e.g., Ljubin Golub & Sokić, 2016; Roccas, Sagiv, Schwartz, & Knafo, 2002) showing that hedonistic values are associated with meanness, agreeableness, angry hostility and impulsivity, the same patterns which is a characteristic of aggression.

As expected, self-realization values negatively predicted proactive aggression. This is in line with a theoretical description that self-realization values captured realization of close intimate and friendly relations (Franc et al., 2002). Contrary to our hypothesis, conventional values were not a significant predictor of reactive aggression.

The relations between values and different functions of aggression have an important potential for supporting and clarifying etiological assumptions and understanding cognitive mechanisms that characterize aggression such as learning, perception and opinion. According to Bandura's social learning theory (Bandura, 1961), aggression is learned from the environment through imitation and observation. Values are also the result of an

individual's socialization and it is therefore reasonable to assume that they influence the expression of different dimensions of aggression. Present study confirm the differential correlates of proactive-reactive aggression and support a two-factor model proactive and reactive aggression (Raine et al., 2006).

There are several limitations to this study that need to be acknowledged. First, the sample used is undergraduate students, which limits external validity. Therefore, future studies should also use general population samples, clinical and incarcerated samples. Second, we used only self-report measures, which could be influenced by social desirability and cross-sectional data. Third, some scales (e.g., self-realization and conventional) showed low internal consistencies, so it would be good in future to use more reliable measures. Finally, further studies should use other induced or observed measures of aggression to verify the findings of this study and strengthened the external validity of the findings.

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Should Liberalism be a Part of Openness to Experience as its Facet?

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Abstract

Both the HEXACO model and the Big Five model of personality suggest that the trait Openness to experience is a complex construct, whereby in some conceptualizations of the Big Five model, such as the IPIP-Big Five, the construct comprises the facet Liberalism. The aim of this research was to examine the relationship between Liberalism as a facet from IPIP Big Five Model Openness and other facets of Openness from two personality models – Big Five and HEXACO. Items related to Openness from the IPIP Big-Five factor markers (which consists of two subdomains – Pure Openness and Pure Intellect) and HEXACO-PI-R were administered to the sample of 540 participants. Results show that Liberalism has the lowest correlations with facets from Pure Openness and also showed the lowest correlation with all the facets from HEXACO Openness. Liberalism also shows low correlations with facets from its Pure Intellect subdomain: Adventurousness and Intellect. While other facets from IPIP-Big Five Openness show moderate to high correlations with HEXACO Openness domain, Liberalism correlates weakly. Considering the weak correlations between Liberalism and the other Openness facets it can be concluded that this facet does not fit well into Openness domain, i.e., that Liberalism is not a proper reflection of Openness trait.

Keywords: Liberalism; Openness to experience; HEXACO-Openness; IPIP-Openness

Introduction

Openness to experience is a basic personality trait which in the broadest sense can be described as a preference for different and new things in various life domains (McCrae, 1993-1994; McCrae and Costa, 1985; 1994 as cited in McCrae, 1994). It is one of the factors in both the Big Five and Five-Factor models of personality (Digman, 1990; McCrae, 1994), and more recently in the HEXACO personality model (Ashton, 2013; Ashton & Lee, 2007; Ashton & Lee, 2008).

Both the HEXACO model and the Big Five model suggest that Openness to experience is a complex construct, whereby in some conceptualizations of the Big Five model, such as the IPIP-Big Five, the construct comprises the facet Liberalism (Christensen et al., 2019; DeYoung et al., 2007; Johnson, 2014). HEXACO model proposes that facets of Openness to experience are Aesthetic Appreciation, Inquisitiveness, Creativity and Unconventionality, while in IPIP-Big Five Openness consists of Imagination, Artistic Interests, Emotionality

that form the subdomain Pure Openness, and Adventurousness, Intellect, Liberalism that form the subdomain Pure Intellect (Johnson, 2014; Lee & Ashton, 2018).

Liberalism as a facet in IPIP-Big Five Openness contains items about crime, law, and order, and is a counterpart to NEO-PI-R's Openness to Values (Johnson, 2014). It has been previously shown that Liberalism, Emotionality, and Imagination have weak loadings on Openness to Experience (Kajonius & Johnson, 2019). Also, previous studies show that Liberalism has the lowest correlations with other measures similar to intellectual openness such as variety seeking (Griffin & Hesketh, 2004). On the other hand, compared to other Openness facets, Liberalism has highest correlations with basic social attitudes and orientations such as conservatism and right-wing authoritarianism (Hotchin & West, 2018).

Thus, the aim of this research was to examine the relationship between Liberalism as a facet from IPIP Big Five Model Openness and other facets of Openness from two dominant personality models – Big Five and HEXACO.

Method

Sample

The sample consisted of 540 participants ($M_{age} = 27.50$, $SD_{age} = 9.33$; 75.6% females). The participants were recruited via snowball method through social media.

Instruments

Openness from the International Personality Item Pool Representation of the NEO PI-R™ (IPIP-NEO-300; Johnson, 2014). For the purposes of the study, 60 Likert-type items related to Openness from the IPIP-NEO-300 were used. It consists of six facets – Imagination (10 items; $\alpha = .84$), Artistic Interests (10 items; $\alpha = .76$), Emotionality (10 items; $\alpha = .75$) that form the subdomain Pure Openness (30 items; $\alpha = .86$), and Adventurousness (10 items; $\alpha = .73$), Intellect (10 items; $\alpha = .81$), Liberalism (10 items; $\alpha = .68$) that form the subdomain Pure Intellect (30 items; $\alpha = .83$). The Cronbach alpha coefficient of the internal consistency for the whole domain was $\alpha = .88$.

Openness to experience from the HEXACO Personality Inventory-Revised (HEXACO-PI-R; Lee &

Ashton, 2018). For the purposes of the study, 16 Likert-type items related to Openness to experience from HEXACO-PI-R were used. Openness to experience is measured with four facets: Aesthetic Appreciation (four items; $\alpha = .58$), Inquisitiveness (four items; $\alpha = .52$), Creativity (four items; $\alpha = .75$), and Unconventionality (four items; $\alpha = .47$). Cronbach's alpha coefficient of reliability for the whole domain was $\alpha = .77$.

Results

Results showed that Liberalism had the lowest correlations with facets from Pure Openness and also

showed the lowest correlation with all the facets from HEXACO Openness (Table 1). Liberalism also showed low correlations with facets from its Pure Intellect subdomain: Adventurousness and Intellect (Table 1). While other facets from IPIP-Big Five Openness showed moderate to high correlations (ranging from $r = .30$ to $r = .73$, all significant at $p < .01$ level) with HEXACO Openness domain, Liberalism correlated weakly ($r = .16$, $p < .01$).

Table 1: Relationships between examined variables – facet level

Facet	1	2	3	4	5	6	7	8	9	10
1. Liberalism (BF)	-									
2. Adventurousness (BF)	.28**	-								
3. Intellect (BF)	.22**	.48**	-							
4. Imagination (BF)	.18**	.25**	.36**	-						
5. Artistic Interests (BF)	.12**	.32**	.36**	.35**	-					
6. Emotionality (BF)	-.04	.13**	.18**	.37**	.41**	-				
7. Aesthetic Appreciation (HE)	.13**	.28**	.36**	.27**	.72**	.29**	-			
8. Inquisitiveness (HE)	.00	.34**	.40**	.15**	.26**	.02	.27**	-		
9. Creativity (HE)	.14**	.41**	.47**	.48**	.48**	.30**	.40**	.21**	-	
10. Unconventionality (HE)	.22**	.39**	.63**	.40**	.35**	.23**	.38**	.27**	.51**	-

Note. BF – IPIP Big Five; HE – HEXACO; ** $p < .01$

In addition, principal component analyses were conducted with number of components to be extracted set to one (Table 2). In the first analysis, when only IPIP-Big Five facets were included ($KMO = .72$, Bartlett $\chi^2 = 540.39$, $df = 15$, $p < .001$) Liberalism showed the lowest loading. In the second analysis ($KMO = .81$, Bartlett $\chi^2 = 1735.89$, $df = 45$, $p < .001$), when IPIP-Big Five and HEXACO Openness facets were included together, only Liberalism showed loading below .30. Therefore, the second principal component analysis provides the evidence for Liberalism allocation out of personality space shaped by Openness domain.

Table 2: Principal component analysis – facet loadings

Facet	IPIP-Big Five Openness Loadings	IPIP-Big Five and HEXACO Openness Loadings
Imagination	.68	.61
Artistic Interests	.71	.73
Emotionality	.53	.45
Adventurousness	.66	.62
Intellect	.72	.74
Liberalism	.38	.29
Aesthetic Appreciation		.69
Inquisitiveness		.46
Creativity		.74
Unconventionality		.73

Discussion

This study aimed to investigate the relationship between Liberalism as a facet of Openness and other facets of Openness from IPIP Big Five and HEXACO. Considering the weak correlations between Liberalism and the other Openness facets it can be concluded that this facet does not fit well into Openness domain, i.e., that Liberalism is not a proper reflection of Openness trait. The lowest loading on the first principal component, that is, the only loading below .30 obtained for Liberalism facet gives support for this conclusion. This is in contrast with the results that Openness to experience is a trait that is highly related to liberal political orientation (e.g., Carney et al., 2008; Klein et al., 2019; McAdams et al., 2013). However, similar results were obtained for the Values facet from NEO-PI-R, with the facet being only moderately correlated with the Pure Intellect subdomain (DeYoung et al., 2007). Although Costa and McCrae (1985) do not equate Openness to values with Liberalism, it can be noted that their Values facet defined as “the readiness to reexamine social, political and religious values” (p.12) subsumes liberalism. Moreover, some other previous finding regarding Values facet are indicating strong negative associations to conservatism and right-wing authoritarianism (Trapnell, 1994). From that point of view, it is not surprising the Values are the only facet from NEO-PI-R Openness domain that correlates below .30 with Openness trait from BFI and TIPI (Gosling et al., 2003). It should be noted that Liberalism is associated with low Conscientiousness, not only with high Pure Intellect or high Pure Openness (Carney et al., 2008). Also, in Goldberg’s (1990) Big Five structure the facet Conventionality is assigned to the Conscientiousness factor. A potential solution to this problem is using Unconventionality facet from HEXACO Openness, which was conceptualized in such a way as to exclude social, political, or religious attitudes (Lee et al., 2005). More precisely, the Unconventionality facet assesses an appreciation of nonconformity and eccentricity and an openness to unusual ideas in general, but it isn’t specified whether such ideas may be traditional or conservative versus modern or liberal. In future studies, it would be useful to do a more in-depth comparison between Liberalism and other socio-cultural variables, such as political party preference, moral judgment, social dominance orientation, etc. (Graham et al., 2009; Hirsh et al., 2010; Kugler et al., 2014). This study indicates that Liberalism does not properly reflect Openness to experience, and that alternative measures that do not include it such as HEXACO-PI-R should be used.

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PSYCHOLOGY OF EDUCATION

Educators' Beliefs about Creativity Development in Educational Setting

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Abstract

The goal of the study was to identify educators' beliefs about creativity development of children and youth in educational setting by applying the Expert Model of Supporting Creativity. Research participants included educators from preschools, primary schools, secondary schools and universities. Implicit theories of creativity questionnaire was administered, while answers to one question regarding the potential for creativity development in educational settings were analyzed. Data were analyzed using thematic analysis with a predefined coding scheme. Statistically significant differences were identified in educators' beliefs about the contribution of educational institutions in students' creativity development. Preschool educators pointed to the contribution of the free activities, educational climate, managing creativity and partnership more frequently, while university educators pointed to the teaching activities, teachers and the study program. We discuss how educators' beliefs can be transformed to provide the focus on developmental needs of children and youth during their schooling.

Keywords: creativity; creativity development; educators; beliefs; Expert Model of Supporting Creativity.

Beliefs about Creativity Development

Beliefs about creativity and creativity development refer to constructions about what creativity is, how it manifests itself and what are the ways to develop it (Maksić & Pavlović, 2011). These beliefs are a cornerstone of perceiving and evaluating creative behavior and creative products (Chan & Chan, 1999; Runco & Johnson, 2002). Importance of study into beliefs about creativity development is grounded in the impact these beliefs may have on what will be perceived as creative and in what ways it will be supported.

Educators' beliefs about creativity and creativity development are especially important because of the nurturing role of their work. Study into educators' beliefs about creativity may facilitate understanding of educators' behaviors, decision making and teaching practices in educational settings (Andiliou & Murphy, 2010).

Previous research into educators' beliefs about creativity pointed to a general positive attitude (Aljughaiman & Mowrer-Reynolds, 2005; Runco, Johnson & Bear, 1993). As some studies have shown, educators generally believe that creativity can be developed (Fryer & Collings, 1991; Kamylyis, Berki & Saariluoma, 2009). However, inconsistencies in educators' beliefs about creativity development have also been noted. For example, some studies found that although educators believe that creativity can be developed, they do not perceive themselves accountable for creativity development (Aljughaiman & Mowrer-Reynolds, 2005). Other studies have also pointed that educators may not perceive themselves as trained to design creative activities and support creativity (Mullet, Willerson, Lamb & Kettler, 2016). Educators' workload and standardized assessment were experienced as some of the disabling factors in supporting creativity (Andiliou & Murphy, 2010).

Goals of the Study

In our previous studies the Expert Model of Supporting Creativity was developed by means of inductive qualitative analysis (Maksić & Pavlović, 2009; 2011). The model included the following components: teaching/compulsory activities, extracurricular/free activities, educational climate, study program, teachers, managing creativity, and partnership for creativity. The goal of this study was to identify educators' beliefs about creativity development of children and youth in educational setting by applying the Model.

Method

Participants

Research participants included educators from preschools (N=116), primary schools (N=244), secondary schools (N=262) and universities (N=46). In case of preschools, primary schools and secondary schools over 90% of participants were teachers, while the rest of the participants were school administration and management. All participants from universities were teachers.

Instrument

Implicit theories of creativity questionnaire (ITC-Q) with multiple open-ended and closed questions was administered (Maksić & Pavlović, 2009; 2011; Pavlović & Maksić, 2019). Questions referred to the nature and manifestations of creativity, and the possibility for the development of creativity during formal education. In this paper we analyzed answers to one open-ended question regarding the potential for creativity development in educational settings at the level of formal education at which the educator is engaged (*How can educational institution contribute to the development of creativity?*).

Data analysis

Data were analyzed using thematic analysis with a predefined coding scheme based on the Expert Model of Supporting Creativity (Maksić & Pavlović, 2009; 2011). The unit of analysis was a unit of meaning corresponding to any of the categories from the Model. After the coding process, frequency analysis was carried out for all categories from the Model. Rao-Scott χ^2 was used to analyze differences in beliefs about creativity development (Decady & Thomas, 2000).

Results

Support of teaching/compulsory activities, stimulating educational climate and managing creativity dominated teachers' beliefs about nurturing creativity in all types of the educational settings. Teaching/compulsory activities were related to the implementation of the prescribed or intended study programs. The educational climate included aspects

of relationships among teachers and students that appeared in teaching/compulsory and extracurricular/free activities and had an impact on them. Managing creativity was the type of support related to the recognition, direction, and monitoring of creativity.

Supportive teaching and compulsory activities included learning through research, problem solving, work on tasks that demand creative answers, independent and teamwork, etc. Extracurricular and free activities related to students' interests and to offer them opportunities to learn more about their area of interest as well as to get to know other areas where they can develop new interests. The stimulating educational climate allowed students to express their opinions and make their own choices while learning. Encouraging teachers valued creativity and served as models who inspire their students to be creative. Supportive study programs were related to real life issues, and relevant for students. The partnership for creativity was related to social consensus on the importance of creativity and the provision of systemic public support.

However, statistically significant differences were identified in educators' beliefs about the contribution of educational institutions in creativity development (Rao-Scott $\chi^2(N = 605, df = 21) = 62,64, p < 0,001$). Preschool educators pointed to the free activities, educational climate, managing creativity and partnership more frequently, while university educators pointed to teaching activities, teachers and the study program (Table 1).

Table 1¹
Educators' beliefs about supporting creativity

Level of education	Types of supporting creativity (f)							Total participants
	Teaching	Climate	Extra-curricular	Program	Teacher	Managing	Partnership	
Pre-School	49	43	50	5	22	36	31	110
Primary School	85	60	45	13	28	61	23	219
Secondary School	106	75	55	19	31	65	22	235
University	23	10	1	7	12	9	3	41
Total responses	263	188	151	44	93	171	79	605
								989

¹ Types of supporting creativity: Teaching/compulsory activities, Educational climate, Extra-curricular/free activities, Teacher, Creativity management, Partnership for creativity.

The table does not provide data on the number of responses that were not classified (f= 20).

Discussion

The analysis points to a shift in focus from the child and the systemic support, in the beginning of the formal education, to the focus to the teacher's role at the end of formal education. This finding may be to some extent surprising as all levels of formal education would require a focus on partnership and systemic support in creativity development. It may indicate the real situation in the treatment of creativity in educational institutions at different levels.

In comparison to previous studies (Aljughaiman & Mowrer-Reynolds, 2005), we found that educators tended to perceive themselves as accountable for creativity development of learners, which is a promising piece of information. However, the lack of the systemic perspective in supporting creativity through partnering with all relevant stakeholders stands out as a potential disabling factor in our study.

The findings further point to a need for raising awareness about educators' beliefs and their implications for learners' creativity. Moreover, we may point to a need for transforming educators' beliefs towards a more balanced and learner centric views at all levels of education. For future research and policy making remains the challenge of transforming educators' beliefs so that the necessary focus on developmental needs of children and youth is provided, as well as the systemics perspective of creativity development in society.

Conclusion

In this study we identified educators' beliefs about creativity development of children and youth in educational setting by applying the Expert Model of Supporting Creativity. Identification of different types of beliefs can be the first step in the process of changing these beliefs at the individual, institutional and societal level. Recommended interventions for changing educators' beliefs include different types of professional and organizational development activities.

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High School Students' Achievement and Motivation in Mathematics – Do gender and gender role identification play a role?

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Abstract

Studies showed that female students have lower Mathematics self-efficacy and stronger Mathematics related anxiety and that they value Mathematics less than their male counterparts. Since there were no studies in the Serbian context exploring the relationship between gender and gender role identification with achievement and motivation in Mathematics, the aims of this study were to investigate if there were gender differences in achievement and motivation in Mathematics, and if Mathematics achievement and motivation were dependent on gender role identification. Sample included 206 high school students. The short version of Bem Sex Role Inventory was applied. Instruments on motivation designed for this study relied on Expectancy-Value theory. While no gender differences in the achievement and self-efficacy were found, results showed that the male students valued Mathematics more than their female counterparts, as it was determined in previous international studies. Correlation analyses between femininity and masculinity and achievement in Mathematics, self-efficacy and valuing showed that femininity correlates significantly positively with the achievement in Mathematics in the subsample of girls, while no other significant correlation was found. This can be explained by less traditional gender-related values of the students from our sample.

Keywords: Motivation; Achievement; Gender; Gender Role Identification; Mathematics

Introduction

Despite considerable efforts to change current educational and employment practices, males continue to be overrepresented in the fields of Science, Technology, Engineering and Mathematics (STEM) worldwide (Cheryan et al., 2017). Previous studies have shown that boys slightly outscore girls on high stakes Math tests, such as SAT in the USA and PISA in most Western countries (Halpern et al., 2007; Stoet & Geary, 2013). In Serbia, the gap in the Mathematics performance of girls and boys has been declining, although the scores are still somewhat higher in the group of boys (Pavlović-Babić & Baucal, 2012; Videnović & Čaprić, 2020). However, female students remain underrepresented in the

STEM related study programmes' fields in higher education (RZS, 2017).

In this research we draw on Expectancy-Value Theory (Eccles, 1983; 2009). Relying on this theory, boys' higher performance in Mathematics can be explained by their higher Mathematical self-concept or Mathematics self-efficacy, and greater valuing of Mathematics, compared to girls. Studies have mostly validated this assumption – boys express more confidence than girls in their Mathematic competence (Watt & Eccles, 2006) and more interest in Mathematics (OECD, 2015; Eccles & Wang, 2016; Jacobs et al., 2002). Girls' interest in Mathematics decreases as they move through adolescence (Lubinski & Benbow, 2006), so even highly talented girls tend to avoid math-intensive careers and opt for people-oriented careers with clear social purpose (Watt & Eccles, 2006). Additionally, girls show higher levels of Mathematics related anxiety and report lower levels of Mathematics self-efficacy and intrinsic and extrinsic motivation for learning Mathematics (OECD, 2015).

Female's poorer achievements in Mathematics can also be explained by the stereotype threat (Steele et al., 2002). Girls who themselves hold stereotypes about women's efficacy in Mathematics tend to have poorer performance and reduced desire to pursue a Math-intensive careers (Schmader, Johns, & Barquissau, 2004). When such girls highly identify with their gender, that is when they attribute characteristics typically perceived as feminine to themselves (e.g. caring, tender), their achievements in Mathematics tend to be even lower (Kiefer & Sekaquotewa, 2007).

Since there were no studies in the Serbian context exploring the relationship between gender and gender role identification with achievement and motivation in Mathematics among adolescents, the goals of this research were to investigate: a) if there were gender differences in achievement and motivation in Mathematics, and b) if Mathematics achievement and motivation were dependent on gender role identification.

Method

Participants

This research was done in one central Belgrade high school. Participants were 206 first- and fourth-grade students ($M_{age}=16.25$), 68% being females. Their participation was voluntary.

Instruments

Students filled out the questionnaire that included questions on their gender, school achievement („excellent”, „very good”, „good”, and „satisfactory”), and the mark in Mathematics (2-5, with 5 representing the highest mark), in the previous school year. The motivation in Mathematics was assessed through the single-item five-point Likert type scales for mathematical self-efficacy and valuing of Mathematics, both designed for the purpose of this study.

In this research gender role identification has been defined as identification with expectations of a society about the proper behaviors for a person of one's gender (either male or female) (Eagly, 2013). It was assessed by a short version of Bem Sex Role Inventory (Bem, 1974), which consists of ten masculine and ten feminine traits. Participants were asked to assess themselves on these traits on a seven-point Likert type scale. Reliability of both subscales was good ($\alpha_{Masculinity} = .89$, $\alpha_{Femininity} = .91$).

Data analyses

After the scores for Masculinity and Femininity had been calculated, descriptive statistics and correlational analyses were performed. Gender differences were explored using Man-Whitney test and t-test in IBM SPSS 25.0.

Results

Descriptive and correlational analyses

Results showed that most students had excellent school achievement (81.9%) and that they generally had high marks in Mathematics (see Table 1). Students' Mathematics Self-efficacy was somewhat higher than their belief that Mathematics is important (see Table 1).

Correlational analyses (see Table 1) showed that Mathematics Self-Efficacy and Mathematics Value correlated positively, but moderately with Mathematics Achievement, and with each other. Neither Masculinity nor Femininity correlated significantly with achievement and motivation measures.

Table 1. Descriptive statistics and correlations of variables

Variable	M	SD	Correlations				
			S.Achiev	M.Achiev	M.Self-eff	M. Value	Feminin.
M.Achiev.	4.21	1.02					
M.Self-eff.	5.13	1.83	.63**				
M.Value	4.53	2.09	.25**	.41**			
Feminin.	5.28	1	.26**	.41**	.52**		
Masculin.	5.53	.76	.14	.11	-.05	.09	
			-.01	.03	.09	.06	-.15*

* $p < .05$, ** $p < .01$; Correlations of School Achievement are calculated using Spearman's Rho coefficient, while the correlations of the other five variables are calculated using Pearson correlation coefficient.

Gender differences

There were no gender differences in School achievement ($U = 4376.5$, $p = .59$), nor in Mathematics achievement ($t(203) = .75$, $p = .56$). Females and males did not differ in the reported levels of Mathematics Self-efficacy, while there was a significantly higher valuing of Mathematics in the group of male students (see Table 2).

There were no significant gender differences in Femininity, while Masculinity scores in the group of male students were significantly higher than in the group of females (see Table 2).

Table 2. Gender differences testing results

Variable	M		SD		t*	p
	Girls	Boys	Girls	Boys		
M.Self-Eff.	5.06	5.26	1.78	1.92	.71	.48
M.Value	4.3	5.03	2.06	2.09	2.36	.02
Feminin.	5.34	5.15	1.04	0.92	-1.23	.22
Masculin.	5.12	5.45	0.77	0.69	2.93	.004

*df = 204

Correlation analyses between gender identification scales and achievement and motivation measures showed positive but low correlation between Femininity and Mathematics achievement ($r = .19$, $p = .02$) in the subsample of female students, while no other significant correlation was found.

Discussion and conclusion

High self-efficacy and performance of female students can be discussed in the light of growing popularity of STEM fields, particularly computer science, among youth due to good employment opportunities. Gender gap in STEM engagement proved to be lower in countries with less stable

economies (Stoet & Geary, 2018), Serbia being such a country. Although being equally successful as males, female students value Mathematics less, as already pointed to in previous studies (Lubinski & Benbow, 2006; Watt & Eccles, 2006). This finding implies that interventions aimed at motivating female students to pursue a STEM career should focus on their perceptions of such a career, its relevance and value. Therefore, future studies should explore the issues of value, meaning and relevance of STEM among females (both students and those who are employed) in more detail.

As for the relationship between gender role identification and Mathematics-related outcomes, our study showed that girls who identify more strongly with their gender tend to have better Mathematics achievement. This is opposite to previous findings (Kiefer & Sekaquaweta, 2007), but we may assume that this happened because of the characteristics of our sample which involved students from the central Belgrade high school who might adhere to less traditional values in general, and therefore – less traditional values related to gender roles. Additionally, one should consider that the general school achievement, as well as Mathematics achievement might not be as reliable as objective measures of competence in Mathematics (Kuncel et al., 2005; Vulperhorst, 2017). Therefore, for the future studies it would be useful to involve larger and a more diverse sample of students, to include objective measures of competence in Mathematics and to search for more thorough, preferably qualitative data on gender role identification.

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The Role of Trait Emotional Intelligence in Teaching: Can It Moderate the Effects of Student Disruptive Behavior on Teachers' Burnout?

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Abstract

Teachers are ranked high among burnout-affected professions, which has spurred interest in the factors and mechanisms that may enhance or relieve burnout in this profession. According to previous research, trait emotional intelligence (TEI) can prevent burnout, while disruptive student behavior (DSB) acts as a major work stressor in teachers. In this study, we examined the relations between teacher burnout, TEI and DSB, also testing for potential moderating effects of TEI in the DSB–burnout association. Participants were 70 subject teachers ($M_{age}=41.78$), who completed the Trait Emotional Intelligence Questionnaire-SF; the Maslach Burnout Inventory-Educator Survey; and the School Disruption Scale. Both TEI and DSB had statistically significant zero-order correlations with burnout (which, as expected, were of opposite directions), and together explained a substantial portion of the variance in all burnout dimensions. Moderation analyses testing for any interaction effects between TEI and DSB revealed that both had an independent and direct effect on burnout. The current results show that TEI meaningfully relates to burnout in teachers and may protect them from work-related stress. Also, our findings confirm that teachers who observe more inappropriate behaviors on part of their students are also more affected by burnout symptoms, yet the negative effects of these student behaviors do not seem to be moderated by TEI.

Keywords: teachers; burnout; trait emotional intelligence; disruptive student behavior

Introduction

Numerous studies report that teachers face a number of occupational risk factors and tend to experience high levels of stress and burnout. Within this profession, burnout has been related to both negative work- and personal-level effects (see Chang, 2009 and Mérida-López & Extremera, 2017 for summaries).

Maslach (1993) argues that the burnout syndrome includes three components, which may or may not be experienced at once: a) emotional exhaustion (EE)—feeling emotionally overwhelmed by intense

interactions with students, parents, and colleagues; b) depersonalization (DP)—negative attitudes and malevolence toward the students and a diminished feeling of competence; and c) reduced personal accomplishments (PA)—negative (self-)assessment of job performance and achievement.

Factors Related to Burnout in Teachers

The whys of teachers' occupational distress are located within three groups of factors (Chang, 2009).

Individual factors. These factors, also referred to as internal, include demographic (e.g., age, gender, years of experience) and personality characteristics (e.g., Big Five, self-esteem, coping, resilience), as well as available social support (from family and friends).

Organizational factors. These factors are external and refer to the environmental and contextual aspects of the job itself, including various features of the work (e.g., workload, time pressure, task diversity, low income, poor management), as well as student behavior and classroom dynamics (e.g., poor student achievement and motivation, inappropriate student behavior, increased classroom conflicts).

Transactional factors. This category attempts to capture the interplay between individual and organizational factors (e.g., perception of leadership style, attribution of student misbehavior).

The effects of these factors on burnout are reviewed in Chang (2009). In the present study, we draw on two sets of previous findings in particular: first, that Neuroticism (N) relates to higher burnout (Bianchi, 2018), while optimism serves as a shield from occupational distress (Moreno et al., 2005); and second, that disruptive student behavior (DSB) as a working condition is strongly associated with job stress and burnout (Ratcliff et al., 2010).

Trait Emotional Intelligence

Trait emotional intelligence (TEI) is defined as a constellation of self-perceptions regarding one's

typical behavior and performance in the socio-emotional realm (Petrides, 2010). High TEI is closely related to emotional stability and encompasses optimism as one of its facets, which is why it might be a personal strength that teachers draw on when dealing with stressful work events and circumstances.

Fiorilli et al. (2019) summarize previous findings to conclude that there is a tight relationship between TEI and well-being in the workplace, since those with high TEI are more likely to see themselves as efficient, experience positive emotions, pursue constructive relationships, and treat life challenges in a way that promotes well-being, job commitment and satisfaction.

Disruptive Student Behavior

DSB is every behavior considered inappropriate for the setting or situation in which it occurs (Charles, 1999); it interrupts teaching (and examination) in an intentional and repeated manner. DSB includes neglect of time schedule (e.g., late arrival, early

departure, skipping), disrespect of classroom rules (e.g., chatting, drinking, eating, texting, sleeping), inappropriate communication (e.g., shouting, arguing, dominating, challenging), and ignoring instructions.

Närhi and colleagues (Närhi, Kiiski, & Savolainen, 2017) conclude that DSB has severe negative impacts on students' school achievement and postschool adjustment, and that it increases work-related stress and reduces well-being for teachers.

The Current Study

The upsurge of positive psychology has led to a proliferation of studies investigating personal resources in alleviating burnout (Otero-López et al., 2014). The current study builds on this trend by examining to what extent a combination of DSB and TEI contributes to the prediction of burnout dimensions. Moreover, it looks into a previously unexplored issue: the potential moderating role of TEI in the DSB–teacher burnout relationship.

used to assess TEI and its four factors: Well-Being (WB), Self-Control (SC), Emotionality (Em), and Sociability (Soc).

Burnout. The Maslach Burnout Inventory-Educators Survey (MBI-ES; Maslach et al., 2012) was used to assess the three burnout dimensions—EE, DP, and PA.

Disruptive student behavior. The School Disruption Scale (SDS; Veiga, 2011) was used to obtain teachers' evaluations of the occurrence of DSB in their work environment.

Results

Table 1 presents the descriptive statistics referring to levels of burnout, TEI, and DSB in the present sample, as well as their intercorrelations.

Method

Sample and Procedure

Data were collected on a sample of 70 (57 females) subject teachers from five primary schools in Belgrade. Their age ranged from 24 to 59 years ($M=41.78$), while length of service varied from 6 months to 44 years ($M=14.04$). All teachers were recruited at their workplace, where they were informed about the purpose of the study and presented the instruments that they were asked to fill out.

Measures

Trait EI. The Trait Emotional Intelligence Questionnaire-SF (TEIQue-SF; Petrides, 2009) was

Table 1: Descriptive statistics and zero-order correlations of burnout, TEI, and DSB

	EE	DP	PA	WB	SC	Em	Soc	TEI	DSB
EE	1.00								
DP	.53**	1.00							
PA	-.51**	-.50**	1.00						
WB	-.31**	-.36**	.33**	1.00					
SC	-.39**	-.35**	.54**	.55**	1.00				
Em	-.24*	-.24*	.28*	.64**	.57**	1.00			
Soc	-.23	-.21	.40**	.57**	.49**	.53**	1.00		
TEI	-.38**	-.36**	.49**	.83**	.80**	.85**	.77**	1.00	
DSB	.41**	.34**	-.35**	-.21	-.25*	.00	-.08	-.16	1.00
<i>Mean</i>	19.23	2.97	37.10	5.81	5.02	5.62	4.84	5.36	2.79
<i>SD</i>	11.82	4.10	7.80	.83	1.00	.91	.97	.76	.67

Notes. EE–Emotional Exhaustion; DP–Depersonalization; PA–Personal Accomplishment; WB–Well-Being; SC–Self-Control; Em–Emotionality; Soc–Sociability; TEI–global trait emotional intelligence score; DSB–disruptive student behavior.

A regression model comprising TEI and DSB successfully predicted burnout by explaining 27% of EE ($F_{(2, 67)} = 12.56, p < .001$), 21% of DP ($F_{(2, 67)} = 9.08, p < .001$), and 31% of PA ($F_{(2, 67)} = 15.13, p < .001$) variability. In all three cases, both TEI and DSB were significant predictors. Additional moderation analyses, conducted to test for any interaction effects between TEI and DSB, revealed that each predictor had an independent and direct effect on the examined criteria.

Discussion and Conclusions

The purpose of the current study was to examine the relations of DSB and TEI with burnout in teachers. An additional goal was to test for moderation by TEI in the DSB–burnout relationship.

As expected, both DSB and (global) TEI were statistically significantly and moderately associated with burnout, yet in opposite directions: DSB was positively related to EE and DP, and negatively to PA, while the reverse was true of TEI. The above pattern corroborates the assumed role of TEI as a protective factor and of DSB as a risk factor in the emergence of burnout in teachers. The slightly larger correlation of DSB with EE (than with DP and PA) is also in line with previous research (Otero-López et al., 2008) and quite understandable, as an immediate consequence of DSB is likely to be teachers' increased emotional effort to overcome their frustration with and provide containment for the student. In accordance with Fiorilli et al.'s (2019) findings, the TEI factors of Well-Being and Self-Control emerged as the strongest correlates of burnout, suggesting that TEI entails the personal resources to deal with work-related challenges mainly in terms of high self-esteem, general optimism, and the ability to manage stress and regulate one's own emotional reactions.

As shown by regression analyses, DSB and TEI jointly explained a substantial proportion of variability in all three burnout dimensions. The effects of both predictors were direct and there was no moderation of the DSB–burnout association by TEI. One important implication of this finding is that teachers may benefit from trainings which address both their emotional self-efficacy and their capacities to manage students' behavior in class. Nevertheless, the same finding also suggests that external factors of teachers' burnout, such as DSB, cannot be cancelled out by internal/personal resources, such as high TEI: To reduce the risks of teachers' burnout, it may be necessary to introduce both individual and organizational-level measures.

Acknowledgments

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Psychometric validation of the ICAR Matrix Reasoning test

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Abstract

There are very few brief cognitive ability tests available for educational and other general research. The goal of this study was to offer a preliminary psychometric validation of the short, royalty free, 11-task ICAR Matrix Reasoning (MR) test in educational research setting, in Serbian culture. Three samples (from the Republic of Srpska) were used: elementary school 9th graders ($N=510$), high school 4th graders ($N=544$), and university students ($N=508$). Results show that the proposed single factor MR model has good fit. Under 2PL IRT model, items have moderate to high discrimination and difficulty around the middle of the latent trait. Most of the test information value resides in the middle-to-upper end of the latent trait. There is no significant differential item functioning between the samples or genders. ICAR MR scores have the highest correlation with the GPA of elementary school students ($r=.39$), followed by high school students ($r=.26$), and university students ($r=.11$). ICAR MR test scores also correlate highly with the ICAR Progressive Matrices test ($r=.52$; value available only for the elementary school subsample). We conclude that ICAR MR test has adequate psychometric properties for a short general intelligence test and we recommend its use for educational research purposes in the Serbian culture.

Keywords: matrix reasoning; short intelligence test; item response theory (IRT); ICAR Project

Introduction

Short intelligence tests represent convenient way of conducting cognitive ability testing in educational

research. However, there are very few such tests available, especially royalty free (Condon, & Revelle, 2014; Dworak et al., 2020).

ICAR project is a collaborative initiative of several reputable universities aimed at offering various 'free of charge' cognitive tests to general research public (Condon, & Revelle, 2014; Dworak et al., 2020). Some of these tests have already been preliminary validated in the Serbian culture (e.g., Jankovski et al., 2017). Other ICAR measures have been used in research from the Serbian culture, but without prior formal psychometric validity studies. Most notably, this includes a short ICAR Matrix Reasoning (MR) test (Condon, & Revelle, 2014), which has been utilized in several educational studies to date (e.g., Lugonja et al., 2018; Subotić et al., 2019). Given its short length and royalty free status, ICAR MR test potentially could be an excellent choice for a rough, fast cognitive ability assessment in educational and other general research setting.

The goal of this research was to conduct a psychometric validation of the ICAR MR test on elementary school, high school, and university educational levels in the Republic of Srpska. This should offer the first insight into psychometric characteristics, including convergent and criterion validity of the ICAR MR test in the Serbian culture.

Method

Sample

Three Republic of Srpska's samples were used: elementary school students ($N=510$; 52.2% females), high school students ($N=544$; 57.7% females), and university students ($N=508$; 58.5% females). Both elementary and high school subsamples were comprised of the final school year students, i.e., 9th elementary school grade ($M=14.52$, $SD=1.07$ years of age) and 4th high school grade ($M=18.47$, $SD=1.06$ years of age). University subsample was comprised of students from all academic years of study (7.5% 1st year, 28.9% 2nd year, 36.0% 3rd year, 25.0% 4th year, 2.6% 5th year; age: $M=27.07$, $SD=10.52$ years).

Measures and procedure

ICAR MR test (Condon, & Revelle, 2014) comprises of 11 matrix reasoning tasks similar to the Raven's progressive matrices. Each task has a set of six distractors, with one normatively correct answer.

Progressive Matrices (PM) test, also available as a part of the ICAR project (Condon, & Revelle, 2014), was used as a convergent validation measure for the MR test. This test also resembles Raven's progressive matrices. It has 30 tasks, with eight possible distractors. This test has been examined in Serbian culture, showing acceptable properties (Jankovski et al., 2017).

Data were collected using a pan & paper procedure. School samples data were collected during the 2017/18 school year, as a part of the UNICEF supported project entitled "Establishing a referral mechanism for supporting children in the schools of Republika Srpska". University sample data were conducted mostly during the 2018/19. academic year, as a part of several academic research projects. All respondents completed the ICAR MR test, while only the elementary school students completed the ICAR PM test in addition. Tests were administered without a specific time constraint.

Analyses were done in 'jamovi' (The jamovi project, 2020), 'ltm' (Rizopoulos, 2006), and 'mirt' (Chalmers, 2012).

Results

Latent structure of the MR test could be considered functionally unidimensional, given that proposed single factor model has good fit (Hooper et al., 2008): CFI=.97, TLI=.96, RMSEA=.04, SRMR=.04, although factor loadings are moderate, ranging from .46 to .64 ($M_A=.56$).

Table 1: ICAR MR test IRT analysis

No.	<i>b</i>	<i>a</i>	<i>I</i> (% between -3, 3)
1	-0.78	1.22	1.22 (92.72)
2	-0.19	1.11	1.11 (92.91)
3	0.08	1.40	1.40 (96.99)
4	0.32	1.39	1.39 (96.69)
5	0.26	1.28	1.28 (95.58)
6	0.23	1.43	1.43 (97.12)
7	1.72	0.82	0.82 (71.99)
8	0.18	1.11	1.11 (92.87)
9	1.19	0.87	0.87 (80.56)
10	1.01	1.10	1.10 (88.85)
11	0.72	1.11	1.11 (91.04)

There are mostly no notable residual correlations between the items (the highest std. LD is .14). Also, there is no significant differential item functioning between the student and gender groups. Note that the test also has acceptable to good internal consistency according to classical test theory: $\alpha=.84$, $\omega=.74$.

Results of the 2PL IRT analysis are shown in Table 1. Items difficulty varies from a moderate to higher (*b*), mostly clustered around the middle (slightly to the higher end) of the latent trait (Theta) interval. According to common guidelines for interpreting IRT discrimination (Baker, 2001), three items (No. 3, 4, and 6) have high discrimination (i.e., $1.35 < a < 1.69$), while the remaining eight have moderate discrimination (i.e., $0.65 < a < 1.34$).

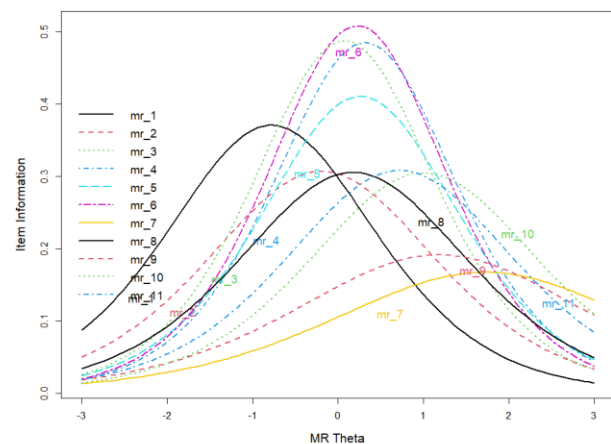


Figure 1: MR test individual item information between -3 and 3 logits.

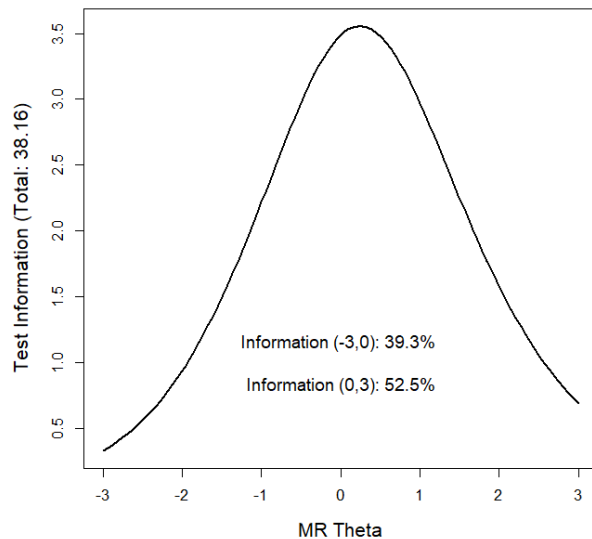


Figure 2: MR test total information between -3 and 3 logits.

Most items have slightly higher information (I) in the middle or upper middle latent trait range (Figure 1), with only one item having less than 80% of its information inside -3 to 3 logit range (Table 1). Consequently, test in total has notably more information value in that same middle-to-upper interval (Figure 2).

Test means are the lowest in elementary school subsample ($M=3.84$, $SD=2.53$), followed by high school subsample ($M=4.56$, $SD=2.48$), with the highest values in university subsample ($M=5.42$, $SD=2.98$).

MR test scores have the highest correlation with the GPA for elementary school students ($r=.39$, $p<.001$), followed by high school students ($r=.26$, $p<.001$), and university students ($r=.11$, $p=.017$; note: correlation adjusted for the years of study).

ICAR MR test scores correlate highly with the ICAR PM test ($r=.52$, $p<.001$) within elementary school subsample.

Discussion

Our preliminary psychometric evaluation of the ICAR MR test shows generally good psychometric properties for a brief general cognitive ability test. The test appears to be best suited for the participants with average or slightly above the average levels of the matrix reasoning trait, with moderate to high ability to discriminate between the low and high scores. Although older students obtain higher average scores than younger students, the test shows no

“bias”, i.e., DIF, making direct comparisons between the group means appropriate.

We were only able to test for the convergent validity on the elementary school subsample, where the ICAR MR test shows high correlation with a similar ICAR PM test, which has been already examined in the similar setting (Jankovski et al., 2017). Regarding its criterion validity, the ICAR MR test correlates in a lower to moderate range with the participants’ GPA, with the value decreasing as the education level increases. The magnitude of these correlations is in line, albeit at the lower end of the interval typically reported in the literature (Roth et al., 2015). However, this is understandable, given ‘the briefness’ of the test and the lack of the correction for a range restriction (Wiberg & Sundström, 2009), which is presumably especially important for the university subsample, where the lowest correlation between the matrix reasoning and the GPA was obtained. Note that university GPA averages are expected to vary between different fields of study (e.g., Lugonja et al., 2018), which we were not able to adjust for on this sample. This likely further reduced the magnitude of the obtained reasoning~GPA correlation on this subsample.

We conclude that ICAR MR test has adequate psychometric properties for a short general intelligence test and we recommend its use for educational research purposes in Serbian culture, when the goal is fast, easy, and relatively rough cognitive ability assessment. However, further studies should conduct a more thorough examination of the ICAR MR’s convergent and criterion validity, considering more education levels and a wider range of cognitive ability and academic achievement measures.

Test permissions should be obtained from The International Cognitive Ability Resource (ICAR) project (<https://icar-project.com/>).

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GPA, Personality, Intelligence, and Attitudes Towards Science as Correlates of Scientific Misconceptions Amongst University Students

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Abstract

Science-related misconceptions & “myths” are related to various negative academic and socio-economic outcomes. We wanted to determine the prevalence of common scientific misconceptions among university students and their association with several relevant correlates, namely: students’ GPA, intelligence, personality, and attitudes towards science (ATS). The sample comprised 516 Republic of Srpska’s (B&H) university students (58.9% females) of various years and fields of study. The results show that the average score of correct answers about scientific misconceptions is around theoretical middle, with its significant correlates being higher intelligence, lower Neuroticism, and positive ATS. Correlations with ATS diminish but persist even when other examined variables are controlled for. Overall, GPA is a poor correlate of scientific misconceptions knowledge, the effect of personality is mostly limited to Neuroticism, with intelligence, and especially ATS, being weak but consistent correlates. Since intelligence is arguably unchangeable, this implies that an improvement in university students’ ATS might be a potential part of the strategy for improving their scientific literacy.

Keywords: scientific literacy; attitudes towards science; GPA; Big 5 personality; intelligence

Introduction

Acceptance of science-related misconceptions or “myths” has been shown to have detrimental effect

on scientific literacy and, in turn, predicts anti-scientific attitudes, lower academic achievement, and can arguably even lead to wider undesirable socio-economic outcomes (Hazen & Trefl, 2009; Osborne et al., 2003; Swami et al., 2012).

A large proportion of scientific literature on this topic deals with psychology myths and misconceptions (e.g., Lilienfeld et al., 2010), beliefs in a broader range of human- and non-human-related science myths (e.g., Swami et al., 2012), or some specific, individual myths (e.g., ‘the giant skeleton myth’; Swami et al., 2016).

In this study, we wanted to examine a prevalence of common scientific misconceptions among the university students in the Republic of Srpska, focusing on the topics from the natural sciences and mathematics domains.

Furthermore, in order to better understand the misconceptions trends, we wanted to determine their association with several relevant correlates, established in previous research (Hazen & Trefl, 2009; Hong & Lin, 2011; Osborne et al., 2003; Standing & Huber, 2003; Swami et al., 2012; Swami et al., 2016; Trautwein & Lüdtke, 2007), namely: students’ GPA, general intelligence, Big 5 personality, and attitudes towards science (ATS).

Method

Sample comprised 516 Republic of Srpska’s (B&H) university students (58.9% females; average age:

$M=22.60$ ($SD=2.94$) years) of various years and fields of study.

The students self-reported their GPA, completed a short Big 5 personality questionnaire (John et al., 1991; John et al., 2008; Lang et al., 2011) and ICAR’s short matrix reasoning, i.e., general intelligence test (Condon, & Revelle, 2014).

Students also completed the ATS questionnaire adapted for this study from previous unpublished working drafts. Parallel analysis (Subotić, 2013) suggests three ATS factors (54% of explained common variance), named as: Antipathy towards science and scientists (AS; 8 items, e.g.: “Scientific facts are given more credit than they deserve.”; $\omega=.92$), Importance and affinity towards science (IS; 7 items, e.g.: “Science makes our lives better and easier.”; $\omega=.81$), and Deficiency of science (DS; 6 items, e.g.: “Science can’t answer the majority of life’s most important questions.”; $\omega=.73$).

Scientific misconceptions were measured by 29 true-false questions about basic scientific facts and reasoning on which people are commonly mistaken, covering fields of mathematics, physics, chemistry, biology, and earth sciences & ecology. The questions compiled for this study were selected via consensus from the larger misconceptions pool created by the University of Banja Luka’s Faculty of Natural Sciences and Mathematics graduate students, as a part of the semestral Psychology course research project. Examples of the topics included in the selection are: vaccines causing autism, dinosaurs and human coexisting, basic probabilistic reasoning, etc.

Data was collected using an anonymous pan & paper procedure.

Statistical significance of the effects was assessed using the Bayes factor – BF_{10} , implemented in JASP (JASP Team, 2020), which represents the $H_A:H_0$ probability on a given dataset; values of $BF_{10}>10$ suggest substantial, and $BF_{10}>100$ suggest strong support for the H_A (Lakić, 2019; Wetzels & Wagenmakers, 2012).

Results

The results show that the average score of correct answers about scientific misconceptions is around theoretical middle of 14.5: $M=14.96$, $SD=4.06$. The most prevalent scientific misconceptions are shown in Table 1.

Table 1: The most prevalent scientific misconceptions.

Claim (Scientific Misconception)	Truth	% Wrong
<i>According to theory of evolution, humans came from monkeys.</i>	Theory of evolution views both humans and “monkeys” as modern animals, with common ancestry, none came from the other.	80
<i>For optimal health, everyone should drink 8 glasses of water per day.</i>	This is arbitrary, and the amount of water needed is very individual and generally well autoregulated, there is no need to consciously count it to a specific number of glasses.	79
<i>Wearing metal jewelry or talking on a cell phone during storm makes you more likely to get struck by lightning.</i>	Lightning occurs on too large of a scale to be influenced by small ground objects such as jewelry or phones.	76
<i>Synthetic chemicals are more toxic than their natural counterparts.</i>	If they have identical molecular structure, there is no functional difference between a substance that is synthesized in a lab and that same substance extracted from a “natural source”.	72
<i>Substances can be divided into two distinct groups: toxic and non-toxic.</i>	Substances are not inherently toxic or non-toxic, as it is all about the dosing (in relation to who exactly is taking them).	72
<i>Mixing up all the colors produces white.</i>	This works only for the additive mixing of projected light, not for the so-called subtractive mixing of paints or inks, which will, in fact, produce black (or something close to it).	72

The average score of correct answers about scientific misconceptions significantly correlates (all $BF_{10s} > 100$) with higher intelligence ($r = .27$), lower Neuroticism ($r = -.17$), lower AS ($r = -.27$), higher IS ($r = .19$), and lower DS ($r = -.19$).

Note that correlations with ATS dimensions diminish but persist (all $BF_{10s} > 10$) even when other examined individual differences variables are controlled for (AS: $r = -.18$; IS: $r = .15$; DS: $r = -.15$).

For individual misconceptions, all supported correlations (i.e., $BF_{10s} > 10$) are of a small intensity (r_s from $|.14|$ to $|.23|$). There is 1x positive correlation with the GPA, 7x positive correlations with intelligence, 2x negative correlations with Conscientiousness (suggesting lower chances of answering correctly on “men evolving from monkeys” and “bulls disliking color red” questions), 2x negative correlation with Neuroticism, 9x negative correlations with AS, 1x positive correlation with IS, and 2x negative correlations with DS.

Discussion

In the absence of an established reference point, lack of scientific misinformation among the students can be judged as moderate, with the average score being around the theoretical mean. The most frequent misconceptions relate to the theory of evolution, hydration, ‘natural’ and ‘toxic’ chemicals, mixing of colors, and the ability of certain everyday objects to influence lightning.

Overall, GPA is somewhat surprisingly weak correlate of scientific misconceptions knowledge, although such trends are not entirely uncommon (e.g., Impey 2011).

The effect of personality is mostly limited to Neuroticism. Previous research has highlighted the roles of its facet anxiety in susceptibility to knowledge of rumors and their transmission (usually done to try and ‘make sense’ in uncertain situations) (Bordia et al., 2006; DiFonzo, & Bordia, 2002; Houmanfar & Johnson, 2003). Surprisingly, even though Conscientiousness is a robust positive predictor of academic success (e.g., Trapmann et al., 2007), its contribution regarding misconceptions is small and – negative, as it predicts a lower chance of answering correctly on two biology related questions. While this requires further investigation, it might suggest that those topics are, in fact, thought incorrectly through the formal education and more Conscientious students were more likely to ‘pick up’ what they mistakenly thought was a correct information.

Intelligence, and especially ATS, are weak but consistent (and robust) correlates of scientific misconceptions. Since intelligence is arguably

unchangeable, an improvement in university students’ ATS might be a meaningful part of strategies for boosting their scientific literacy and reducing myth susceptibility. This, however, requires ATS to be causal for misinformation reduction, which cannot be claimed from this research design, but it is something that at least can be reasonably hypothesized (Osborne et al., 2003) and is worth looking into, given that ATS are arguably easier to change than other aspects of personality.

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DEVELOPMENTAL PSYCHOLOGY

Developmental Capacities of Children Aged 0 to 8 Living in a Home for Children Without Parental Care

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Abstract

The aim of this study was to assess the development of children currently living in a Children's Home in Bosnia and Herzegovina. The sample consisted of 16 children (6 boys). The children differed in terms of the current age (0 to 8 years), the age at which they were admitted to the Children's Home (2 months to 6 years), and the number of years spent there (3 months to 7 years). Children's development was assessed using the Developmental Behavioral Scales (DBS, Pištoljević, Zubčević, & Džanko, 2016) and the Developmental Test Čturić (DTC, Čturić, 2007). The results on the DBS show that most children did not reach the minimum considered as age-appropriate development in the areas of language, motor and cognitive development (13, 12 and 11 out of 16 children respectively). One half of the children did not reach that minimum in social development and self-help (8 and 7 out of 16 children respectively). The results on the RTČ confirm this trend, showing that only 3 children can be categorized as developing appropriately for their age. In general, the higher the number of years spent at the Children's Home and the lower the age of admittance, the bigger their developmental delays are. Our results confirm the need for intervention programs that would stimulate the development of these children until the conditions are met for them to leave the Home.

Keywords: early development; children without parental care; institutional care; developmental delay

Introduction

Institutional care is often associated with developmental delays and problems in different areas of development, particularly in physical growth, brain growth, cognition, attention, and atypical attachment development (for a recent review, see van IJzendoorn et al., 2020). The largest delays typically occur when institutionalization takes place in infancy and early childhood, while severe emotional deprivation can have an effect on a range of outcomes including cognitive impairment, disinhibited social engagement, inattention and hyperactivity (see, for example, Dozier et al., 2014; Smyke et al., 2009; Sonuga-Barke et al., 2017; The St. Petersburg-USA Orphanage Research Team, 2008; van IJzendoorn et al., 2020; Vorria, Ntouma, Rutter, 2014).

According to the latest available data, there were about 2.435 children without parental care in Bosnia and Herzegovina in 2017 (UNICEF, 2017). 49.4% of these children were in institutional care, 36.2% in kinship foster care, and only 9.2% in non-kinship foster care. 87% of children placed in the institutions were younger than three (UNICEF, 2017). Due to demanding administrative procedures, prejudices towards upbringing of someone else's child, and fear of getting attached to a child that might be taken back to biological parents, very few families provide foster care, while adoption procedures are extremely long and complicated. Therefore, many children still spend their first years of life in collective care (Opening Doors for Europe's Children, 2018). Since all available funds and efforts urgently need to be put in the deinstitutionalization process, there are practically no investments in early intervention programs for the youngest children residing in institutions.

The Children's Home where this study took place is a large public institution. Children are placed in groups of approximately ten to twelve children and two adults (one caregiver and one housekeeping staff) per eight-hour or twelve-hour shifts. In such conditions, the caregivers can take care of the children's physical needs, health and safety, but can hardly work on additional stimulation of children's development. Despite enormous efforts of the staff members to provide the best possible care to all children, a high number of children per one caregiver, high fluctuation of caregivers, and no time for individual one-to-one conversations and play-time between a child and an adult, potentially lead to structural neglect typically seen in institutional care (van IJzendoorn, 2014).

The purpose of this study was to assess the development of all children under the age of eight currently living at the Children's Home, in order to provide a baseline data for potential interventions.

Method

Sample

16 children (6 boys) participated in the study. The children differed in terms of their current age (range 1 to 7 years), the age of admission (range 2 months to 6 years), and the number of years spent in the institution (range 3 months to 7 years). All children under the age of three received regular daycare at the Home. Those older than three attended public

preschool or first-year school programs. None of the children were categorized as children with special needs.

Instruments

Developmental Behavioral Scales (DBS, Pištoljević, Zubčević, & Džanko, 2016) is a measure used for development assessment and is standardized on a representative sample of Bosnian-Herzegovinian children. Ten different scales cover the age from 1-72 months. The scales are divided into the following domains: speech/communication, motor development, cognitive development, socio-emotional development, and self-care. The Cronbach’s alpha reliability for all scales is ranging between 0.86 and 0.96, and inter-rater agreements between 88.5% and 94.8%. Items on DBS are based on objectively observable skills and behaviors, shown in a play-based test situation. The items that cannot be observed during the test situation (namely the self-help items which encompass skills such as independent eating, dressing or bathroom use) are answered by caregivers.

Developmental test Čturić (DTC, Čturić, 2007), is a measure standardized for the population of Croatian children. The child’s result is formulated as an overall development quotient. The authors report .93 and .97 test reliability of DTC (age 0-2 and age 3-8 respectively) compared with Brunet-Lézine Scale (calculated with Pearson’s correlation coefficient). Similar to the DBS, the scoring is based on observable demonstration of specific skills and behaviors.

Results

By comparing each child’s developmental status with the developmental norms typical for his or her age on both tests, we obtained the following results. As can be seen in Figure 1, the results on the DBS show that most children did not achieve minimal age-appropriate skills in language, motor and cognitive development (13, 12 and 11 out of 16 children respectively). One half of the children did not reach minimal developmental milestones in social development and self-help (8 and 7 out of 16 children respectively).

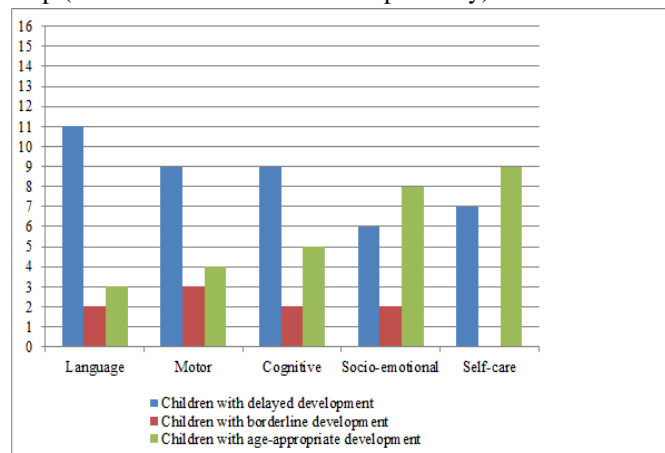


Figure 1: Number of children per category of development on the DBS

Based on the results on the DTC (see Table 1), only 3 out of 16 children have an age-appropriate development quotient.

Table 1: Number of children per category of development on the DTC

	Development Quotient (DQ) Categories		
	Age-appropriate	Borderline	Delayed
N	3	8	5
Total	16	16	16

Analysis of individual results suggests that the higher the number of years spent at the institution a And the lower the age of admittance, the bigger are the developmental delays.

Discussion

In summary, our data confirms that structural neglect, combined with pre-institutional trauma, can lead to developmental delays in all areas of development of young children (van IJzendoorn et al., 2020; Sonuga-Barke et al., 2017). Our study extends this finding to a previously uninvestigated context - that of a large public institution in Bosnia and Herzegovina.

The main limitation of our study is a very small sample, limited by the actual number of children under the age of eight placed at the Children’s Home at the moment of the study. However, it is adequate in the sense that it represents a diversity that characterizes most institutional groups of young children in the region, in terms of different life histories, different ages, different amounts of time spent in the institution, and different ages of admittance (Vasileiou, 2018). Another important limitation is a behaviorally oriented measure of emotional development, which does not capture attachment related problems typical of this population - a problem that could be solved by using attachment-based measures in future studies. Although family-based care is undoubtedly the only adequate environment for each child, our results point out a pressing need for additional stimulation to be provided for these children while waiting for more appropriate, family-based placements to become available. In countries such as Bosnia and Herzegovina, where the deinstitutionalization process has been quite slow, and foster care only scarcely available, low- or no-cost interventions should be designed in order to provide additional stimulation for each young child until the conditions are met for him or her to leave the institution. Our results were used to develop such an intervention, aiming to match each child with one dedicated volunteer, trained to deliver individually tailored, play-based activities,

thus helping the child to acquire age-appropriate skills (Tutnjević & Vilendečić, 2021).

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Material and Financial Transfers Within Informal Caregiving Dyads in Slovenia

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Abstract

Informal care, by its definition, is not (financially) remunerated, yet caretakers often provide material and financial support to their carers. While there is some evidence of financial transfers within parent-child caring dyads, extant literature lacks results on transfers to/from other members of one's social network and on differences regarding the type and intensity of care. To address this gap, we used nationally representative data from waves 6 and 7 of the Survey of Health, Aging and Retirement in Europe (SHARE). About one-tenth of participants were involved in transactional relationships (caring-receiving gifts or gifting-receiving care). They were more likely to give gifts to their carers than to other members of their social network, but the likelihood of gift-giving was independent of the type (i.e., paperwork, practical household, personal care) or intensity of care received. For older carers, receiving a large gift from caretakers was less frequent but more likely when caring was more intensive. The findings may indicate a potentially problematic subgroup of caretakers who feel obligated to "pay" for the care they receive while struggling financially. As the findings may represent only the tip of the 'transactional' iceberg, further research should also explore smaller gifts and possible protective/risk factors associated with financial expectations and feelings of guilt within caregiving dyads.

Keywords: informal caring; financial transfers; informal carers; older people; SHARE

Introduction

Informal care is defined as care of elderly and dependent persons by a person with whom a carer has a social relationship (Triantafyllou et al. 2010). It is usually provided within families, households or other close social circles and ranges from helping the caretaker with paperwork to assisting with most (or all) activities of daily living. Therefore, two main groups are usually distinguished: BADL (basic activities of daily living; e.g., help with personal hygiene; Katz et al., 1963) and IADL (instrumental activities of daily living; e.g., grocery shopping; Greenberg & McCabe, 2018; Lawton & Brody, 1969). They differ not only in terms of temporal intensity, but also in terms of (psychological) burden for caretakers and carers (Oliveira & Hlebec, 2016).

As informal care is usually not formalized, it is not financially remunerated in the form of a regular wage. However, caretakers often provide material and financial

support to their carers in the form of gifts or monetary transactions as a reward for their help (e.g., Buch, 2014; Hammer & Österle 2003).

There is some research showing that children are likely to receive financial transfers from their elderly parents when caring for them (Alessie, Angelini & Pasini, 2014; Cox & Rank, 1992; Norton, Nicholas, & Huang, 2013), but less is known about transfers to/from other members of caretaker's social network. In addition, there is a gap in extant literature regarding the likelihood of care reimbursement depending on the type (i.e., BADL, IADL) and intensity, which may vary even within the same type of care (e.g., if more than one carer cares for the same caretaker, the burden is shared among them). As older people are often financially vulnerable, transfers in exchange for care (or the perceived need to provide it) can place both financial and psychological strain on them.

In the present study, we therefore investigated how prevalent so-called transactional relationships (i.e., gifting for care; see Tomini, Groot & Tomini, 2016) are in a representative sample of Slovenian old people. Moreover, as the data we used were part of an international longitudinal study (Survey of Health, Aging and Retirement in Europe), we will compare the data with previously published results in the comparable sample.

We extend the literature in two key ways. First, we examined which carers receive gifts when they provide care. While we expect children to be the most likely recipients of financial and material gifts (in part because the close family is considered a special form of economic microenvironment with more frequent exchanges of goods and help; e.g., Leopold & Raab, 2013), we do not expect them to be the only beneficiaries of the aforementioned transactions in caregiving dyads. Second, we tested whether the likelihood of financial and material transfer is higher when caring is more intensive in terms of activities (i.e., BADL versus IADL) and regularity.

Methods

Participants and procedure

We used data from waves 6 and 7 of the Survey of Health, Aging and Retirement in Europe (SHARE; Bergmann, Scherpenzeel, & Börsch-Supan, 2019; Börsch-Supan, 2020a,b; Börsch-Supan et al., 2013). The survey was

administered using computer-assisted personal interviews by trained interviewers and included self-assessment questions as well as reporting on other household members (some questions are also directly addressed to other household members).

The nationally representative Slovenian sample included 2884 participants (38.8% men) aged 50 to 101 years ($M = 67.5$, $SD = 9.9$). Although younger participants in the sample might not be considered old in terms of developmental psychology, the entire sample was retained to ensure comparability with other studies based on SHARE data.

Measures

In the study, we focused on two sets of questions. The first focused on caring (*Did you give/receive help from outside your household over the past year?*) with follow-up questions in which participants named up to three carers/caretakers, and reported the type (paperwork, practical help, personal care) and intensity (daily, weekly, monthly, less often) of care given or received.

The other cluster related to giving and/or receiving larger gifts (*Did you give/receive a (financial) gift of € 250 or more over the past year?*). Again, participants named up to three people to whom they gave gifts or from whom they received gifts.

Results

Distribution of relationships and transfers

Based on their responses to two main questions, participants were categorized into 16 types of care/gift relationships, that group into altruistic (only giving or receiving gifts/care), transactional (caring-receiving gifts or gifting-receiving care), or reciprocal relationships (both giving and receiving either care or gifts; see Tomini, Groot & Tomini, 2016).

Almost half of the participants were not in any of the three types of relationships (not giving or receiving care, nor giving or receiving gifts). Of the remainder, 82.1% were in altruistic relationships, 7.5% were in reciprocal relationships, and 10.4% were in transactional relationships

(see Table 1).

In the total sample, 579 participants reported receiving care, and 112 of those also gave material or financial transfers (hereafter: gifts) of more than € 250 in the past year (19.3% of caretakers or 3.8% of the total sample). The majority of caretakers in transactional relationships indeed gave gifts to their carers (88.4%). Across the entire sample, these gifts accounted for more than half of all reported gifts (54.1%), and the majority of carers in the sample were also recipients of gifts (58.6%).

Most gifts in transactional relationships were given to children ($n = 80$), some to grandchildren ($n = 6$), a friend ($n = 4$), son-in-law, niece, or other relative (all $n_s = 2$), while sister, clergy, and a neighbor were all mentioned once as recipients of gifts. In addition, caretakers in transactional relationships were more likely to give to their carers than to other members of their social network ($\chi^2(129) = 445.41$, $p < .000$, $V = .58$, $p < .000$).

Transfers and types of care

With regard to the different types (i.e., paperwork, practical household, personal care) and intensity of care received by participants, the likelihood of giving within transactional relationships was not related to type ($\chi^2(2) = 2.09$, $p = .35$), but was slightly more likely when care was more intense ($r_{pb} = .08$, $p = .048$).

Compared to 58.6% of carers who received gifts from participating caretakers, receiving a material or financial transfer from their caretaker was less common among older carers (i.e., respondents who reported being carers; 25.5%). Gifts received by older caretakers accounted for 19.3% of all gifts received by participants. As with gifts given by older caretakers, older carers were more likely to receive gifts when the care they provided was more intensive ($r_{pb} = .41$, $p = .005$).

Discussion

While the results show that only a small percentage of the total population is in one of the "risky" categories, we must note that the sample included many participants who were not in any of the caring relationships. The percentages are

Table 1: The distribution of participants into different types of gifting/caring relationships

	Received a gift				Did not receive a gift			
	Received care		Did not receive care		Received care		Did not receive care	
	Cared	Not cared	Cared	Not cared	Cared	Not cared	Cared	Not cared
Gave gift	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	6	7	24	26	38	61	137	330
	0.21%	0.24%	0.83%	0.90%	1.32%	2.12%	4.75%	11.44%
Not gift	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	3	19	14	32	85	360	333	1409
	0.10%	0.66%	0.49%	1.11%	2.95%	12.48%	11.55%	48.86%

Notes: fields 1, 2, 3, 5, 6, 9, and 11 denote transactional relationships, fields 4 and 13 denote reciprocal, and fields 7, 8, 10, 12, 14, and 15 denote altruistic relationships. Participants in field 16 were not involved in any type of caring-gifting relationship.

therefore significantly higher if we consider only caretakers or if we consider the absolute numbers in the population. Moreover, the percentage of caretakers in transactional relationships appears to be increasing, and the trend is likely to continue in the future with demographic shifts in society and the changing nature of intra-family relationships (see Tomini, Groot & Tomini, 2016 for older data; Liu, Lu, & Feng, 2017).

Given that older people often struggle financially, our findings may point to a potentially problematic subgroup of caretakers who are engaged in transactional caring relationships and feel obligated to "pay" for the care provided to them, despite having few resources to do so. Equally problematic could be carers' expectations of reimbursement, and a lack of care in the absence of this. Consistent with our expectations, receiving a gift was somewhat more likely when caring was more intensive, but the likelihood of gifting/receiving was not related to the type of care. While the modest relationships may be due in part to the dichotomous nature of the responses, the relationships may also be non-linear. It is not uncommon for informal carers involved in the high-intensity care of disabled people, for example, to also manage their finances and therefore not receive gifts from them.

Older carers, on the other hand, were less likely to receive gifts, but the likelihood was more strongly related to the intensity of their care. This suggests, on the one hand, that older people are more altruistic (especially women; Eswaran & Kotwal, 2004; Tomini, Groot & Tomini, 2016), but also that reciprocal relationships outside of parent-child dyads are less common.

The data we used are not ideal for examining financial and material transfers in caring dyads, and the results may therefore be biased in opposite directions. The questions on gifts only capture gifts of more than € 250, while we assume that the majority of day-to-day reimbursements would be much smaller. The results could therefore only be considered as the tip of the 'transactional' iceberg, with smaller gifts also potentially problematic.

On the other hand, the linkage of named individuals might not be perfect for all participants (e.g., "a child" is named as a carer and "a child" is named as the recipient of a gift, but they might be different children). Also, possible economic arrangements within the family were not considered (e.g., expectation of inheritance, prior help provided by the caretaker). Further research should therefore use more direct questions, explore smaller gifts, and possible protective and risk factors related to financial expectations and feelings of guilt within caregiving dyads. Nevertheless, money - especially within families - remains a taboo subject (Furnham, & Argyle, 2008; Romo, 2011), and the data from SHARE, although limited, allowed us to observe some general patterns that may be useful in planning future research and interventions aimed at promoting informal care without undue financial and material expectations.

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The Development of Conscientiousness scale: measuring personality traits in children in middle childhood

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Abstract

The goal of this study was to develop and validate an instrument for the measurement of the trait of Conscientiousness (C), as conceptualized through the HEXACO model, but in middle childhood, children using their parents' ratings. Following a pilot study that singled out the items with the best psychometric characteristics, the main study was conducted using a final instrument on a sample of 264 children, who were rated by their mothers and/or fathers. Four facets were extracted in both mothers' and fathers' ratings, as well as a higher-order factor. Results suggest that obtained factor structures deviate to some extent from the one proposed by the HEXACO model, with certain discrepancies between factor structures extracted from mothers' and fathers' ratings. We discuss these discrepancies as well as conceptual and practical problems that might arise from attempting to measure children's personality traits.

Keywords: measuring children's personality; children in middle childhood; conscientiousness; personality traits;

Introduction

Conscientiousness (trait C) is one of the six core personality dimensions, as defined in the HEXACO personality model (Lee & Ashton, 2004). For adults, it refers to a person's propensity to maintain order, organize his/her time and environment, and to work and perform tasks thoroughly and diligently. As such, trait C is considered a crucial personality factor (Kim & Kochanska, 2019) that is implicated in various lifelong psychological and behavioral outcomes such as, but not limited to, health behavior, sexual risk-taking, academic success, job performance, and overall adaptability. This suggests that C underpins important developmental outcomes and processes that can make an impact throughout childhood, indicating a need for reliable ways to measure it in younger children. In fact, previous

research has shown that some of the characteristics of the facet-level traits of C in adults can also be observed in children (Tackman et al., 2017) – a conscientious child is committed to completing obligations on time (Eisenberg et al., 2012) and is characterized by prudence and tidiness (Lee & Ashton, 2004). However, assessment of personality in children comes with an additional challenge when it comes to the nature of measurement. Self-report measures can be relatively restricted at a young age, with most of them being picture-based (e.g. Maćkiewicz & Ciecuch, 2016), with limited sets of items, and limited variability of behaviors and indicators they encompass. Consequently, one solution is to employ rating measures as a more appropriate method of assessment in younger children.

Aim of the study

The overall goal of the study was to develop a conscientiousness rating scale for children in middle childhood and examine its psychometric and construct validity. Additionally, we wanted to compare its latent structure to the expected theoretical content of the HEXACO trait C. Finally, we wanted to inspect the diagnostic validity of the rating scale in its ability to predict gender differences, given that previous research suggests their existence (Lee & Ashton, 2004; Matthews et al., 2009).

Method

Instrument

DOK-C The final instrument ($\alpha = .93$) consists of 40 items, with 10 items mapping each of the four facets of HEXACO C – Organization, Diligence, Perfectionism, and Prudence. Participants rate their children by indicating their agreement

with statements on a dichotomous (yes/no) scale. The items were selected based on a pilot study (N = 104, 87.5% mothers), where 83 items were assessed based on IRT model reliability, fit, separation, and item difficulty.

Sample

The sample was convenient, with a total of 264 children (58% girls) evaluated by 215 mothers ($M_{age}=42$, $SD_{age}=4.83$) and 125 fathers ($M_{age}= 41$, $SD_{age}=5.08$). There were 76 parenting couples rating the same child. Children were aged 7 (29%), 8 (49%), and 9 (22%) ($M_{age}= 7.85$, $SD_{age}=0.7$). The sample was collected in two elementary schools in Belgrade, Serbia.

Results

Factor analyses

EFA was conducted separately on mothers' and fathers' ratings, using the ML method with Promax rotation. In both cases, the values of the Kaiser-Meyer-Olkin and Bartlett's sphericity test were satisfactory (mothers: $KMO=.825$, Bartlett's sphericity test $\chi^2 = 2944.413$, sig $<.01$; fathers: $KMO (.819)$, Bartlett sphericity test $\chi^2 = 2300.191$, sig $<.01$). In the mothers' subsample, Horn's parallel analysis suggested that 4 factors should be retained, while for the fathers' subsample Horn's criteria suggested a three-factor solution. However, after inspection of factor loadings, it was decided to keep the four-factor solution, which had a clearer differentiation of factors and better interpretation potential.

The first factors explained the highest proportion of variance in both mothers' (19.89%) and fathers' ratings (26.66%). Factor intercorrelations were positive and moderate both in mothers' ($r=.231 - .516$) and fathers' ($r=.332 - .581$) ratings data. A higher-order factor emerged in both groups and was labeled as Conscientiousness. To estimate the similarity of the factors extracted from mothers' and fathers' ratings orthogonal Procrustes rotation was done. Congruence was 1.0, while for facets estimates were .67 (Organization), .87 (Diligence), .70 (Perfectionism), .75 (Prudence), which suggested factors were fairly similar, but with certain deviations.

The latent structure of the scale deviates from the one proposed by the HEXACO model to some extent. Items constructed to reflect the facets of Diligence and Prudence were redistributed differently in the mothers' and fathers' ratings as to form factors of *Effortful Control* and *Task Persistence* on one side (mothers' data), and *Responsibility* and *Obedience* on the other (fathers' data). Organization and Perfectionism on both mothers' and fathers' data resembled the original facets of the HEXACO model.

The diagnostic validity

Diagnostic validity of the scale was tested with CDA (Table 1). One statistically significant discriminant function was obtained, suggesting there are differences in the way mothers and fathers rate girls and boys on the C dimension.

The fathers' ratings showed a greater difference between rated Conscientiousness of boys and girls, while both mothers and fathers tended to rate girls higher on the dimension as a whole, with centroids for girls in both samples being positive as opposed to the boys'. The proportion of variance of differences between boys and girls explained by a linear combination of isolated factors was not large in either of the subsamples (fathers' subsample – 18.06%; mothers' subsample – 7.61%).

Table 1: Significance of discriminant function, canonical correlation, and centroids

	Wilks' Lambda	Canonical correlation	Centroids for girls	Centroids for boys
mothers' data	.924*	.276	.271	-.301
fathers' data	.819*	.425	.420	-.517

Discussion and Conclusion

The results indicate that the newly developed instrument showed sound factorial validity overall. However, some discrepancies between the expected and empirical latent structure did emerge. It is possible to assume that these discrepancies stem from the fact that personality traits, while evidently present in children, are still not sufficiently differentiated as to form clear cut facet level factors, resulting in an unstable factor structure in different parents' subsamples. This is in line with the temperamental framework of personality development where constructs such as voluntary control (Rothbart & Rueda, 2005), task persistence (Karnes et al., 2005), and dedicated obedience (Kochanska, 1993), which can be considered the basis of the latter trait C in adults (Tackman et al., 2017), most often encompass a wide range of behaviors, from which different facets of C and other personality traits are later differentiated.

Moreover, results imply that parents could be evaluating their children differently which is reflected in the somewhat divergent nature of the factors that emerged on fathers' and mothers' subsamples – fathers seem to pay more attention to child's obedience, while mothers are more oriented to outcomes of solving tasks. This may generally indicate that fathers have a greater role in disciplining the child, while mothers are more involved in education and teaching. Nevertheless, there seems to be evidence of Conscientiousness as early as the age of 7, especially the facets of Organization and Perfectionism, which emerged both in mothers' and fathers' ratings. The reason behind the stability of these two facets may be the fact that they include specific behavioral manifestations that are easier to observe from the outside.

In conclusion, while both conceptual and practical problems in measuring children's personality traits do arise,

developing rating scales within the established personality models can help us understand how the structure of the trait changes during development.

Given the potentially unstable nature of the structure of personality in children, a pathway for future studies might be to employ such scales in a longitudinal design, in order to better understand how and when personality traits start to differentiate.

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Socio-demographic characteristics and school achievement of high school students as correlates of the internet addiction index

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Abstract

Due to the apparent increase in Internet addiction (IA) among young people, it is relevant to examine this problem, especially in an area where research on this topic has not been done so far. This research aims to investigate some correlates of internet addiction among high school students. Previous studies have not revealed gender differences, however, it has been found that students with high economic status are more likely to develop some form of Internet addiction. A total of 110 students from Pasjan participated in the study (of which 23.6% were boys). Internet Addiction Test - IAT was used to measure the level of Internet addiction. The results did not show gender differences, nor the impact of family economic status on IA level. Findings related to the association between school achievement and IA levels were confirmed, where those high school students with better school achievement had a lower level on a scale that measures Internet dependence.

Keywords: internet addiction; high school students; economic status; school success; gender

Introduction

Internet addiction (IA) is one of the current topics in the last few years because of to the increasing use of the Internet, especially among young people (DuFour & Reeves, 2016).

Internet addiction, as defined by Widyanto and McMurrin (2004, according to Bodroža & Jovanović, 2015) is a form of behavioral addiction, because it does not involve the introduction of a substance into the body, which is why Young (1996, according to Bodroža & Jovanović, 2015) compares it with pathological gambling. In the scientific circles of American psychiatrists, there is a tendency to include internet addiction in the new American classification of mental illnesses, DSM-V, under the category of cyber disorder (Huang & Alessi 2005, according to Bodroža & Jovanović, 2015).

Criteria for diagnosing this disorder, proposed by the American Psychiatric Association, include (Bodroža & Jovanović, 2015):

- Internet occupation,
- the need to increase the time spent in this activity in order to achieve satisfaction (developing tolerance),
- withdrawal symptoms (irritability, anxiety, mood swings) when activity is disabled,
- spending more time in virtual activities than planned,
- unsuccessful attempts to reduce the time spent on the Internet,
- using the Internet as an escape from negative feelings or problems,
- neglect of social, professional or family activities.

Some research has indicated that there is no difference, among adolescents, in the severity of internet addiction and gender, (Dufour et al, 2016). Research on Turkish high school students showed that signs of Internet addiction is more common among children of higher economic status (Kayri & Günüç, 2016), and that students with better school performance had a lower level on the scale that measures Internet addiction (Türel & Toraman, 2015).

The study is aimed to examine socio-demographic characteristics (gender, success in school and socioeconomic status), as correlates of the internet addiction index.

In order to examine the relationship between internet addiction and socio-demographic variables, the following hypotheses were tested in adolescents:

H1: There is no statistically significant difference between the Internet addiction scale and the gender of adolescents, according to previous researches (Dufour et al, 2016).

H2: There is a statistically significant negative correlation between Internet Dependence scale and school success, according to previous researches (Kayri & Günüç, 2016).

H3: There is a statistically significant correlation between Internet Addiction scale and the socioeconomic status of the family, according to previous researches Türel & Toraman, 2015).

Method

The research included 110 students from high schools, Gymnasium and Medical School in Pasjan, Gjiilan municipality (which is 80% of the total number of students), aged between 14 and 18, of which 23.6% were men and 76.4% girls.

Scale

Internet addiction was tested through the Internet Addiction Test (IAT) (Young, 2011), containing 20 items of the Internet Addiction Test (IAT), with answers on a six-point Likert-type scale, from 0 - never to 6 - always. The scale has satisfactory reliability of 0.82, measured by the Cronbach alpha reliability coefficient.

For the needs of the research, a questionnaire was made, which in the first part contained socio-demographic questions, which later served as independent variables (gender, school success, and socio-economic status).

The variable socio-economic status was operationalized through a question on which students assessed the

socioeconomic status of their family as low, medium, or high

As the scale distributions are statistically significantly different from the normal one ($p < 0.01$), nonparametric techniques were used, i.e. Spearman's R_o correlation coefficient and Man-Whitney U test

Research results

The analysis of the results of the data obtained in the research on a sample of 110 adolescents aged 14 to 18 on the use of the Internet, i.e. on the manifested form of addiction, showed that the score on the IAT scale ranges from 2 to 71, with an average value of 31.45 ($SD = 13.76$), which belongs to the medium-low level based on the scale key given by Young (Young, 2011).

Table 1: Descriptive statistics

minimum	maximum	mean	SD ²
2	71	31.45	13.76

There is no statistically significant difference between boys and girls regarding their score on IAT scale. ($U(110) = 925.50, p > 0.05$)

A statistically significant, low, correlation was obtained between the Internet addiction scale and school grades and it is negative. ($\rho(110) = -0.23, p < 0.05$).

Students with a higher score on the Internet addiction scale (those who show a higher propensity for Internet addiction), have worse school performance.

Statistically significant correlation between of the Internet dependence scale and socioeconomic status were not detected ($\rho(110) = 0.06, p > 0.05$).

Discussion and conclusion

Recognizing the growing trend of increasing Internet addiction in adolescents (Bodroža & Jovanović, 2015), this study sought to examine the statistically significant relationship and differences between the scale Internet Addiction and socio-demographic variables. The research was conducted on a sample of 110 adolescents aged 14 to 18 years.

The obtained score of the IAT scale, whose mean value is 31.45, where the theoretical maximum of the scale is 100, shows that Internet dependence in adolescents from the sample is medium-low level based on the scale key given by Young (Young, 2011), i.e. that they do not show symptoms of Internet dependence. The results showed that there are no differences by sex ($U(110) = 925.5, p > 0.05$), which is consistent with the initial hypothesis, i.e. confirms the first hypothesis (H1) and is consistent with some of the previously conducted research (Dufour et al, 2016) .. Furthermore, there was a statistically significant

correlation between school achievement and the score on the Scale expression of Internet Addiction ($\rho(110) = -0.23, p < 0.05$), which confirmed the second hypothesis (H2). In accordance with our assumption and previously conducted research (Türel & Toraman, 2015). Students with higher achievement show a lower level of dependence. The relationship between socioeconomic status and IAT scores did not prove statistically significant ($\rho(110) = -0.06, p > 0.05$), which rejects the initial third hypothesis of the conducted research (H3) and is not in line with the research of Kari and Grunik (Kayri & Güniç, 2016).

The absence of gender differences in the level of expression of the Internet addiction scale suggests that in the prevention of this disorder, equal attention should be paid to both sexes. Students with lower school achievement have a more pronounced tendency to develop Internet Addiction and they represent a vulnerable population. On the other hand, the economic status of the family has not proven to be a significant risk factor, which can be explained by the fact that the Internet is increasingly becoming available globally, through all segments of society (through mobile devices and home internet packages). Another explanation for not obtaining statistically significant differences can be found in the sample structure or size (in terms of gender) or the nature of the question (in terms of socio-economic status), as it is a subjective assessment of family socio-economic status created by adolescents.

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² Standard deviation

Adolescents' Leisure Activities: Types of Social Networks and Specific Hobbies

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Abstract

Previous findings from a broader study about adolescents' leisure activities in Serbia show that few adolescents pursue hobbies, while online social networks (OSNs) usage is widespread. Results also suggest that two types of OSNs could be distinguished: (1) oriented towards personal communication and exchange (e-mail, Viber, WhatsApp, Skype, & Snapchat); (2) reflects presence in the public domain, and is used to provoke a reaction (YouTube, Twitter, Instagram, Facebook). This work aimed to determine if there are connections between certain hobbies (8 distinguished) and mentioned OSNs. On 17 items selected in the applied questionnaire, adolescents estimated how often they engage in specific hobbies and how active they are on mentioned OSNs. Results indicate that some hobbies do not require activity on OSNs at all, while some are connected to particular (types of) OSNs. Different types of OSNs, according to their capacity for personal exchange and public exposure and reaction, could be upholding for practicing different hobbies, especially graphic design and computer-related activities. OSNs might also represent a supportive tool in practicing hobbies, concerning the nature of the specific hobby-related activity and purpose, mostly because hobbies and OSN activities are chosen following adolescents' interests, abilities, knowledge, and resources.

Keywords: adolescents; leisure; types of social networks; hobbies; positive youth development.

Introduction

Leisure activities play an important role in adolescents' positive psychological development. Using social media is one of the most preferred activities (Jimenez, 2017), while adolescents' engagements in hobbies and other earnest leisure activities are low (Pešić, Videnović, & Plut, 2014; Davidović, Vuletić, & Krnjaić, 2017).

There are different patterns of adolescents' socio-digital participation. Li and collaborators (2016) distinguished three groups: basic (social), gaming-oriented, and creative participators. Previous empirical findings concerning adolescents in Serbia propose two types of *online social networks (OSNs)* for consideration, according to the direction of communication and adolescents' socio-cultural appearance (Vuletić & Krnjaić, 2019a). The first type is oriented towards personal communication and exchange (e-mail, Viber, WhatsApp, Skype, and Snapchat), while the second refers to adolescents' presence and activity in the public domain (YouTube, Twitter, Instagram, Facebook).

Hobbies differ according to their mental activation capacity and can be more or less creative, private, or public. In general, they should be defined as voluntary, intrinsically motivated, mainly individual activities, pursued continually

in leisure time, requiring a significant level of skill, knowledge, and experience (Krnjaić, 2019; Stebbins, 1997). Therefore, hobbies tend to fulfill diverse functions, such as relaxation, entertainment, research, interest accessibility, ability/talent/skill development, knowledge acquisition, identity building, self-expression, and personality development.

Still, few adolescents pursue hobbies. Regardless of their significant developmental potential, hobbies do not represent the subject of numerous studies, especially not related to online social networks (OSNs).

Aim of the study

The arising research question refers to the nature of the relationship between adolescents' engagement in various hobbies and their widespread inclination to the OSNs.

Therefore, this work aims to determine if there are connections between certain hobbies and specific OSNs, which reflect two distinguished types.

Method

This research is a part of the broader study about the everyday life of adolescents in Serbia. In total, 17 items were selected from the applied questionnaire. Students estimated how often they tend to engage in specific hobbies and answered how active they are on OSNs.

Sample

The sample included 1358 secondary school students, 61.8% from the secondary vocational schools (3 and 4 years), and 38.2% from the gymnasium. 51.3% of students were in the first year, others in the third. 56% are girls.

Instruments

Questionnaire regarding adolescents' leisure time. Among other questions in the applied questionnaire, adolescents were asked to:

1. Estimate (on Likert-type scale, 1-5) how often they engage in specific hobbies, i.e., creative activities³: blog writing, creative writing, drawing/painting, graphic design, composing/playing music, making jewelry/clothes, computer-related activities (programming), as well as the artistic photography. The main item: „Do you, in the course

³ This scale was modified according to the explanation in the previous research (Vuletić & Krnjaić, 2019b). The outcome resulted in the binary variables for the hobbies.

of your leisure time, engage in some hobbies or activities that have a creative character?"

2. Answer (on Likert-type scale, 1-5) how active they are on the following OSNs: e-mail, Viber, WhatsApp, Skype, Snapchat, YouTube, Twitter, Instagram, as well as Facebook. The main item: „How often do you use computer/tablet/cell phone for the following purposes?"

Results

The most represented adolescents' OSNs are YouTube and Instagram, while the least represented are Twitter, E-mail, and Skype, as seen in Table 1.

The main results are shown in Table 2. Positive correlations are found between specific hobbies and OSNs: writing & Twitter; blog & Snapchat; photography & Instagram, Snapchat; graphic design & Twitter, Skype; computer-related activities & Twitter, Skype.

Table 1: Frequency of the activity on OSNs

Frequency of usage	OSN								
	Mail	Viber	W-App	Skype	Snapchat	YT	Twitter	Insta	FB
(Almost) never	46.9	39.8	41.5	69.3	52.8	1.4	85.1	9.3	27.3
1-2 times a week	36.6	22.1	9.6	15.8	12.5	3.0	6.0	3.9	24.1
Up to 1 h a day	8.3	17.8	12.8	5.3	12.4	12.1	2.9	12.3	22.8
> 1 h a day	8.2	20.3	36.1	9.6	22.3	83.5	6.0	74.5	25.8

Table 2: The point-biserial correlations of engagement in hobbies and activity on OSNs

OSN	Hobbies							
	Blog	Writing	Drawing	Design	Music	Jewelry	Computer	Photo
E-mail				.143**			.207**	
Viber					-.057*			
WhatsApp				-.087**			-.092**	
Skype	-.055*			.098**		-.065*	.131**	
Snapchat	.066*						-.090**	.067*
YouTube								
Twitter		.065*		.065*			.089**	
Instagram			-.077**	-.055**			-.119**	.055*
Facebook			-.065*					-.093**

* $p < .05$, ** $p < .01$

These correlations are extremely low. Nevertheless, computer-related activities and graphic design realize more steady connections with the E-mail. On the other hand, scores on drawing, practicing music, and making clothes and jewelry have no positive correlations with considered OSNs, whatsoever.

Independent sample t-tests confirm these connections, implying that adolescents who engage in hobbies from the previous paragraph might have positive tendencies towards the corresponding OSNs. Likewise, most of these effects are

very small (*Cohen's D* < .20), except for the graphic design (Skype, E-mail, Twitter) and computer-related activities (Twitter, Skype), which achieve slightly bigger small-size effects (.23 < *Cohen's D* < .39). The only steady and medium connection appeared between E-mail and computer-related hobby (*Cohen's D* = .54).

Discussion & Conclusion

Generally, the connections between hobbies and the use of OSNs are weak, but certain specificities concerning their nature occur indeed. Some hobbies might be involved with specific (types of) OSNs, while others show no significant relationships with them.

Therefore, writing is only and barely connected to Twitter, hence the second type of OSNs. This result is expected, since writing requests articulation and public affirmation, potentially provided by Twitter. Intuitively, this should be more characteristic for blogging, which is, in contrast, positively connected only to Snapchat. Seemingly, bloggers might use more public platforms that are not necessarily encompassed by this research.

Graphic design and computer-related activities stand out with higher correlations, simultaneously sharing a similar "profile." They use E-mail, Skype, and Twitter, spending less time on WhatsApp and Instagram. Adolescents' engagement in these hobbies might represent a part of the preparation for formal studies and professional activities, regardless of the predominant type of OSNs.

Adolescents who practice photography seem to prefer more personal communication. However, they probably need a platform such as Instagram to present their work. Thus, photography could also be considered an introduction to reviewing hobbies as a professional opportunity.

Obtained negative relations indicate that adolescents who practice drawing, music, and jewelry/clothes making do not spend much time using these specific OSNs. As for drawing, the results could be interpreted following the previous findings that adolescents who draw and paint tend to feel lonesome (Vuletić & Krnjaić, 2019b).

In conclusion, different types of OSNs, according to their capacity for personal exchange and public exposure, could uphold the practice of various hobbies. One should bear in mind the small effect sizes obtained in this research, representing its core limitation. Additionally, it remains unresolved how adolescents use OSNs for hobbies and how much of the OSN resources they spend on creative vs. leisure or consuming activities.

OSNs could represent a supportive tool in practicing hobbies, concerning the quality of the specific hobby-related activities and purpose. This happens mostly because hobbies and OSNs are chosen according to the adolescent's interests, abilities, knowledge, and resources. However, the nature of the specific activity seems to be more relevant than the type of OSNs, so the recommendation for future research is to develop more refined measures and focus on a qualitative approach.

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Corporal Punishment in Childhood and Aggressiveness as Predictors of the Corporal Punishment Approval

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Abstract

It is suggested that favorable attitudes towards the corporal punishment of children (CP) can be transferred from generation to generation, as parents who experienced frequent CP themselves tend to endorse CP and use it with their own children, who then tend to exhibit more aggressive conflict resolution strategies with their peers. This implies that CP can cause more aggressive behavior, as it signals to children that hitting is an acceptable way of dealing with conflict. Under this assumption, we wanted to test how both the CP in childhood and the levels of adult trait aggressiveness predict the approval of CP and if the link between the childhood CP and the approval of CP is mediated through trait aggressiveness. The sample comprised 390 participants from the Republic of Serbia and the Republic of Srpska. Results show that higher CP in childhood is associated with the higher levels of aggressiveness, i.e., higher anger, vengeance, dominance, and hostility. Higher CP in childhood, higher vengeance, and higher age predicted higher approval of CP. There was a significant indirect effect of higher CP in childhood predicting higher approval of CP through higher vengeance. These results are consistent with the intergenerational cycle of violence hypothesis.

Keywords: intergenerational cycle of violence; corporal punishment; approval of corporal punishment; aggressiveness; vengeance

Introduction

Corporal punishment (CP) of children remains a very common disciplinary practice, despite the research consistently linking it to various detrimental child outcomes (Gershoff & Grogan-Kaylor, 2016). According to the intergenerational cycle of violence hypothesis, favorable attitudes towards CP can be transferred from generation to generation, as parents who experienced frequent CP themselves tend to endorse CP and use it with their own children (Simons & Wurtele, 2018). Their children, in turn, tend to use more aggressive conflict resolution strategies with their peers (Simons & Wurtele, 2018). It is implied

here that CP can cause more aggressive behavior, as it signals to children that hitting is an acceptable way of dealing with conflicts. Note that causality of this relationship cannot be fully gauged, and it is a subject of a disagreement among the authors (Gershoff & Grogan-Kaylor, 2016). Some argue that CP likely does not cause aggression, rather that more aggressive children tend to receive more CP, i.e., aggression \rightarrow CP hypothesis (Ferguson, 2013; Larzelere et al., 2004). However, consistent with the opposite, CP \rightarrow aggression hypothesis, data shows that when the early age aggression and misbehavior levels are controlled for, use of CP predicts an increase in child aggression at later age, i.e., regardless of the initial child's aggression, use of CP predicts an increase in aggression later on (Berlin et al., 2009; Lee et al., 2013; Taylor et al., 2010).

Links between the history of being corporally punished and adult aggressive tendencies (Gershoff & Grogan-Kaylor, 2016) and between the adult dispositional aggressiveness scores and favorable attitudes towards the CP (Subotić, 2017) have been documented in the research.

Starting from the CP \rightarrow aggression hypothesis, the goal of this research was to test how both the CP in childhood and the levels of adult trait aggressiveness predict the approval of CP. Due to previously established bivariate links between these variables, we were also interested in testing the hypothesis that the correlation between being corporally punished and approving of the CP could be partially mediated by the levels of trait aggressiveness.

Method

Sample and procedure

Focusing the research on the Serbian culture, we draw our sample from both the Republic of Serbia (49.7%) and the Republic of Srpska (50.3%). We pooled a convenience sample of 390 (82.3% females) mostly young adult

(*Min*=18, *Max*=40, *M*=25.50 (*SD*=6.46) years of age) participants of heterogeneous educational levels. 25.6% of the participants were parents of at least one child.

Data was collected anonymously via an online survey. Analyses were done in SmartPLS 3.2.8 (Ringle et al., 2015)

Measures

The frequency of CP in childhood was measured by three questions referring to how often the participant was corporally punished by mother, father, and compared to other kids in the neighborhood.

The approval of CP was measured by three questions, referring to the intent to use CP on one's own kids, approval of using belts or rods for CP, and considering spanking to be 'perfectly normal'. Both CP frequency and the approval questions are shown in Figure 1.

Trait aggressiveness was measured by four AVDH (Dinić, et al., 2014) questionnaire dimensions: anger, vengefulness, dominance, and hostility. The AVDH questionnaire was developed and validated in the Serbian culture.

Results

Structural mediation PLS model is shown in Figure 1. Due to sociodemographic sample imbalances, we included the number of children, work status, country of living, socioeconomic status, and the level of education as the predictors of the approval of CP. Out of all of these covariates, only the country of living has a marginally significant effect. Specifically, participants from Serbia, compared to the Republic of Srpska, show slightly lower approval of CP.

Due to potential confounding effects of both age and gender (e.g. older participants and males being corporally punished more frequently, and possibly having more favorable attitudes towards CP), we adjusted for these variables on both the CP in childhood (i.e., predictor) and the approval of the CP (i.e., criterion).

The results show that, in total, predictors explain 22.8% approval of CP's variance. Experiencing higher CP in childhood predicts increases in every aggressiveness dimension, while higher CP in childhood, older age, and higher vengefulness predict higher approval of CP. Most importantly, there is a significant indirect effect of higher CP in childhood predicting higher approval of CP through higher vengefulness.

Due to pronounced convenience sampling bias towards women, we split the data by gender and bootstrapped the differences of every effect (excluding gender) shown on Figure 1, to establish if there are any gender moderated paths. The only effect that showed an indication of being moderated by gender is the Dominance → Approval of corporal punishment path: $\Delta\beta = -.417$, $\Delta p = .037$. Even though the effect was not significant for either women ($\beta = -.081$, $p = .281$) or men ($\beta = .336$, $p = .088$), on male subsample it did approach significance and it was positive.

Discussion

The results of this study are consistent with the intergenerational cycle of violence (Simons & Wurtele, 2018) and CP → aggression hypotheses (Berlin et al., 2009; Lee et al., 2013; Taylor et al., 2010). Our findings suggest that more CP in childhood is associated with the higher trait aggressiveness and that both CP in childhood and some aspects of trait aggressiveness (i.e., vengefulness), can lead to more approval of the CP in adulthood.

Furthermore, the effect of childhood CP on the approval of the CP is partially mediated through higher aggressiveness, namely – vengefulness. In other words, people who were regularly corporally punished tend to support the CP partially because experiencing frequent corporal punishment could increase their vengefulness, which, in turn, could make them more inclined to support 'aggressive' disciplinary practice, such as CP. Vengefulness have already been shown as the notable predictor of favorable attitudes towards the CP (Subotić, 2017). Being corporally punished as a child can arguably both 'normalize' the aggression in interpersonal relations and help accumulate resentment, which is then projected and directed towards one's own children.

There are some indications that dominance can also play a role in increasing the support for corporal punishment in males, but this effect is speculative due to gender sample imbalance and it requires replication and further examination on a larger sample size.

The correlational and retrospective design of this study prevents us from actually 'proving' the proposed causality. While there are data and authors suggesting so (Berlin et al., 2009; Gershoff & Grogan-Kaylor, 2016; Lee et al., 2013; Taylor et al., 2010), from our study specifically we cannot claim with any degree of certainty that aggression → CP hypothesis is 'incorrect' and that CP → aggression hypothesis is 'correct'

However, assuming that the latter hypothesis, in fact, is correct, the obtained effects are consistent with the notion that childhood CP could facilitate the development of more aggressive, i.e., vengeful adults, who then look favorably towards the CP, both because their past upbringing experiences (which 'normalize' the CP) and current vengeful personality dispositions.

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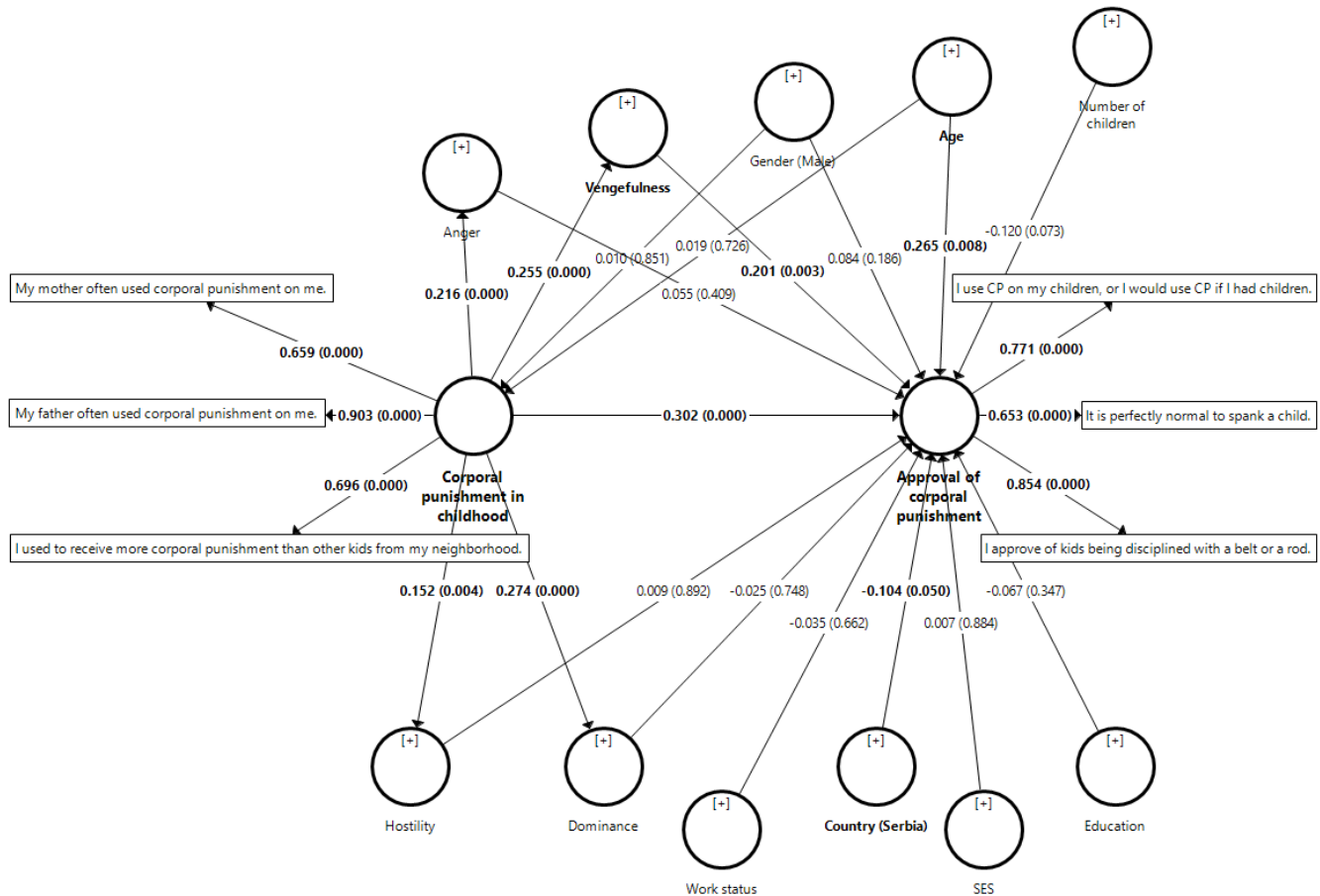


Figure 1: Structural PLS model predicting Approval of corporal punishment ($R^2=.228$, $f^2=.295$). Values are given as: $\beta(p)$, with bootstrapped ($k=10000$) sig. paths bolded. Significant indirect effect: Corporal punishment in childhood \rightarrow Vengefulness \rightarrow Approval of corporal punishment: $\beta=.051$, $p=.019$.

WORK PSYCHOLOGY

Job Satisfaction and Organizational Citizenship Behaviour: Moderating Role of Organizational Justice

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Abstract

Organizational Citizenship Behavior is individual behaviour that is discretionary, not explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization. The aim of this study was to determine whether the relationship between Organizational Citizenship Behavior and job satisfaction are moderated by organizational justice. The sample consisted of 315 employees (51,75% male). We used the Organizational Citizenship Behaviour Questionnaire, Job Satisfaction Survey, Organizational Justice Scale. Results of moderation analysis showed that, among employees with low and moderate level in perceived organizational justice, job satisfaction has no statistically significant effect on Organizational Citizenship Behavior. But among employees with a high level in perceived organizational justice, Organizational Citizenship Behavior increases with increasing job satisfaction. This study revealed that the relationship between job satisfaction and Organizational Citizenship Behavior is not straightforward and that it depends in part on the perceived organizational justice. In particular, Organizational Citizenship Behavior significantly increases with increasing job satisfaction only in employees with a high level in perceived organizational justice.

Keywords: Organizational Citizenship Behaviour, job satisfaction, organizational justice, moderator

Instruction

Organizational Citizenship Behaviour (OCB) represents „individual behaviour that is discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization“ (Organ, 1988, pp. 4). OCB facilitates the coordination of operations within the organization, improves employee productivity, enhances organizational performance stability and provides more effective organizational adjustment to changes in the organization's environment (Organ, Podsakoff, & McKenzie, 2006). Therefore, understanding the determinants of OCB is important for identifying intervention strategies aimed at enhancing employees' OCB.

Job satisfaction is the cognitive, affective and evaluative response of an individual to his or her job (Grinberg, 1998). The results of meta-analyses (e.g., Judge et al., 2001; Organ & Lingl, 1995; Organ & Ryan, 1995) have shown that there is a significant positive relationship between job satisfaction and OCB. Employee satisfaction leads to extra-role behaviours in an organization such as developing oneself, helping others and making constructive suggestions which are part of OCB.

Organizational justice is an individual's perception of fairness of treatment received from an organization and his behavioural reaction to such perceptions (James, 1993). Studies have shown that organizational justice is in a significant relationship with job satisfaction. Employees who feel that they were not being fairly treated by the organization, experience a decrease in job satisfaction (McFairlin & Sweeney, 1992; Tremblay & Roussel, 2001). Also, studies have shown that there is a significant relationship between organizational justice and OCB (e.g., Chegini, 2009; Cohen-Charash & Spector, 2001; Konovsky & Folger, 1991). Organizational injustice leads to less cooperation with co-workers and decreases the quality of cooperation. So, studies show that OCB of employees is more likely when employees are satisfied with their jobs and when they feel that they are being treated fairly by the organization.

However, the results of some studies (e.g., Mirković, 2016; Organ et al., 2006) suggest that the employees' attitudes toward work, such as job satisfaction, have a stronger effect on OCB than the organization's characteristics, such as organizational justice. And that the effect of an organization's characteristics on OCB is realized indirectly through employees' attitudes towards work. Accordingly, this study aimed to determine whether the relationship between OCB and job satisfaction are moderated by organizational justice. We predicted that OCB would increase with increased job satisfaction if employees had a high level of perceived organizational justice.

Method

Participants and Procedure

Participants were 315 employees (51,75% male) in small and medium-sized enterprises (50,9% in state-owned organizations) from Banja Luka, aged 19 to 69 ($M = 33.76$, $SD = 10.64$), with a length of service from 1 to 40 years ($M = 10.15$, $SD = 9.44$). Participants' level of education ranged from elementary school degree (3.4%), two- or three-year school degree for skilled or highly skilled workers (6,6%), high school degree (32.6%), college degree (6.3%) to a university degree (51.1%).

Data collection was performed through the paper/pencil method, in organizations in which respondents worked. Completing the questionnaire was conducted individually. Participation was on a voluntary and anonymous basis.

Instruments

Organizational Citizenship Behaviour Questionnaire (Coleman & Borman, 2000). The questionnaire consists of 27 five-point Likert-type items that measure interpersonal citizenship performance, organizational citizenship performance and job/task citizenship performance. In this research, we used a total score which had acceptable internal consistency: $\alpha = .91$.

Job Satisfaction Survey (Spector, 1985). The questionnaire consists of 36 six-point Likert-type items that measure employee satisfaction with pay, promotion, supervision, fringe benefits, contingent rewards, operating conditions, co-workers, nature of work and communication. In this research, we used a total score which had acceptable internal consistency: $\alpha = .90$.

Organizational Justice Scale (Colquitt, 2001). The scale consists of 20 five-point Likert-type items that measure procedural, distributive, interpersonal and informational justice. In this research, we used a total score which had acceptable internal consistency: $\alpha = .92$.

Results

Table 1 shows descriptive statistics and bivariate correlation for all variables in the study.

Table 1: Descriptive statistics and correlations

Scale	<i>M</i>	<i>SD</i>	<i>Sk</i>	<i>Ku</i>	Correlations	
					OCB	JS
OCB	98.46	7.89	-.45	1.79		
JS	109.68	18.53	-.08	.81	.32***	
OJ	66.40	13.93	-.25	-.14	.32***	.71***

Note. OCB - Organizational Citizenship Behaviour, JS - Job Satisfaction, OJ - Organizational Justice

*** $p < .001$

Bivariate correlations between the OCB, job satisfaction and organizational justice are positive and of moderate intensity, while the correlation between job satisfaction and organizational justice is positive and strong intensity (Cohen, 1988).

When OCB was used in the hierarchical regression analysis as a criterion and job satisfaction and organizational justice were used as predictors, the results show that job satisfaction explains 8.2% of OCB's variance ($F(1,317) = 28.289, p < .001; \beta = .286, p < .001$). Introducing the organizational justice results in a significant increase in the amount of explained variance of the OCB ($\Delta R^2 = .029, F(2,316) = 19.630, p < .001; \beta = .237, p < .001$), but also in a decrease in the standardized regression coefficient of job satisfaction ($\beta = .120, p > .05$). The amount of explained variance of the OCB has increased significantly ($\Delta R^2 = .054, F(3,315) = 20.651, p < .001$;

$\beta = .234, p < .001$) by introducing the interactive effect of job satisfaction and organizational justice. The analysis was conducted with centred predictor variables. Results show that organizational justice is a significant moderator in the relationship between job satisfaction and OCB. This moderation pattern was tested with Hays' (Hayes, 2013) "Process" SPSS macro and the results are shown in Figure 1.



Figure 1: The moderating role of organizational justice in the relationship between job satisfaction and OCB.

Results showed that, among employees with low ($\theta_{(X \rightarrow Y)|M=54.00} = -.059, t(315) = -1.019, p = .309$) and moderate ($\theta_{(X \rightarrow Y)|M=67.00} = .079, t(315) = 1.630, p = .104$) level in perceived organizational justice, job satisfaction has no statistically significant effect on OCB. But among employees with a high level in perceived organizational justice, OCB increases with increasing job satisfaction ($\theta_{(X \rightarrow Y)|M=79.00} = .206, t(315) = 3.688, p = .000$).

Discussion and conclusion

The obtained results are consistent with the results of previous studies (e.g. Judge et al., 2001; Organ & Lingl, 1995; Organ & Ryan, 1995; McFairlin & Sweeney, 1992; Tremblay & Roussel, 2001; Chegini, 2009; Cohen-Charash & Spector, 2001; Konovsky & Folger, 1991), showing positive relationships between job satisfaction and organizational justice with OCB.

Further, this study revealed that the relationship between job satisfaction and OCB is not straightforward and that it depends in part on the perceived organizational justice. In particular, OCB significantly increases with increasing job satisfaction only with employees who have high levels of organizational justice experience. This finding is consistent with the findings of previous studies (e.g. Mirković, 2016; Organ et al., 2006) which showed that an organization's characteristics, such as organizational justice, significantly affect OCB through employees' attitudes toward work, such as job satisfaction.

Based on the results of the present study, it can be concluded that an organization needs to ensure the practice of organizational justice so that it can create confidence

among the employees. This will then influence workers' job satisfaction that results in high OCB.

The OCB of employees is important to the performance and success of the organization (Organ et al., 2006). Understanding the determinants of OCB is helpful in order to promote OCB in organizations.

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Relation between Job Characteristics, Organizational Climate and Individual and Team Engagement in the Service Sector

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Abstract

The aim of this research was to analyze the relation between job characteristics, organizational climate and work engagement in a service sector organization, applying both qualitative and quantitative approach. The sample covered 33 employees taking part in focus group discussions (FGD) and 98 employees that filled out questionnaires. Through FGD some key work characteristics were identified and they were further included in quantitative study and analyzed in relation with work engagement. The results imply that both organizational and job crafting interventions are needed in order to optimize individual and team engagement.

Keywords: job characteristics, organizational climate, individual engagement, team engagement, service sector

Introduction

Business functions and processes within large companies are nowadays under intense pressure to increase efficiency and effectiveness and to deliver better services for less money. One of the ways for companies to save costs is by offshoring ‘administrative’ and ‘transactional’ jobs into a shared service organization (SSO) in low cost markets.

Shared services organizations (SSO) plays a significant role in the development and progress of the national economies in Central and Eastern European countries (Marciniak, 2014). They provide a range of business services such as accounting, logistics, and procurement. Shared services organizations in Serbia, being representatives of international brands, are usually attractive as employers and they could easily hire highly motivated, young and highly qualified workforce. On the other hand, these organizations usually offer predefined jobs that might be seen as both an opportunity and a challenge for further career development. Understanding the interplay between job demands and resources are key for understanding employees’ engagement and motivation (JD-R model, Bakker, & Demerouti, 2018). This ‘interplay’ could be quite specific and unique for each company (organizational climate) and each industry.

The aim of this research was to analyze the relation between job characteristics, organizational climate and work

engagement within a SSO using mix-method approach. Relying on JD-R model, the aim of the *Study 1* was to map job characteristics and aspects of organizational climate typical for a shared service organization from Serbia through exploring which practices are perceived as demanding or empowering. We hypothesized that job characteristics identified through qualitative analysis would be further shown as significantly correlated with individual and team engagement. In the *Study 2* we explored the relationship between job characteristics that are perceived as demanding or empowering on one side, and individual and team engagement on the other side.

Method

In *Study 1* we have performed 4 focus group discussions (FGD) that covered 33 employees from different hierarchical positions and with different length of work experience from one particular SSO. The data were analyzed by using qualitative content analysis (Bauer, 2000; Flick, 2014). Participation in FGD was voluntary, non-remunerated and confidential, all participants were informed about the possibility to withdraw from discussions at any point.

In *Study 2* we have analyzed individual and team engagement taking into the account previously identified variables (themes) by examining the teams with the most diverse job characteristics (a selective sampling approach). Altogether 98 employees (46% women; 24% managers), participated in the *Study 2*, all from the same SSO. This number of employees represents about 1/3 of total employees from this organization. Participation in this research was anonymous, voluntary, and non-remunerated. Employees filled out paper-and-pencil questionnaires and they were informed about the way data were going to be used and the possibility to withdraw from research at any point.

Variables and instruments

Work engagement was measured by the three-item Serbian version of the Utrecht Work Engagement Scale (Petrović et

al., 2017; [Schaufeli and Bakker, 2003](#)), followed by the seven-point Likert scale (from 0 = never, to 6 = always). The Cronbach's alpha for this sample was 0.75.

Teamwork engagement was measured by three items adopted from the Team Work Engagement Scale (Torrente et al., 2012). The items were chosen to be parallel to ones used for measuring individual work engagement. Each item was followed by a seven-point Likert scale (from 0 = never, to 6 = always). The Cronbach's alpha was 0.84.

Supervisory support, organizational well-being and employees' involvement in decision making scales were adopted from Patterson et al., 2005 Organizational Climate Measure; subscales Supervisory Support (5 items), Welfare (4 items) and Involvement (6 items). All items were followed by four points Likert scale (from 1 = definitely false to 4 = definitely true). The Cronbach's alpha for supervisory support was 0.84, for well-being, it was 0.90, and for involvement in decision making it was 0.81.

Autonomy, skill variety and problem-solving scales were adopted from the Work Design Questionnaire (Morgeson & Humphrey, 2006). Autonomy was measured using 3 items (Cronbach's alpha = 0.84), skill variety by 4 items (Cronbach's alpha = 0.87), and problem solving by 4 items (Cronbach's alpha = 0.74). All items were followed by five-point Likert scale (from 1 = completely disagree to 5 = completely agree).

Perceived coworker support was measured using three items from Hayton, Carnabuci and Eisenberger (2012) modified version of Perceived Organizational Support, POS scale. The scale has six items followed by a five-point Likert scale (from 1 = completely disagree to 5 = completely agree). The Cronbach's alpha was 0.90.

Workload was measured by using Quantitative Workload Inventory (Spector & Jex, 1998). The scale has 5 items with five response choices, from 1 – never to 5 - several times per day. The Cronbach's alpha was 0.79.

Results

After coding FGD transcripts we have formed the wider categories by searching for recurring answers. Wider themes were established after analyzing similarities among categories, relying upon the JDR model framework. There were seven wider themes that were essential for understanding individual and team engagement in the SSO context. The themes and representative answers are given in Table 1. The wider themes were further used in Study 2 as variables related to individual and team engagement.

Table 1: Wider themes and sample answers.

Theme	Sample answer
Involvement in decision making	<i>We are doing this job every day and we are the ones facing these problems... but when decisions are made, no one is considering our inputs seriously</i>
Organizational wellbeing	<i>I think that our company could support us more</i>
Supervisory and peer support	<i>I know I can rely on my teammates as well as my boss to help me when things get tough</i>
Autonomy	<i>It's good to have procedures, but this predefined instructions on how I should do my job do not always work, because I do not have any freedom to act upon my opinion</i>
Skill variety	<i>Often it seems that I could contribute more I'm not utilizing my knowledge and experience enough</i>
Problem solving	<i>Sometimes it feels like I do not have enough opportunities to be creative</i>
Workload	<i>I just cannot complete everything on time...</i>

The correlations between individual and teamwork engagement on one side, and demanding aspects of work on the other side, are presented in Table 2. Only variables that have shown significant correlation with individual and team engagement were used in multiple linear regression analysis (Table 2).

Table 2: Correlations between individual and team engagement and different aspects of work in SSC.

	Individual engagement	Team engagement
Involvement in decision making	.419**	.496**
Organizational well-being	.467**	.535**
Supervisory support	.293**	.424**
Peers' support	.201*	.429**
Autonomy	.146	.177
Skill variety	.274**	.001
Problem solving	.034	-.178
Workload	.128	-.022

Note. * $p < .05$; ** $p < .01$.

The predictors explained 40% of individual work engagement variance. It was found that only skill variety ($\beta = .30, p < .01$) and organizational wellbeing ($\beta = .36, p < .01$) significantly predicted individual work engagement. Further analysis indicated the same group of predictors (Table 2) explained 43% of team work engagement variance ($R^2 = .43, F(9,88) = 7.42, p < .01$). It was found that involvement in organizational decision making ($\beta = .28, p < .05$), organizational wellbeing ($\beta = .31, p < .05$) and peer support ($\beta = .23, p < .05$) significantly predicted teamwork engagement. The correlation between individual and teamwork engagement was moderate and significant ($r = .59, p < .01$).

Discussion and conclusion

The results imply that both organizational and job design interventions are needed in order to optimize individual and team engagement. Individual engagement in a SSO could be increased by crafting jobs to be more challenging in terms of skill variety; but at the same time by enhancing employees' wellbeing through lowering hindering job demands.

While job characteristics were related to individual engagement, social resources and involvement in decision making were related to team engagement. Teams who have sense of belonging, organizational support and who are involved in organizational decision-making will tend to be more engaged.

These resources are critical when it comes to organizations that have 'matrix' structure. These organizations usually have limited career advancement opportunities due to flat structure in local branches. Apart from that these organizations have teams that are scattered around the world, with decision making focal points being far away in another country. Since this study was based on data obtained within a particular organization, some job characteristics that showed no significant correlations with work engagement have to be further analyzed by using a more representative sample from different SSOs.

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PSYCHOLOGY OF ART

Aesthetic Evaluation of Pirot Carpet Patterns Regarding Complexity, Symmetry and Contrast

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Abstract

This research is focused on aesthetic evaluation of traditional Pirot carpet patterns. The idea was to test if complexity and symmetry influence the aesthetic evaluation of patterns. The total of 30 subjects, students of visual arts participated. Sample of patterns consisted of 18 standard forms, selected according to their levels of complexity, symmetry and contrast. Each pattern has been evaluated using 12 seven-point scales of semantic differential. Results showed two clusters of responses. The first cluster included 10 patterns which were recognized as symmetric, complex, containing black fields. Second cluster included 8 patterns which were asymmetric and contained no black elements. Symmetric, complex and black and white contrasted patterns are highly evaluated on most scales. Results demonstrate the importance of complexity and symmetry in the process of aesthetic evaluation of traditional folk art works. Also, those results are in accordance with traditional design, where patterns from the first cluster are typically positioned in the central part of the carpets.

Keywords: aesthetic evaluation; Pirot carpet; complexity

Complexity, Symmetry and Contrast as Factors of Aesthetic Evaluation and Classification

The complexity of visual forms as a formal characteristic of object is among the most frequent topics of experimental researches of the visual processing. Many researches showed divergent results. The group of authors (Birkhoff, 1933; Cupchik & Gebotys, 1988; Nicki, Lee, & Moss, 1981) demonstrated that the increase of complexity is reflected by decrease of aesthetic value of visual objects. Differently, according to other authors (Eysenck, 1968; Nicki & Moss, 1975; Pejić, 2006) increased complexity is followed by increased aesthetic evaluation of objects, the most complex objects tend to be perceived as most beautiful. Other group of authors (Berlyne, 1970; Saklofske, 1975) find medium level of complexity as most important factor of high aesthetic evaluation. The complexity appeared as most important factor of aesthetic evaluation in general (McLaughlin, Dunckle, & Brown, 1999). Reasons for the differences between results could be found in different stimuli used by different researchers (art or non-art objects) and different aspects of aesthetic evaluation observed. Complexity as a formal characteristic could be defined as symmetry, number of elements, redundancy, ambiguity,

quantity of information or some other way (Martindale, Moore, & Borkum, 1990). Also, there were differences between the tasks of the observers included (Kreitler, Zigler, & Kreitler, 1974) as well as in the subjective impressions of complexity. As it has been shown, the complexity of art object is not purely objective category, partly it is based on the subjective estimation by the observer (Silvia, 2005). Regarding symmetry, there are also differences between the researchers. Some findings report marginal importance of this factor (Locher, Stappers, & Overbeeke, 1998), while other authors see symmetry as very powerful predictor of aesthetic evaluation of visual forms. Regular and symmetric forms are highly evaluated (Eisenman & Gillens, 1968; Jacobsen & Hofel, 2002; Tinio & Leder, 2009) compared with irregular forms and are usually perceived as more meaningful (Munsinger & Kessen, 1964). The influences of two factors - complexity and symmetry are often overlapped and related (Moyles, Tuddenhan, & Block, 1965). Some researches showed that the symmetry appeared as more powerful predictor of aesthetic evaluation than complexity (Jacobsen & Hofel, 2002; Tinio & Leder, 2009).

In addition, even not in focus of this research, the contrast as a factor participates with all others in the process of aesthetic reception. It has been shown that clear contrast between figure and background supported and simplified the process of perception (Checkosky & Whitlock, 1973) and in accordance with that, highly contrasted visual forms were often evaluated as more beautiful (Reber, Winkielman, & Schwartz, 1998).

In general, complexity and symmetry appear as most powerful criteria of classification of art objects (Avital & Cupchik, 1998; Cupchik, 1974; Dakulović & Marković, 2006). That is the reason why they are included in this research.

The Aim of the Research

This research is focused on aesthetic evaluation of traditional ethno patterns, known as Pirot carpet ornaments. Pirot carpets are specially designed folk art-works and are historically important representing original ethno production. The idea was to find out the relation between the complexity and symmetry as formal characteristics of patterns and the level of appreciation of patterns. In other words – to test if complexity and symmetry influence the aesthetic evaluation of patterns.

Method

Subjects

Subjects were 30 students of visual arts (76.0% female and 24.0% male), from Faculty of Fine Arts, University of Arts in Belgrade, of both genders, age spanned from 19-27, who were educated in the field of visual arts but were not familiar with traditional ethno production of Pirot carpets.

Stimuli

As stimuli, 18 standardized, colorless patterns were chosen. Sample of stimuli regarding the complexity included simple forms (patterns in the forms of simple contour with less than 20 rectangular lines) and complex forms (patterns with more than 20 rectangular lines). Regarding the symmetry, sample included symmetric and asymmetric patterns, and regarding the contrast of the patterns there were patterns with and without black parts (black and white fields in the pattern). (Figure 1).

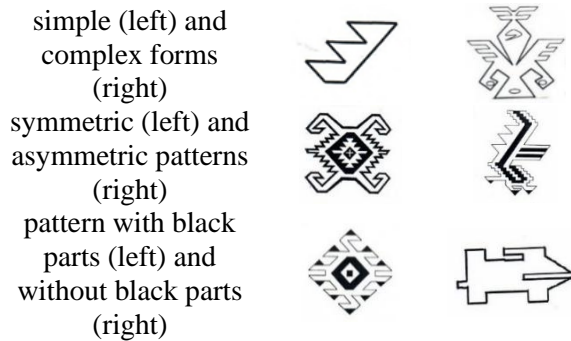


Figure 1: Stimuli regarding complexity, symmetry and contrast

Procedure

Patterns were presented one by one and subject evaluated each of them using 12-scale instrument of semantic differential created for the particular purpose. The instrument included selection of scales previously used in measuring aesthetic reception of visual objects (Pejić, 2007). The scales were: simple-complex, unusual-usual, boring-interesting, unnoticeable-salient, familiar-unfamiliar, ugly-beautiful, disharmonic-harmonic, indefinite-definite, unpleasant-pleasant, asymmetric-symmetric, static-dynamic, serious-funny. There were no time limits for evaluation.

Results

K-means method identified two clusters. First cluster includes 10 patterns, which are recognized as symmetric, complex, with black fields. They were highly estimated as symmetric, complex, interesting, salient, unusual, harmonic as well as moderately pleasant, dynamic, familiar and definite. Second cluster includes 8 patterns, which are asymmetric and contain no black elements. They were

estimated as unusual, dynamic, funny, familiar, definite, pleasant, uninteresting, unnoticeable, disharmonic, ugly, simple and asymmetric. (Figure 2; Table 1).

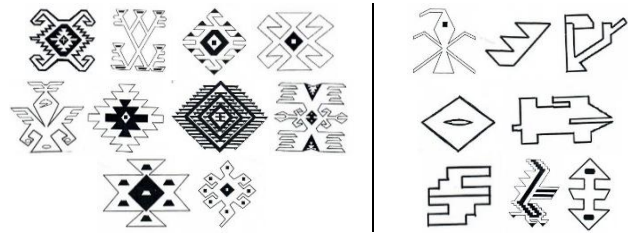


Figure 2: Cluster 1 (left) and cluster 2 (right)

Table 1: Descriptive Statistics for Clusters

Scales	Cluster1		Cluster2	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
simple-complex	5.67	.68	3.73	1.74
unusual-usual	5.16	.88	4.20	1.27
boring-interesting	5.30	.74	3.92	.70
unnoticeable-salient	5.29	.72	3.91	1.18
familiar-unfamiliar	4.48	.70	4.09	.50
ugly-beautiful	5.05	.47	3.87	.33
disharmonic-harmonic	5.15	.47	3.89	.91
indefinite-definite	4.29	.54	4.05	.42
unpleasant-pleasant	4.91	.52	4.02	.44
asymmetric-symmetric	5.79	.85	3.71	1.60
static-dynamic	4.51	.76	4.19	1.04
serious-funny	3.53	.52	4.12	.62

Analysis of variance showed differences between clusters for the following scales: complex $F(1, 16)=10.60, p<.01$; interesting $F(1, 16)=16.05, p<.01$; salient $F(1, 16)=9.33, p<.01$; beautiful $F(1, 16)=35.49, p<.01$; harmonic $F(1, 16)=14.44, p<.01$; pleasant $F(1, 16)=14.92, p<.01$; symmetric $F(1, 16)=12.55, p<.01$ and funny $F(1, 16)=4.79, p<.05$.

Scales: usual $F(1, 16)=3.65, p>.05$; familiar $F(1, 16)=1.71, p>.05$; definite $F(1, 16)=1.09, p>.05$ and dynamic $F(1, 16)=.58, p>.05$ showed no statistical differences between the clusters.

Discussion

Two factors, the complexity and symmetry appeared as related with aesthetic evaluation. In addition, complex and symmetric patterns together with contrast (black fields), were also highly evaluated as interesting, salient, unusual, harmonic as well as moderately pleasant, dynamic, familiar and definite.

As we can see, the patterns which were asymmetric and contained no black elements were not so highly evaluated. Those results are in accordance with the findings that

stressed the importance of complexity (McLaughlin, Dunckle, & Brown, 1999) and symmetry (Eisenman & Gillens, 1968; Jacobsen & Hofel, 2002; Tinio & Leder, 2009) as factors of aesthetic decision making process (Avital & Cupchik, 1998; Cupchik, 1974; Dakulović & Marković, 2006). They are also in accordance with the researches that demonstrate the importance of contrast (Reber, Weinkielman, & Schwarz, 1998).

As predicted by researches of visual art reception, subjects formed their aesthetic impressions based on complexity, interestingness, salience, beauty, harmony, pleasantness, symmetry and fun. Symmetric, complex and black and white contrasted patterns are highly evaluated. This finding is also in accordance with traditional design and folk art where these forms are usually positioned in the central part of the carpet.

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Relation between the Aesthetic Evaluation and Position of Pirot Carpet Patterns

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Abstract

The research investigates the relation between aesthetic reception and position of ethno patterns. Traditionally, Pirot carpets are designed according to standardized procedure and position of the pattern is important aspect of design. The subjects, 30 students of visual arts, trained in visual arts but not familiar with this form of ethno production, estimated preferable position and aesthetic value of the patterns. As stimuli, 18 standardized, black-white patterns were used. Subjects estimated each pattern using 12-scale instrument of semantic differential created for the particular purpose. Also, the question regarding preferable position (central, middle, periphery) was included. Results show that preferable space position of the patterns is linked with aesthetic evaluation. Results are in accordance with the assumption that highly evaluated objects tend to be placed in the central position of the works of art. Also, it is congruent with traditional design of Pirot carpets where most beautiful patterns are placed in the central position.

Keywords: ethno patterns; aesthetic evaluation

Introduction

This research is focused on relation between the aesthetic reception and position of ethno patterns. Traditionally, Pirot carpets are designed according to standardized procedure and position of the pattern is important aspect of the design. Surface of the carpet is typically divided in one, two or three fields where central part is seen as most important. Most beautiful patterns are placed in this position. It is believed that the patterns of the carpet, which are standardized, stylized, geometric forms, symbolize the real objects and that way represent the sort of good message or blessing to the family of the owner.

The goal of this research is to test the relation between the aesthetic value of Pirot patterns and predicted position on the carpet. Connection between the importance, meaningfulness, aesthetic value of form and its position on the surface or in the space is not new in psychology. William James defined human consciousness as a cognitive field divided in two functional parts: focus, which is most important and background, where less important objects are perceived (James, 1890/1981). The idea that most important figures should be positioned in the central part of the painting has been known by artist long ago (Ross, 1907) and was later demonstrated by findings of gestalt school (Arnheim, 1974; 1982). Arnheim described the visual field as a dynamic structure within which the perceptual forces are interrelated and manifested. The central part of

perceptual field is experienced as dominant and attractive by the observer. This finding has been approved by many other studies (Locher, Stappers & Overbeeke, 1998; Palmer, 1991; Palmer, Gardner & Wickens, 2008; Palmer & Guidi, 2011).

The Aim of the Research

This research tests the relation between preferred position of pattern and its aesthetic value. It is expected that high aesthetic value of pattern will be related with tendency to place it in the central position on the imagined carpet. It would be congruent with above mentioned Arnheims idea that visual field contains different levels of importance and central part is seen as most important among them. According to him, formal characteristics of visual objects such as brightness, hue, size, density of details play crucial role in the process of visual perception. For the purpose of this research, patterns were selected according to the levels of complexity, symmetry and contrast as characteristics of the objects. The correspondence between aesthetic value of pattern and its preferred position was of interest.

Method

Subjects

As subjects 30 students of visual arts were included (76.0% female and 24.0% male), from Faculty of Fine Arts, University of Arts in Belgrade, of both genders, average age 20, who were educated in the field of visual arts but were not familiar with traditional ethno production of Pirot carpets.

Stimuli

As stimuli, 18 standardized, colorless patterns were chosen from the list of Pirot traditional patterns. Sample of stimuli regarding complexity included simple forms (patterns in the forms of simple contour with less than 20 rectangular lines) and complex forms (patterns with more than 20 rectangular lines). Regarding symmetry, sample included symmetric and asymmetric patterns, and regarding the contrast of the patterns there were patterns with and without black parts (black and white fields in the pattern). (Figure 1).

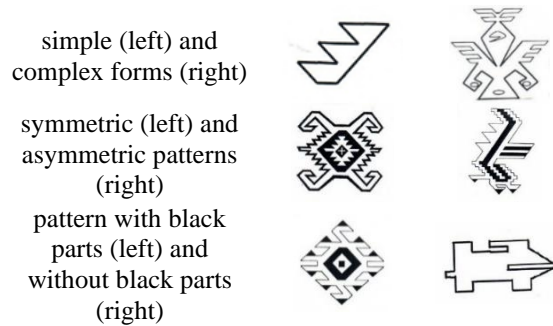


Figure 1: Examples of stimuli regarding complexity, symmetry and contrast

Procedure

Patterns were presented to each subject in balanced order. Subject evaluated each of them using 12-scale instrument of semantic differential created for the particular purpose. The instrument included scales previously developed, tested and implemented for measuring aesthetic reception of visual objects (Pejić, 2007). Scales selected and included in this research were: simple-complex, unusual-usual, boring-interesting, unnoticeable-salient, familiar-unfamiliar, ugly-beautiful, disharmonic-harmonic, indefinite-definite, unpleasant-pleasant, asymmetric-symmetric, static-dynamic and serious-funny. Also, the question regarding preferable position (central, middle, periphery) was included. There were no time limits.

Results

Analysis of variance showed that space orientation is linked with nine out of twelve scales. Statistically significant differences appeared for the following scales: complex $F(2, 28)=19.65$, $p<.01$; unusual $F(2, 28)=19.08$, $p<.01$; interesting $F(2, 28)=33.57$, $p<.01$; salient $F(2, 28)=33.26$, $p<.01$; beautiful $F(2, 28)=30.05$, $p<.01$; harmonic $F(2, 28)=10.08$, $p<.01$; pleasant $F(2, 28)=17.95$, $p<.01$; symmetric $F(2, 28)=16.72$, $p<.01$ and dynamic $F(2, 28)=5.09$, $p<.01$. High values on these scales are significantly related with tendency to place the patterns in the central place of the imagined surface. Scales: familiar $F(2, 28)=.24$, $p>.05$; definite $F(2, 28)=1.61$, $p>.05$ and funny $F(2, 28)=.66$, $p>.05$ showed no statistically significant differences regarding preferable space position. Scales and statistically significant results are presented in table 1.

Table 1: Scales that showed statistically significant differences regarding the preferred position

Scales	Pairs		<i>MD</i>	t-test	<i>df</i>	<i>p</i>
simple-complex	central	middle	.75	3.85	28	.00
		periphery	1.34	6.24	28	.00
	middle	periphery	.59	2.75	28	.01
unusual-usual	central	middle	.67	3.85	28	.00
		periphery	1.20	6.07	28	.00
	middle	periphery	.530	2.71	28	.01
boring-interesting	central	middle	.81	4.42	28	.00
		periphery	1.65	8.12	28	.00
	middle	periphery	.84	4.18	28	.00
unnoticeable-salient	central	middle	1.19	6.87	28	.00
		periphery	1.45	7.54	28	.00
	middle	periphery	.26	1.40	28	.16
ugly-beautiful	central	middle	.84	4.58	28	.00
		periphery	1.52	7.85	28	.00
	middle	periphery	.68	3.50	28	.01
disharmonic-harmonic	central	middle	.45	2.33	28	.02
		periphery	.89	4.53	28	.00
	middle	periphery	.45	2.34	28	.02
unpleasant-pleasant	central	middle	.63	3.59	28	.00
		periphery	1.08	6.00	28	.00
	middle	periphery	.46	2.62	28	.01
asymmetric-symmetric	central	middle	.90	4.37	28	.00
		periphery	1.27	5.69	28	.00
	middle	periphery	.37	1.61	28	.11
static-dynamic	central	middle	.20	.97	28	.33
		periphery	.67	3.06	28	.01
	middle	periphery	.47	2.25	28	.02

Discussion

Results show that preferable space position of patterns is linked with aesthetic evaluation, more beautiful and aesthetically highly valued patterns showed statistically significant tendency to be positioned in the center. Patterns that are estimated as simple, usual, uninteresting, unnoticeable, ugly, disharmonic, unpleasant, asymmetric and static are more frequently related with middle and peripheral positions. Results are in accordance with the assumption that highly evaluated objects tend to be placed in the central position of the works of art (Arnheim, 1974; 1982; Palmer, Gardner & Wickens, 2008 1998; Palmer, 1991; Palmer, Gardner & Wickens, 2008; Palmer & Guidi, 2011). Also, it is congruent with traditional design of Pirot carpets where most beautiful patterns are placed in the central position.

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Visual Art and VR: Experience of Art Exhibition in VR and Real-world Setting

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Abstract

In the present study, we compared the aesthetic and affective experience of an art exhibition presented in a VR gallery and in a real-world setting. Twenty-eight participants (the visitors who attended exhibition opening) visited the exhibition, which consisted of the same twelve paintings presented in a VR gallery and a real gallery. Visitors were randomly assigned to one of two groups upon arrival to the gallery. Half of the participants visited the exhibition in the VR first and subsequently in the real-world setting, while the other half visited the exhibitions in the opposite order of settings. After experiencing the exhibitions in both settings, participants rated their aesthetic experience of exhibitions on a liking scale, and affective experience on three other scales (pleasantness, impressiveness and interestingness). Results showed no statistically significant difference in aesthetic experience of the exhibition in the VR gallery compared to the real-world setting. Further, exhibitions in both contexts were experienced as similarly pleasant. However, the exhibition in the VR gallery was experienced as being more impressive and more interesting than the exhibition in the real-world setting. Findings of this study suggest that presenting art in VR can be an adequate alternative to real-world contexts leading to similar aesthetic experiences.

Keywords: virtual reality; VR gallery; art experience; arousal

Introduction

Viewing artworks in different contexts can lead to differences in aesthetic experience. For instance, studies have shown that the medium through which artworks are presented has an impact on aesthetic experience. Previous research examining contextual difference between real-world galleries and artworks displayed on computer screen showed that artworks are perceived as more immediate and pleasant when viewed in a museum (Locher, Smith, & Smith, 1999), as less interesting, less arousing, less positive, less memorable and are liked less when viewed on computer screen (Brieber, Nadal, & Leder, 2015) and that people spent more time looking at artworks in museum when compared with ones shown on computer screen (Brieber,

Nadal, Leder, & Rosenberg, 2014). These differences may exist partly due to the fact that a lot of the properties of an artwork are lost when said work is presented on a screen (e.g. size, 3D elements).

However, while studying art experience in real-world contexts (i.e. art galleries and museums) guarantees ecological validity, it can be unsatisfactory in terms of experimental control. In a real-world setting (Path #1 according to Carbon's (2019) terminology of measurement strategies of art experience), we lack the power of randomization to prevent order effects and there exist certain interactions between the artwork and the physical and social context that we cannot control. Implementing VR into the study of aesthetic experience may offer a solution to the aforementioned problems common in aesthetic experience studies relying on real-world art venues. With VR, it's possible to implement important properties of ecological context (e.g. large scale of artworks and exhibition-like context) in controlled laboratory setting (Carbon, 2020).

Previous research also suggested that presenting artworks via VR could have some advantages over displaying them via computer screen. This finding is particularly relevant when deciding which medium to use in aesthetic experience studies. For example, Janković, Jevremović and Carbon (2019) found that the aesthetic experience of paintings was more intense, the artworks were experienced as being more impressive, and participants were more motivated to know more about the paintings in the VR setting compared to computer screen setting.

The aim of the present study was to compare the aesthetic and affective experience of an art exhibition presented in a VR gallery and in a real-world setting.

Method

Participants

Twenty-eight participants (64.3% females) took part in the study. Participants ($M_{\text{age}} = 37$, $SD = 11.28$) were spontaneous visitors of the opening of the art exhibition. All participants had normal or corrected to normal vision and their participation in the study was voluntary.

Stimuli

Two sets of stimuli were used in this study. The first set of stimuli consisted of twelve original contemporary art paintings, mostly pop-art, exhibited in real gallery space (artists: Andy Warhol, Dado Đurić and Vladimir Veličković), while the second set of stimuli consisted of digital images in high resolution of the same paintings presented in VR gallery. Images in the VR gallery space were the same size as the original ones and they were presented at eye level.

Instrument

A 20-item questionnaire, consisting of unipolar 10-point scales and open questions was used in the study. Scales were used to measure participants' aesthetic experience (operationalized as liking) and affective experience (operationalized through pleasantness, impressiveness and interestingness) of real world and virtual reality exhibitions, separately.

Procedure

Stimuli were presented in two parallel settings: VR gallery and real gallery space. The VR gallery was built using VR-All-Art application and presented using the Oculus Quest headset. Visitors were randomly assigned to one of the two settings upon arrival to the gallery. Half of the participants visited the exhibition in the VR gallery first and subsequently in the real-world setting, the other half visited exhibitions in the opposite order of contexts. After viewing the exhibition in both contexts, researchers conducted a semi-structured interview with each participant individually. Questions in the interview were focused on the experience of exhibition in VR gallery and in real-world gallery setting.



Figure 1: Real-world setting.



Figure 2: Space used for the VR part of the experiment.

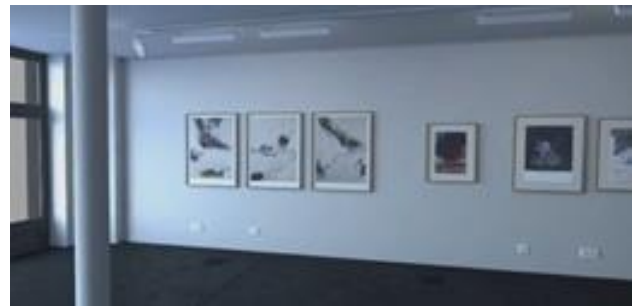


Figure 3: VR gallery setting from participant's perspective.

Results

Nonparametric tests were used due to the non-normal distribution of the data. In order to compare the two settings, data were analyzed by the Wilcoxon signed-rank test. Ratings of aesthetic experience of the exhibition in the VR gallery and real-world gallery showed no statistically significant difference ($Z(28) = -1.487$, $p = .137$, $r = -.28$).

Although exhibitions in both settings were perceived as equally pleasant ($Z(28) = -.849$, $p < .396$, $r = -.16$), the exhibition presented in the VR gallery was experienced as more impressive ($Z(28) = -1.978$, $p < .05$, $r = -.37$) and more interesting ($Z(28) = -2.752$, $p < .01$, $r = -.52$) (Figure 4).

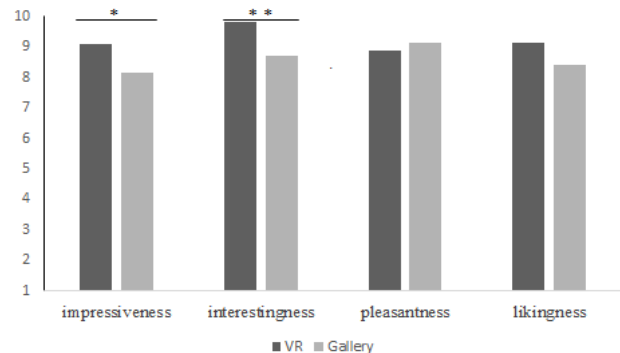


Figure 4: Differences in affective and aesthetic experience of art exhibition presented in VR gallery and real-world gallery.

Similar conclusions could be derived from qualitative analysis of responses collected in open questions focusing on participants' experiences of exhibitions presented in two

different contexts. Namely, analysis of most frequent adjectives used to describe aesthetic experience in VR gallery suggested that VR gallery setting is perceived as more interesting and more impressive than real-world gallery setting (the most frequent adjective was “interesting”).

Discussion and Conclusions

The goal of this study was to compare aesthetic and affective experience of art exhibition presented in a VR gallery and real-world gallery setting. We tested the experience of actual gallery visitors at the exhibition opening. Findings of this study showed that there were no differences in aesthetic experience of art exhibition presented in VR gallery and in real-world gallery settings.

However, the results showed that experience of art exhibition in VR gallery and real-world gallery differ in terms of arousal experienced by visitors (impressiveness and interestingness). Namely, exhibition presented in a VR gallery is perceived as more arousing than the same exhibition presented in real-world gallery setting. This finding is in line with previous study that suggested that artworks in VR setting are experienced as more impressive than in the laboratory (computer screen) setting (Janković, Jevremović & Carbon, 2019). Having in mind that all participants in this study had no or very little prior experience with VR, it is possible that the difference in the perceived impressiveness and interestingness between virtual and real-world gallery can be explained by the novelty of VR galleries. The question is whether this effect will remain even when VR technology becomes widely available and respondents have more previous experience with VR galleries.

Findings of this study suggested that regular gallery visitors equally liked exhibition presented in VR gallery as exhibition presented in real-world gallery. Additionally, results suggested that exhibition presented in VR gallery is perceived as pleasant as exhibition presented in real-world gallery. Having in mind that VR gallery and real-world gallery settings were not completely identical (some details like the color of the floor were different), in the following studies we will use completely parallel settings in order to examine in more detail the ecological validity of VR galleries as a context for art experience.

Acknowledgments

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PERCEPTION

The Effect of Perceptual Load on the Effectiveness of Divided Attention

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Abstract

The aim of this research is to examine the efficiency of divided attention depending on the type of the task. The research dominantly deals with the issue - whether the enhancement of perceptual load in one task affects the efficiency of performing two simultaneous tasks. A modified task of Mack and Rock (1998) was used in this experiment to examine implicitly divided attention. Participants had two tasks - the primary assessment task and the secondary task of perceiving a new stimulus. One factor (perceptual load) was varied with two levels (high and low). The task of higher perceptual load was line length estimation, while the task of lower perceptual load was line color estimation. The research was conducted on a sample of 62 participants, students of the University of Banja Luka. The results of the binary logistic regression showed that there was an effect of the level of perceptual load on the detection and the localization of the new visual stimulus, but not on the identification. These findings can be explained by models that explain information processing by the structure of the cognitive system, but also by models that emphasize limited attention capacities.

Keywords: perceptual load, divided attention, double tasks

Introduction

Visual attention is ability to direct the processing of information within the visual field (Palmer, 1999). However, human action in the environment often involves the simultaneous reception and processing of a large number of information belonging to the same or different sensory modalities. In that case, attention must be divided to more stimuli. The process of directing attention to certain contents takes place within a working memory in which information is temporarily retained and processed. The basic assumption of Baddeley's model of working memory is that if we simultaneously perform two tasks that use the same component of working memory, i.e. they are of the same modality, the success of such performance will be poor. In the case of performing two tasks of different modality, the situation is different because they use different components of working memory, and the success in performing them is the same regardless of whether they are performed individually or together (Baddeley & Hitch, 1974). In addition to Baddeley's widely accepted multicomponent working memory model, alternative theoretical models are known, such as the episodic memory model related to objects (Jones, Beaman, & Macken, 1996), which assumes that temporary storage of information takes place within a single memory domain, as well as a feature model (Nairne, 1990; Neath, 2000) that assumes that each characteristic in memory is encoded into two separate

memory systems (primary and secondary memory) where only information in the primary is immediately available. The third model is the model of embedded processes (Cowan, 1999) and it starts from the assumption that working memory does not exist as a separate entity, and individual differences in working memory tasks can be explained by limitations in attention and long-term memory.

In addition to working memory models that explain the division of cognitive resources during the performance of dual tasks, there are also theories that explain the same problem with limited attention capacity. One of these theories is Neil Lavie's theory of perceptual load (Lavie, 1995; 2006), according to which attention has limited capacity, and processing takes place in such a way that relevant information takes up capacity first, and the remaining capacity is used to process irrelevant information. Perceptual load refers to the amount of information involved in the perceptual processing of a stimulus and it depends on the number of stimuli in the task or the perceptual requirements of the task (Lavie & Tsai, 1994; Lavie, 1995). It follows that the task of high perceptual load should occupy more attention capacity than the task of low perceptual load (Bonnell, Possamai, & Schmitt, 1987; Lavie, 1995). Many bibehavioral studies have shown that perceptual load affects the level of distractor interference (Lavie & Tsai, 1994; Forster & Lavie, 2007; 2008; Wei, Kang, & Zhou, 2013) and lead to a prolonged reaction times and more errors (Lavie, Beck, & Konstantinou, 2014).

The aim of this research is to examine the efficacy of divided attention, depending on the type of task. The question is whether the increase in perceptual load in a one task affects the efficiency of performing two simultaneous tasks.

Method

Sample

Sixty-two undergraduate students participated in this experiment. The mean age was 22.45. Subjects were randomly divided into two equal experimental groups.

All subjects had normal or corrected to normal vision.

Design and Procedure

A modified task of Mack and Rock (1998) was used to examine implicitly divided attention. Subjects performed visual discrimination task. A cross was centrally presented in each trial for 250 ms. There were two experimental conditions. In one condition one of the cross's arm was green, the other was blue and subjects had to answered which arm

was blue. This was low perceptual load condition. In other (high perceptual load) condition one of the cross's arm was longer than other and subjects had to answer which arm was longer. Each subject performed either low or high load condition. Subjects responded verbally and experimenter recorded responses in prepared form. This "primary" task was same in four trials. In fourth trial a new, critical stimulus was presented in one of the cross's quadrants. Before this trial subjects were instructed to "divide" attention and try to perform two tasks – visual discrimination task and perceiving a new stimulus (detection of its presence, localize its position and identify it in the series of offered stimuli in prepared form). A new stimulus was geometric shape (circle) and was presented in one of the cross's quadrants. Circle was blue and positioned on an imaginary line intersecting the quadrant at an angle of 45°. Experimental session lasted approximately 5 minutes per participant. The experiment was prepared in the software package SuperLab 4.5 for Windows.

Results

In the first part of the analysis, we analyzed the accuracy in the tasks.

Table 1. Percentages of correct answers in the primary task

Task	First trial	Second trial	Third trial	Fourth trial
Color estimation	66	72	66	66
Length estimation	34	28	34	34

The results in Table 1 show that the subjects were more successful in the color estimation task compared to the length estimation task. By individual comparison of the results in two experimental conditions, it was determined that the obtained differences were statistically significant (for first trial $\chi^2(1, 62) = 15.343, p < .01$; for second trial $\chi^2(1, 62) = 27.395, p < .01$; for third and fourth trials $\chi^2(1, 62) = 19.787, p < .01$). Since this is evident in all trials, that implies that color assessment is a less demanding task.

Table 2. Percentages of correct answers in the secondary task

	Task	
	Color estimation	Length estimation
Detection*	68	52
Localization*	65	42
Identification*	35	19

*of critical stimulus

Results in Table 2 show that the accuracy in the secondary task (detection, localization and identification of the new stimulus) is different depending on the type of the primary task. Subjects who estimated the color of the lines have a larger number of correct answers than subject who had the

task of length assessment. These differences are statistically significant ($\chi^2(1, 62) = 5.333, p < .05$ for detection; $\chi^2(1, 62) = 10.632, p < .01$ for localization; $\chi^2(1, 62) = 6.494, p < .05$ for identification). Results in Table 2 also show that the most correct answers are in the detection task and the least in the identification task ($\chi^2(1, 62) = 15.826, p < .001$).

Binary logistic regression was applied to predict the relationship between perceptual load and achievements in the secondary task, since these dependent variables (detection, localization and identification of new stimulus) were categorical. We also included performance in the primary task in the analysis to determine whether changes in the values of the dependent variables were only influenced by perceptual load.

Table 3. Results of binary logistic regression

	B	S. E.	Wald	df	Sig.	Exp (B)
<i>Success in the primary</i>	-1.20*	.75	2.56	1	.11	.30
	-.92**	.75	1.52	1	.22	.40
	.77***	.95	.66	1	.42	.21
<i>Perceptual load level</i>	-1.25*	.64	3.79	1	.049	.29
	-1.39**	.66	4.45	1	.03	.25
	-.50***	.69	.53	1	.47	.61

*Detection of critical stimulus

**Localization of critical stimulus

***Identification of critical stimulus

The results of binary logistic regression show that there is no effect of success in the primary task on the detection of a new stimulus, its localization and identification. On the other hand, the level of perceptual load in the primary task significantly predicts success in the second task. But this effect was significant only for the detection and localization, but not for the identification of a new stimulus.

Discussion and conclusion

This study examined the divided attention in order to determine the mechanism of performing two tasks at the same time. The level of perceptual load in the primary task was varied, and the effect of that manipulation on the efficiency of divided attention was analyzed. If performing one task leads to a decrease in accuracy in another task, it would mean that attention cannot be divided into two simultaneous tasks. In our study, success in the primary task did not affect efficiency in the second, but the perceptual load did. Varying the perceptual load in the primary task was related to the variation in the type of task. In our experiment, there were two types of primary task: the line length estimation task and the line color estimation task. The results show that the task of length estimating was more difficult for the participants compared to the task of color estimating, because there were more incorrect answers in this task. In the secondary task for both groups of subjects, the most correct answers were for the detection of a new stimulus, then for localization, and the most errors occurred for the identification of the critical stimulus. Such results are not unexpected, because these tasks

are related to different aspects of perception. Detection is a basic level of perception that refers only to the noticing of the stimulus presence without including information about its characteristics. Localization is a more specific level of perception because it refers to determining the position of the stimulus within the global coordinate system that defines the arrangement of all its components (Ivry & Robertson, 1998, according to Rhodes & Robertson, 2002). Identification is the "highest" and most accurate level, because it determines the different features of stimulation that create a holistic percept. Attention engagement differs in these aspects of perception. Identification requires the highest level of focused attention. Performing two tasks is reflected in impairment of the identification accuracy because it leaves little available resources of attention. Further, results show that performance in second task was reduced when the perceptual load become higher, which is consistent with Lavie's perceptual load theory. But this assumption has been confirmed only for detection and localization of new stimulus and not for the identification. Perception is a dynamic process and occurs automatically while the available capacities are used up. When task imposes a higher perceptual load, the existing capacities are used up faster, so that distractors and new sensory information cannot be processed. Greater attention is required for identification of stimulus, so in this case the limited presentation time led to the largest reduction in correct answers. On the other hand, these findings can be explained by models that explain the processing of information by the structure of the cognitive system. According to the model of embedded processes (Cowan, 1999) when the stimulus are irrelevant, like critical stimulus in this experiments, it does not disappear from memory, but is available in memory so that a person can use it later if the need arises and if invest enough effort to direct attention. Although Baddeley's model predicts success in simultaneous tasks if they belong to the same sensory modality, the poorer performance in stimulus identification can be explained by the division of visual working memory into spatial and object memory systems (Ruchkin et al., 1996).

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Conflict and Facilitation in Visual Cognition: A Dual-process Approach

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Abstract

Conflict monitoring, detection and resolution have been key foci of research within the dual-process framework of reasoning. The current study attempts to bridge the gap between classic reasoning and visual reasoning by applying a similar testing paradigm to determine whether the two rely on similar principles and processes. Participants were asked to accept or reject a cue number depending on whether it represents the actual number of stimuli (black circles) shown on the screen. The key manipulation leaves stimuli equidistant or groups them in multiple groups based on proximity. In the latter case, Gestalt processes lead to different judgments when compared to stimuli segmentation and this was exploited to observe the effects of congruence on accuracy and response times. The results show participants were less accurate and slower in conflict conditions which implies similar principles as in classic cognitive reasoning tasks. The findings demonstrate how visual cognition processes that run in parallel can interfere with one another. In such cases conflict resolution process are activated in order to settle on a response.

Keywords: Gestalt grouping, visual cognition, scene segmentation, dual-process theory, Visual Grouping Conflict task

Introduction

The classic view of dual-process reasoning and thinking postulates the existence of Type 1 and Type 2 systems or processes. Type 1 processes are automatic, unconscious, fast and heuristic-based while Type 2 processes are slow, conscious and based on more complex processing (for a more comprehensive review see Evans, 2008). This classic view has been challenged by developments in the past two decades, with many hypothesized differences between the two types of processing debunked in this period (Evans, 2012).

Modern models propose that there are multiple Type 1 processes based on different principles. This means that, apart from classic heuristics such as the representativeness heuristic, there are also logical and mathematical intuitions which were previously mostly categorized as Type 2 thinking (Pennycook et al., 2015; Stanovich, 2018) but are now considered Type 1. Any decision or task may activate multiple Type 1 processes which may result in them pointing towards the same response, or towards conflicting responses. If the conflict is detected, Type 2 processes resolve it, either through rationalization (accepting the dominant Type 1 response) or decoupling (abandoning the dominant in favor of an alternative response). If Type 1 processes are not sufficient to provide an adequate response or the task is too complex for intuitive response to arise, then more complex Type 2

processing (what was meant by Type 2 in the classic approach) may be activated from the very start (Dujmović & Valerjev, 2018; Dujmović, Valerjev, & Bajšanski, 2020).

Many tasks have been developed in order to investigate conflict detection and resolution in reasoning and these have become some of the key areas of interest in order to understand how Type 2 processes arise and explain the stages of processing.

Concepts of conflict and inhibition are also widely used in vision, perception, attention, and cognition in general (MacLeod, 2007). When reviewing literature on perceptual and reasoning phenomena it is easy to draw parallels even though the literatures are separated. The separation is probably due to, up until recently, reasoning and rationality research being focused on the behavioral and cognitive level of investigation, with vision and perception primarily aiming at explanations on the neural level.

Among automatic processes in visual perception, Gestalt principles provide perhaps the best tools in the attempt to bridge reasoning and perception in terms of dual-processing. Gestalt grouping processes are one of the oldest, systematically researched phenomena in psychology starting with Wertheimer and his work on the phi motion (Wertheimer, 1912). Modern research into Gestalt phenomena indicates grouping happens on different levels of visual processing finally influencing conscious perception (Wagemans et al., 2012). For examples of Gestalt principles see Figure 1.

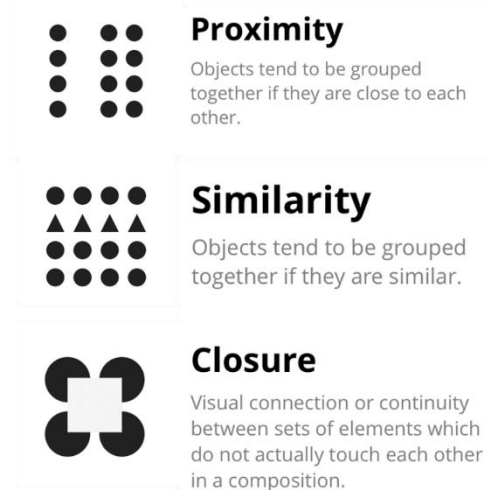


Figure 1: Examples of Gestalt grouping principles.

Since Gestalt phenomena emerge from automatic processes, they were used to develop a task which could combined with other visual processes in order to provide a similar testing paradigm as found in classic reasoning research. The paradigm rests on comparing performance (accuracy) and response times when different automatic processes are congruent and when they are in conflict (lead to different responses). Thus, the aim of this study was to develop a task which follows the outlined logic in order to determine whether automatic Gestalt processes interfere with visual cognition in a similar manner described within the dual-process framework for reasoning. For the current study the processes were simple scene (object) segmentation and the Gestalt principle of proximity. Hypotheses which follow from dual-process literature are that conflict reduces performance and prolongs response times.

Methods

Undergraduate psychology students ($N = 55$) completed a novel task designed for the purposes of this study. We provisionally named it the Visual Grouping Conflict task (VGC task). The individual stimuli (black circles) are automatically segmented in the scene and enumerated. Their possible grouping according to proximity activates Gestalt processes and the grouping is also processed automatically. The results of these processes (number of stimuli vs number of groups) can be congruent or in conflict and this can be systematically manipulated (for experimental condition see Figure 2).

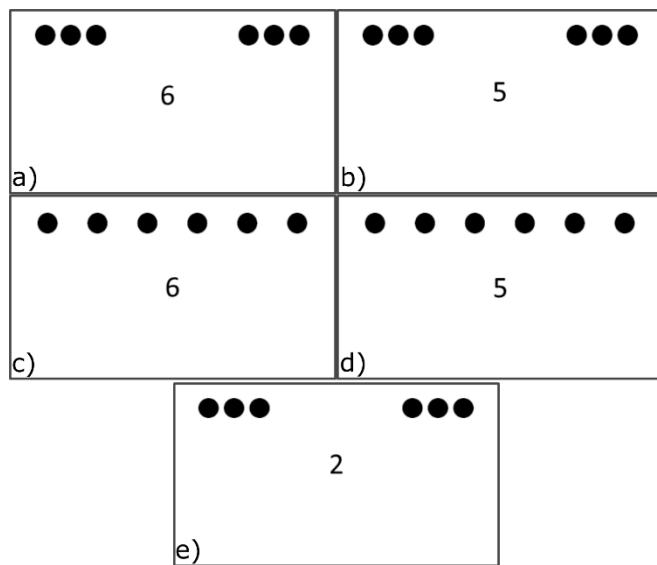


Figure 2: Examples of five experimental conditions in VGC task.

The task consisted of simply accepting or rejecting the number cue which appeared underneath the stimuli depending on whether the cue matches the actual number of stimuli on

the screen (black circles). The grouped condition is shown in panels a) and b), while the ungrouped condition is shown in c) and d) of Figure 2. Valid cue conditions are shown in a) and c) with invalid cues being shown in b) and d). This natural 2x2 design tests for whether grouping has an impact on accepting correct cues (making it more difficult in the grouped condition) and rejecting invalid cues (making it easier in the grouped conditions). One additional condition was added and can be seen in panel e). In this condition the cue was equal to the number of groups and results will be tested using a one-way ANOVA alongside the remaining two grouped conditions to determine whether rejecting the cue is made more difficult when it is congruent with the number of groups but in conflict with the actual number of stimuli.

On each trial participants were presented a fixation cross lasting 1500 ms followed by the stimuli (black circles) and the cue number beneath them. The participant had to accept or reject the cue number depending on whether the cue matched the actual number of black circles. This was done by pressing the keyboard keys ‘K’ (to accept) or ‘S’ (reject) as fast as possible. Prior to the main study participants had two training blocks. One to familiarize themselves with the keyboard response mapping and another which consisted of six training trials which mirrored the task but used numbers of stimuli and cues which did not appear in the main task. The total of 150 trials were randomized for each participant while making sure there was an equal number of trials on which they should accept and reject the cue. The number of stimuli was either four or six, grouped into groups of two or three while invalid cues could have one extra or one less circle than the actual number. Accuracy and response time was recorded for each trial.

Results

Total accuracy and mean response times were calculated for each participant in each experimental condition. Incorrect responses were excluded prior to calculating the mean response times.

Two 2x2 fully within-subject ANOVAs were conducted in order to determine the impact of grouping and cue validity on accuracy and response times (results in Table 1).

Table 1: ANOVA results of the effect of grouping and cue validity on accuracy and response times (RT).

	Accuracy		RT	
	$F(1, 54)$	η_p^2	$F(1, 54)$	η_p^2
Grouping	0.04	.00	24.86**	.31
Cue validity	3.52	.06	81.73**	.60
Interaction	18.93**	.26	35.34**	.40

**p < .001

The results showed a significant grouping by cue validity interaction effect on accuracy. Post-hoc tests (Tukey HSD)

showed that valid cues were significantly easier to accept for ungrouped when compared to grouped stimuli. Rejection of invalid cues showed the opposite pattern; it was significantly easier to reject them when stimuli were grouped when compared to ungrouped stimuli. These results are depicted in Figure 3.

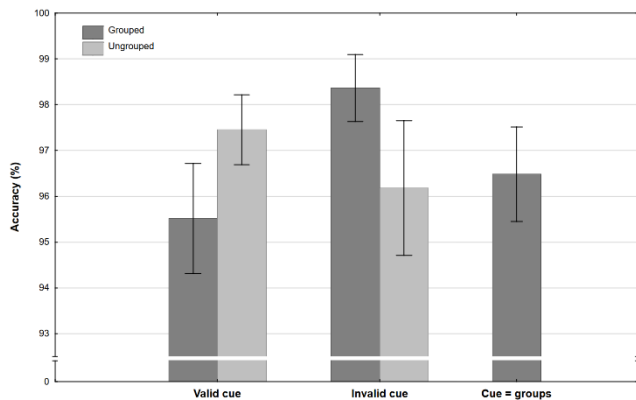


Figure 3: Mean accuracy rates as a function of grouping and cue number.

The response time ANOVA showed both main effects and the interaction were highly significant. Generally, participants were faster in the grouped condition and when accepting valid cues, but the more important result can be inferred when analyzing the interaction effect. Post-hoc analysis showed there was no difference between grouped and ungrouped conditions when accepting valid cues, but the difference was significant when rejecting invalid ones. Participants were significantly faster when rejecting invalid cues in the grouped when compared to the ungrouped condition. These results are depicted in Figure 4.

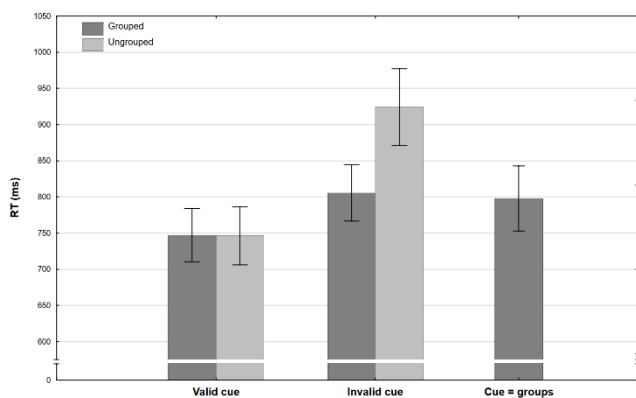


Figure 4: Mean response times as a function of grouping and cue number.

Additionally, one-way ANOVAs were conducted on accuracy and response times to determine the difference between the final condition in which the cue was equal to the

number of groups, and the remaining conditions for grouped stimuli.

There was a significant effect of cue number on accuracy in the grouped conditions ($F(2, 108) = 10.14, p < .001, \eta_p^2 = .16$), and post-hoc analysis showed this was due to significantly higher accuracy when rejecting invalid cues when compared to both accepting valid ones and rejecting cues that equal the number of groups.

The response time analysis also showed a significant effect of grouping ($F(2, 108) = 11.88, p < .001, \eta_p^2 = .18$). Post-hoc analysis revealed this was due to faster acceptance of valid cues when compared to rejection of both invalid and cues equal to the number of groups.

The invalid cues were numbers close to the actual number of stimuli and if the Webber-Fechner law applies, it would be easier to reject invalid cues when the number of stimuli were lower and more difficult when it was higher. This may affect the conclusions drawn from the previous analyses. Thus, the same analyses were conducted for trials in which there were four stimuli shown to the participants in order to better control for the segmentation difficulty. Median rather than mean response times were calculated since the number of trials per condition was reduced by half.

Table 2: ANOVA results of the effect of grouping and cue validity on accuracy and response times (RT) in 4-stimuli trials.

	Accuracy		RT	
	$F(1, 54)$	η_p^2	$F(1, 54)$	η_p^2
Grouping	3.01	.00	7.17**	.12
Cue validity	16.57**	.23	29.79**	.36
Interaction	2.06	.04	23.92**	.31

Results revealed quite a different pattern when compared to the full dataset. The accuracy ANOVA revealed only a significant effect of cue validity, which showed that accepting valid cues was more difficult in general, though this was mostly because of lower accuracy when stimuli were grouped (even though the interaction was not significant) as can be seen in Figure 5.

Response times also show a different pattern than in the full dataset, all three effects were significant but the key result is significantly faster responses when accepting valid cues when stimuli were ungrouped when compared to when they were grouped (Figure 6). Additionally, rejection of valid cues no longer depended on grouping.

Follow-up one-way ANOVAs for grouped conditions were significant for both accuracy ($F(2, 108) = 6.85, p < .01, \eta_p^2 = .11$) and response times ($F(2, 108) = 7.55, p < .001, \eta_p^2 = .12$). The accuracy pattern remained similar to the one on the full dataset; participants were more accurate when rejecting invalid cues than accepting valid ones and rejecting cues equal to the group number.

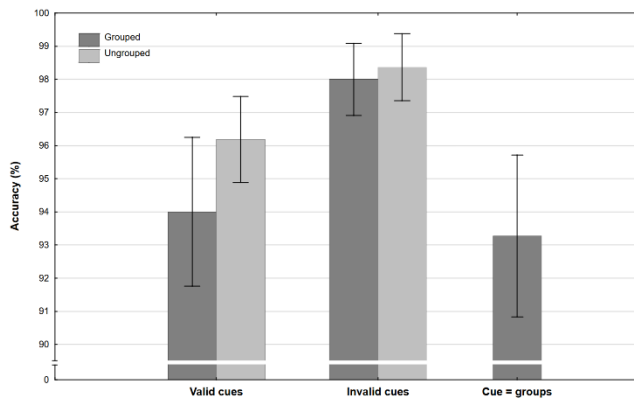


Figure 5: Mean accuracy rates as a function of grouping and cue number in 4-stimuli trials.

For response times, rejection of cues equal to the number of groups took significantly longer than both accepting valid and rejecting invalid cues.

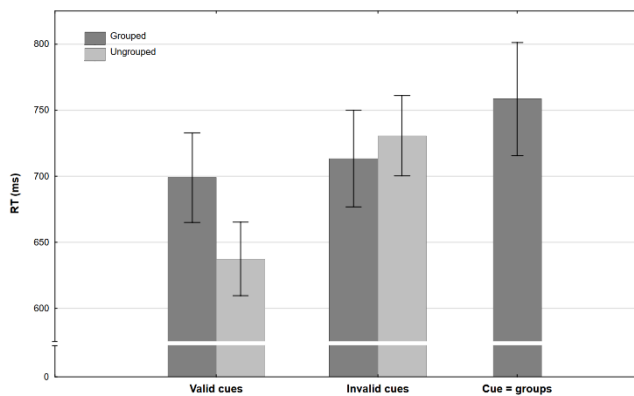


Figure 6: Mean response times as a function of grouping and cue number in 4-stimuli trials.

Discussion

The results mainly confirm that principles similar to the ones developed in the dual-processing approach to reasoning apply in visual cognition. Grouping made it easier to reject invalid cues which was reflected in both accuracy and response times. At the same time, acceptance of valid cues was reduced when stimuli were grouped though response times were not affected. Conceptually, the condition in which stimuli were grouped and the cue was invalid is fully congruent. Both the true number of stimuli and the number of groups point towards rejection of the invalid cue. Thus, the process of visual segmentation and the Gestalt grouping process congruently lead to the same decision. Indeed, participants showed highest accuracy in this condition. The remaining two grouped conditions can be considered conflict conditions. When the cue was valid stimuli segmentation pointed to acceptance but grouping pointed to rejection of the cue. When the cue was equal to the number of groups then stimuli

segmentation pointed to rejection while grouping pointed to acceptance of the cue. Both of these conditions show lower accuracy rates. The ungrouped conditions have only a single process of segmentation pointing towards acceptance or rejection.

Since the invalid cues were only slightly shifted (+/-1) from the actual number of stimuli the rejection of those cues was more difficult than acceptance of valid cues as reflected by both accuracy and response times. We further investigated how the difficulty of segmentation modulated the observed effects by analysing only trials with four stimuli. If the hypothesis that segmentation becomes more difficult with a higher number of stimuli holds, this should have led to easier rejection of invalid cues in the ungrouped condition. Additionally, it could make it easier to observe the effects of conflict between segmentation and grouping in valid cue conditions and when the cue was equal to the number of groups. This was indeed the case. Rejection of invalid cues was both easier (as demonstrated by higher accuracy) and faster in the four-stimuli trials. For these trials the conflict effects were easier to observe as well. The impact of conflict between segmentation and grouping led to lower accuracy in the 4-stimuli trials when compared to the full dataset. In totality, we can conclude that when segmentation and Gestalt processes were in conflict this led to more errors and longer response times.

This pattern follows predictions from the modern dual-process approach to reasoning when applied to this particular task. The findings indicate overlapping principles of decision making in both classic reasoning and basic visual reasoning.

While there seems to be some strong overlap in the pattern of results between these results and what is observed when using cognitive reasoning tasks (e.g. the Linda problem or the Base rate neglect task), these just scratch the surface when it comes to understanding the underlying processes. There are different levels and, presumably, different sets of processes which may overlap. The best candidate for overlap is the conflict detection and resolution system which may be common across phenomena in perception, cognition and social cognition. It has been shown that the anterior cingulate cortex plays an important role in response conflict monitoring, inhibition, and control (Carter & van Veen, 2007). Developing new tasks and paradigms and conducting research across fields (perception, reasoning, social cognition) and level (behavioral, cognitive, neural) seems like the logical step in bridging the gap between what seem similar principles of processing.

The current study is a pilot for the novel VGC task and as such has much room for improvement. The task has three basic elements – the number of stimuli, grouping, and the cue. This makes balancing and other methodological concerns difficult to tackle efficiently. Additionally, further analysis with a lower number of stimuli showed that the pattern of results is further modulated by the difficulty of the segmentation part of the task – to be more specific, the difficulty of making a decision about the cue when it should

be rejected, but is very close to the actual number of stimuli. As per the Weber-Fechner law, this becomes more difficult the higher the number of stimuli. This would also indicate that it is more difficult to induce and observe what is of most interest, the effect of congruence between grouping and segmentation processes. An interesting avenue would be to apply the paradigm with two congruent or conflicted Gestalt principles. This would presumably mean that both emerge at more comparable levels of processing.

Introducing cognitive load to reasoning tasks has been the standard method of emphasizing automatic and reducing top-down processing (De Neys, 2006; Evans, 2012). The approach is assumed to reduce Type 2 processing making responses reflect Type 1 thinking. Similar protocols can be introduced in future iterations of the task developed here through cognitive load, attention load, and short stimuli exposure times.

In conclusion, this exploratory study revealed there is indeed overlap between findings in classic reasoning and visual reasoning when a similar paradigm is applied. Participant were less accurate and slower when Gestalt grouping and scene segmentation processes led to different responses. There is still a question as to whether the similar pattern implies a high level of similarity on multiple levels of processing (response generation, conflict monitoring, detection and resolution) or is due to a single common point (e.g. a shared response inhibition system). The approach seems promising providing further refinements of testing and further investigation of possible point of overlap between the various systems.

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SOCIAL PSYCHOLOGY

Mapping students' civic identity and its link to civic engagement

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Abstract

Strong civic identity (CI), which refers to one's beliefs about his/her membership and engagement in the community, was proposed as an important predictor of civic engagement. In light of declining civic engagement among youth, empirical evidence on the respective links, especially from Europe, is lacking. We thus aimed to explore CI saliency and its relations to demographic characteristics, and establish their role in university students' civic engagement by means of regression analysis. The participants reported on their background features and civic engagement, and responded to a newly developed Multifactor Civic Identity Scale. The scale measures CI saliency across four subdomains, i.e. civic involvement, duties, rights, and membership. The CI scores showed great variability, but were largely independent of students' demographics. Higher CI saliency was linked to all measures of civic engagement (number and mean regularity of engagement in civic activities, and hours of community engagement). This suggests students are not alienated, even if civically inactive. As CI is far from mirrored in behaviour, further scholarly interest should focus on identifying factors influencing its behavioral manifestation. Even though our sample was demographically relatively homogenous, further research should look beyond demographics (and university students) to identify factors of CI development

Keywords: civic identity; civic engagement; university students; community engagement; youth participation

Introduction

One of the main developmental tasks in adolescence and emerging adulthood is identity development (Arnett, 2014). Identity develops across multiple domains, with civic identity (CI) representing one of them. CI refers to an individual's experiences, beliefs, and attitudes toward belonging, connectedness, responsibility, and inclusion in society, and to the ability to act within it (Hart, Richardson, & Wilkenfeld, 2011). It captures a set of concepts related to citizenship and the participation in civic activities, such as

voluntary activities, community assistance, participation in local and state elections, and in some cases, military service (Hart et al., 2011). An individual's CI includes three main aspects of citizenship, namely community membership, knowledge of civil rights, and engagement in civic activities (Bellamy, 2008); thus, CI is theoretically related to civic participation. However, this link and the development of CI have been understudied to date, especially in the European context.

Considering the notable decline in youth civic participation both globally and locally (Flere, Klanjšek, & Rutar, 2019), our aim was to explore whether CI is an identity domain salient – in other words prominent, important, and strong, but also readily accessible in various contexts and positively distinctive (Hogg, 2010) – in university students, who are among the most active social groups (Campbell, 2006; Perrin & Gillis, 2019). To gain some insight into potential developmental trajectories of CI, and given the literature is inconsistent regarding the relationship of demographics with the extent of civic participation (Cicognani et al., 2012; Musick, & Wilson 2008; Johnson, 2017), we further explored whether demographics are predictive of CI. Moreover, we proposed that CI saliency is linked with civic engagement among students, as salient CI is more likely to manifest in different settings.

Method

Participants and procedure

We collected the data via an online survey as part of an international collaboration on digital citizenship. Students were sampled according to the snowball principle. The sample included 202 students, of which 43,6% were men. They were aged between 18 and 28 years ($M = 21,68$, $SD =$

1,64), and were enrolled in various study programmes (35,6% in natural sciences, 38,1% in social sciences, and 17,8% in humanities). A majority of students (56,9%) semi-

resided, 36,1% co-resided with parents, and 6,9% resided out of their parents' home.

Table 1: Descriptive statistics of scores: CI saliency and separate factors of the Multifactor Civic Identity Scale, and on civic engagement measures

	<i>M</i>	<i>SD</i>	<i>Mdn</i>	<i>Min</i>	<i>Max</i>	<i>Skew</i>	<i>Kurt</i>
Involvement	4.63	1.37	4.67	1.33	7.00	-0.31	-0.84
Duties	4.54	1.39	4.67	1.00	7.00	-0.41	-0.23
Rights	5.08	1.11	5.00	1.33	7.00	-0.72	0.65
Membership	5.01	1.34	5.33	1.67	7.00	-0.70	-0.28
CI saliency	4.82	1.10	4.96	1.75	6.75	-0.67	0.01
Community eng. (hours) ^a	9.58	25.25	4.00	0	300	8.29	86.43
QCB activities ^b	7.82	5.17	7.00	0	21	0.83	-0.09
QCB regularity ^c	1.99	0.77	1.81	1.00	4.71	1.44	2.04

Notes: ^a reported number of hours of community engagement per month, ^b number of activities from the QCB the participant has ever participated in, ^c mean of participant's responses on the QCB.

Measures

We assessed CI using the Multifactor Civic Identity Scale (MCIS), developed by the first and lead author. It comprises value aspects of civic engagement, rights, duties, and membership in the community (Petrovska, 2019). The items are rated on a 7-point Likert scale (1 – strongly disagree, 7 – strongly agree). They pertain to four factors of CI identified from the literature: civic involvement (e.g., *I volunteer my time to the community*, $\alpha = .80$), civic rights (e.g., *I am willing to act for the rights of others*, $\alpha = .72$), civic duties (e.g., *I believe I have the responsibility to participate in my community*, $\alpha = .84$), and civic membership (e.g., *I take pride in being a member of my community*, $\alpha = .83$). Each factor contains three items, and the four factors load to a second ordered factor of CI saliency (a joint measure of personal importance and positive evaluation of this identity domain; $\alpha = .91$). Factorial structure of the scale in this preliminary sample was adequate ($\chi^2 = 115.24$, $df = 50$, $p < .001$, $CFI = .94$, $TLI = .92$, $RMSEA = .080$ (.063-.098),

12 items, which capture cognitive, emotional, behavioral, and

$SRMR = .059$).

Additionally, participants reported on their demographics, hours of community engagement per month, and completed a The Questionnaire on Civic Behaviour (QCB), created by the first author for the purpose of the present study. Using a 7-point scale (1 – never; 7 – very often) they assessed how often they participated in 21 (non)traditional civic activities (e.g. volunteering for a social project or charity, attending a protest or rally; see Lep et al., 2019).

Results

CI saliency, civic engagement and their relations with demographic characteristics

MCIS scores showed a great variability, and the mean scores were over the midpoint of the rating scale across the

Table 2: Summary of the differences in CI saliency and civic engagement scores across demographic groups

	Gender				Living arrangement			Study field			
	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>	<i>F</i> _(2,199)	<i>p</i>	η^2	<i>F</i> _(2,182)	<i>p</i>	η^2	
CI saliency	0.06	192.56	.10	.01	1.46	.24	.14	1.35	.26	.02	
QCB activities ^a	0.90	184.38	.37	.13	<i>F</i> _(2,181)	0.10	.91	.00	0.25	.78	.00
QCB regularity ^b	0.79	175.12	.43	.11	0.70	.50	.01	0.37	.69	.00	
Hours ^c	0.56	194.88	.58	.08	1.73	.18	.19	0.47	.62	.01	

Notes: ^a number of activities from the QCB the participant has ever participated in, ^b mean of participant's responses on the QCB, ^c reported number of hours of community engagement per month

Table 3: Results of the linear regression models predicting mean regularity and number of hours of civic engagement per month

	Mean regularity				Community engagement (hours)			
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Step 1	$(F [6,177] = 0.49, p = .82, R^2 = .02)$				$(F [6,176] = 1.05, p = .40, R^2 = .03)$			
Intercept	1.47	0.86	1.71	0.09	-27,47	29,33	-0,94	0,35
Gender (female)	-0.09	0.13	-0.69	0.49	0,80	4,31	0,19	0,85
Age	0.00	0.00	0.68	0.50	0,13	0,10	1,26	0,21
Study(nat.-soc.) ^a	0.07	0.13	0.51	0.61	-3,10	4,62	-0,67	0,50
Study(nat.-hum.)	0.10	0.16	0.60	0.55	-6,36	5,53	-1,15	0,25
Living(co-semi) ^b	0.13	0.12	1.08	0.28	7,78	4,12	1,89	0,06
Living(co-out)	0.17	0.24	0.71	0.48	-1,42	8,11	-0,18	0,86
Step 2	$(F [7,176] = 3.94, p < .001, R^2 = .14)$				$(F [7,175] = 2.10, p = .04, R^2 = .08)$			
Intercept	0.35	0.86	0.40	.69	-54.76	30.75	-1.78	.08
Gender (female)	-0.09	0.12	-0.75	.45	0.65	4.22	0.15	.88
Age	0.00	0.00	0.85	.40	0.14	0.10	1.36	.18
Study(nat.-soc.) ^a	-0.08	0.08	-1.04	.30	2.49	2.85	0.87	.38
Study(nat.-hum.)	0.06	0.08	0.80	.42	1.10	2.73	0.40	.69
Living(co-semi) ^b	-0.05	0.09	-0.58	.56	-1.16	3.33	-0.35	.73
Living(co-out)	0.01	0.09	0.10	.92	5.16	3.16	1.64	.10
CI saliency	0.24	0.05	4.93	<.001	5.04	1.76	2.86	.01

Notes: ^a Study programme (natural sciences, social sciences, humanities), ^b Living arrangement (semi-residing, co-residing, residing out of the parents' home).

CI factors and the overall CI saliency. On the contrary, the distribution of the civic engagement indicators was denser at its lower end (Table 1). Considering the demographics, all of the civic engagement indicators (number of activities, mean frequency, number of hours) were independent of age ($r_{\text{number}} = .04$, $r_{\text{mean}} = .08$, $r_{\text{hours}} = .08$, all $ps > .05$), gender, living arrangement and the field of studies. Likewise, age ($r = .01$, $p = .87$) and the other demographic characteristics considered did not associate with the CI saliency (Table 2).

Linking civic identity and engagement

CI saliency was modestly correlated with all three measures of civic engagement: number of activities ($r = .21$, $p < .001$), mean regularity in those activities ($r = .34$, $p < .001$), and number of hours of community engagement per month ($r = .23$, $p < .001$). To test the predictive power of demographics and CI saliency on mean regularity of civic engagement and hours of community service, we conducted two linear regressions (Table 3; we did not model the number of activities as scores were relatively homogenous). Neither of the models based solely on demographic predictors was significant, but the inclusion of CI saliency improved – though modestly – the prediction of both mean regularity of engagement in civic activities ($R^2 = .14$, $F_{(7,176)} = 3.94$, $p < .001$), and hours spent in community service ($R^2 = .08$, $F_{(7,175)} = 2.10$, $p = .04$). With an increase in the CI

saliency scores both the mean regularity of civic engagement and the time of engagement in community service increased.

Discussion

Contrary to considerably homogeneous low levels of the student reported civic engagement (in line with previous findings in similar samples; Lep et al., 2019) the CI saliency scores were notably more heterogeneous. Moreover, the mean scores of all of the factors were over the midpoint, suggesting most participants perceive at least some civic duties, know their rights, feel part of their community, and feel involved in it. Our findings support the importance of the civic domain of university students' identity, and warrant further scholarly interest. It seems that youth are not apathetic: they consider themselves part of the community and feel some related responsibilities. However, as many are civically inactive, this might not mean they lack CI, but rather an alienation from the current political discourse, lack of youth representation and their needs in the society, their incompatibility with traditional forms of civic engagement and/or may be attributed other factors yet to be explored (e.g., Flere et al., 2019; Cammaerts et al., 2015; Martin, 2012; Oyedemi & Mahlatji, 2016).

While the CI saliency was related to civic engagement, it contributed little to actual civic engagement. This points to the fact that CI is not reflected directly in behaviour, and suggests the involvement of other factors, which may impact this relationship. Those could include motivation for

civic engagement and behavioural intent, civic knowledge, opportunities to act, available resources to do so (e.g., time, means), and perceived feasibility of spurring change in community.

All the while, CI was not related to students' demographic characteristics under our inquiry. This could partly be due to the homogeneity of the sample (only university students, a narrow age range), but could be perhaps consistent with the notion that demographics are not key factors in determining intensity, but rather types of civic participation (Ballard et al., 2015; Gaby, 2016; Hustinx et al., 2011). In future research, it would thus be beneficial to look beyond university students, extend the age range, and include emerging adults not enrolled in education. Moreover, future studies should aim to identify factors of CI development and investigate which activities might contribute to the formation of CI in order to inform policy planning aimed at encouraging youth civic participation.

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Is the frequency of social networking sites visiting and online gaming related to life satisfaction among youth?

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Abstract

The paper analyses the relationship between the frequency of social networking sites visiting and online gaming and life satisfaction, as well as the role of sex and age in it. The data from the international *FES Youth Study in Southeast Europe 2018/2019* survey, conducted in ten Southeast European countries (including Serbia) on the representative samples of young people aged 14 to 29 years, were used, selecting those with regular Internet access (total $N = 10,532$). Both the association between the frequency of use of social networks and life satisfaction and the correlation between online gaming frequency and life satisfaction were significant, but of very low magnitude. Only the latter relationship was moderated by sex and age. The obtained results do not support the popular views on “Facebook depression” and the negative ‘effects’ of Internet use on youth well-being.

Keywords: social networking sites; online gaming; life satisfaction; youth.

Introduction

According to a current report of Datareportal, in 2020 almost 4.7 billion people worldwide (59% of the global population) are active Internet users. For the first time in history, more than half of the world uses social media.⁴

More and more time is spent on the Internet (e.g. Smahel et al., 2020). If we look at Serbia only, as many as 80% of young people aged 15-29 spend 3 hours or more a day on the Internet (Popadić, Pavlović & Mihailović, 2019). During the pandemic, the time spent behind the screen is certainly much longer both in Serbia and in the world. The more important the Internet is in our lives, especially in the lives of young people, the more important are the questions about the consequences of its use. These questions have been asked and answered for nearly thirty years. The concerns over Internet use and warning messages are mostly voiced, at least in the mainstream media.

Certain forms of online activities, especially the use of social networking sites (SNS) and playing online games, have generated heightened concerns because of the indications that they might be associated with various internalizing and externalizing problems among youth. There are warnings that SNS use is negatively associated with subjective well-being and positively associated with symptoms of depression (so-called Facebook depression),

especially among girls (e.g. Chou & Edge, 2012; Cross et al., 2013; Kelly et al., 2019; Selfhout et al., 2009). Some authors have warned that computer game playing may lead to addiction and increased aggression (e.g. Grüsser et al., 2006; Ng & Wiemer-Hastings, 2005). Yet, others have failed to confirm these associations or found them to be of very low magnitude and practically insignificant (e.g. Király et al., 2017; Orben & Przybylski, 2019). Overall, numerous studies in which the mentioned variables were operationalized in various ways have yielded contradictory results.

One meta-analysis of 121 studies (Saiphoo et al., 2020) has reported a small, negative and significant link between the SNS use and self-esteem. This finding should nevertheless be taken with a grain of salt. The overall correlation in question is extremely low ($r = -.079$) and its significance is due to a very large sample ($N=91,462$). Secondly, the strength of negative association was dependent on the measures used in the study. In studies that deployed the problematic use of the Internet, negative correlation was more intense, $r = -.184$, $p < .001$. When the simple amount of time spent on SNS was used, the correlation with self-esteem was only -0.045 , $p < .01$, although still significant.

The subject of this paper is the analysis of the way in which the frequency of using SNS and online gaming is associated with one aspect of subjective well-being, namely, life satisfaction. We also probed for the moderating role of sex and age in these relations.

Method

Participants

The study is based on data from the international investigation *FES Youth Study in Southeast Europe 2018/2019*, conducted in ten countries of Southeast Europe (including Serbia) on nationally representative samples of respondents aged 14-29.⁵ Our sample size, after excluding those who do not have regular access to the Internet, was $N = 10,532$ (49.9% females, mean age $M = 21.7$, $SD = 4.5$).

Data

The data were collected by face-to-face interviews in early 2018. The frequency of using social network sites and playing online games was assessed on three-point response scales (1 – Never / 3 – Often). Satisfaction with

⁴ <https://datareportal.com/reports/digital-2020-july-global-statshot>

⁵ <https://www.fes.de/en/youth-studies>

life was measured by one question followed by a five-point scale (1 – very unsatisfied / 5 – very satisfied).

Results

The zero-order (Spearman’s rho’s) correlations between the overall satisfaction with life and the frequency of online gaming and frequency of visiting SNS are given in Table 1.

The results indicate that the relationship between the frequency of SNS use and life satisfaction is positive and significant, but of very low strength. The magnitude of correlation varies across the countries and ranges from -.006 (Romania, the only case of negative association) to .104 (Croatia). In the sample of Serbian youth (N=1,062, 51.5% females, mean age $M = 22.2$, $SD = 4.3$), these measures were not significantly correlated.

Table 1. Correlations of life satisfaction with frequencies of gaming and visiting SNS

		Gaming	Social networking sites
10 countries	All	-.035**	.040**
	M	.009	.046**
	F	-.051**	.032**
Serbia	All	-.021	-.009
	M	.077	.009
	F	-.069	-.043

** $p < .01$

The relationship between the frequency of online gaming and life satisfaction is negative and significant, but of equally low magnitude. The correlations range across the countries, from .090 in Albania, to -.084 in Croatia. In seven out of ten countries, the correlation sign is negative. That is the case in Serbia as well, but the correlation is not significant.

In order to test whether the relationship between the life satisfaction and two online activities is dependent on sex and age, we performed a series of multiple regression analyses with the aim of testing the significance of the interaction terms of age/gender and SNS/online gaming.

Regression analyses show that neither age nor gender moderate the relationship between life satisfaction and SNS. But the interaction terms of both playing games and gender ($\beta = .11$, $p < .05$) and playing games and age ($\beta = -.16$, $p < .01$) are significant. The negative relationship between life satisfaction and online gaming is more pronounced among girls (Figure 1) and older age (Figure 2).

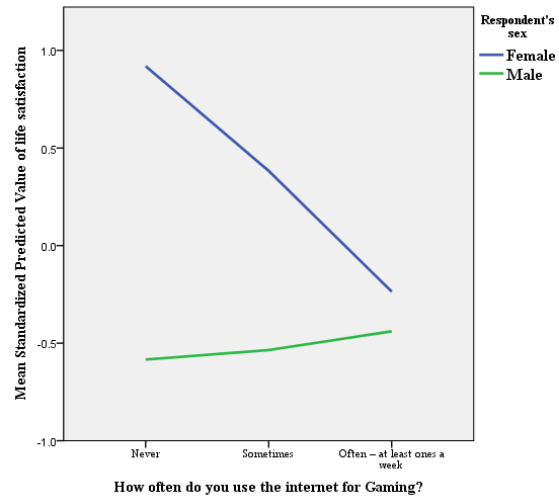


Figure 1: Standardized predicted values of life satisfaction by sex and frequency of online gaming.

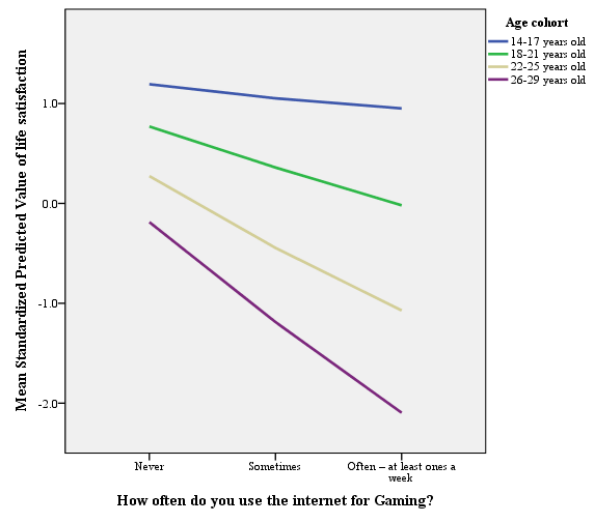


Figure 2: Standardized predicted values of life satisfaction by age and frequency of online gaming.

Discussion

The results as a whole do not provide a basis for the popular theses about “Facebook depression” and the negative ‘effects’ of using the Internet on the psychological well-being of young people. More specifically, our results indicate that those young people who use SNS more often report *higher* general life satisfaction, while playing games is negatively correlated with life satisfaction, especially among girls and young adults. However, these correlations, significant owing to extremely large sample size, are very low and bear little practical significance.

Since we believe that it does matter how one spends the hours of one’s everyday life, we will repeat what has already become commonplace – what is important is the way of using the Internet, and not just the amount of time spent online. The effects probably depend on the motivation with which someone plays games or uses SNS, as well as on the specific content these activities are filled with. Yet, it is possible that some negative ‘effects’ are more closely associated with intensive (time spent online)

and others with excessive internet use (i.e. problematic Internet use) (Popadić, Pavlović & Kuzmanović, 2020).

Our results have some limitations that are typical for the analyses of large-scale survey datasets (cf. Orben & Przybylski, 2019). One is the ease with which small associations can be identified as significant. Additionally, variables are measured by one-item indicators with a rather small number of categories. Cross-sectional design can reveal the association between the variables but not the directions of 'influence' and cannot account for the possibly confounding factors. In regard to the correlation between online gaming and life satisfaction, it remains unclear whether those who are more dissatisfied with life more often seek refuge in such activities, or these activities negatively affect young people.

In the end, we would like to draw attention to something not related to our data only, but to the majority of studies in the field. It seems that self-assessments are becoming increasingly inadequate as measures of the time spent on the Internet or using specific applications. Asking young people how much time they spend online seems to be the same as asking them for how much time they use electricity per day. In the future, we will have to search for the answers to such questions from the devices themselves, and thank the respondents for their cooperation so far.

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The Socio-Psychological "Infrastructure" of Conflict in Croatian, Bosniak and Serbian History Textbooks - Comparing 1996 to 2017

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Abstract

The so-called "socio-psychological infrastructure of conflict" (SPIC, Bar-Tal, 2007), as a shared cognitive-affective repertoire, psychologically prepares groups for participation in the conflict. The same repertoire, however, poses an obstacle for reconciliation after its resolution. Relying on SPIC as an analytical framework, we compared Croatian, Bosniak and Serbian elementary school history textbooks published immediately after the war (1996) and twenty years after (2017). First, we sampled the textbooks, choosing the most widely used ones in each period. In selected textbooks, we identified chapters that mention relations among three ethnicities. We proceeded to split them into paragraphs as units of analysis (N=945). Two independent coders classified each paragraph according to nine categories. Results showed that 1/3 up to more than 1/2 of all the selected paragraphs were indicative of SPIC. Contrary to our expectations, we did not observe a significant decrease in SPIC in post-war textbooks, even when we separately analyzed only the categories identified as key obstacles towards reconciliation. We discuss how SPIC integrated into national historical narratives across ethnicities as its core element and why the societies need to enhance their effort towards developing socio-psychological foundations of peace.

Keywords: history textbooks; intergroup relations; Yugoslav conflict; socio-psychological infrastructure of conflict; reconciliation

Introduction

The violent dissolution of Yugoslavia (1991-1995) included gross violations of international humanitarian law through ethnic cleansing, concentration camps, paramilitary formations (Radović, 2004), which resulted in more than 120 000 victims and more than 2.5 million of refugees (Koulouri & Repe, 2018). The consequences of the conflict still burden societies since questions regarding the number of victims (Radović, 2004), state borders (Karabeg, 2016) and the responsibility of war (Forum za Tranzicionu pravdu [Forum for Transitional Justice], 2015) remain open, while inflammatory rhetoric often permeates public and political discourse (e.g. Janjić & Šovanec, 2018).

According to Bar-Tal (2007), to meet the challenges of conflict, societies develop a cognitive-affective repertoire that includes shared beliefs, attitudes, motivations, and emotions that ultimately transforms into a *socio-psychological infrastructure of conflict* (SPIC). Although SPIC enables societies better adaptation to conditions of

war, it is also the main obstacle towards the reconciliation after the violence has officially terminated. The cognitive basis of SPIC consists of societal beliefs that are focused either on the past (*collective memories*) or present (*ethos of conflict*), and that are related to the following themes: *justness of own goals, delegitimization of the rival, victimization, abstract peace, security, positive ingroup image, patriotism, national unity*. While the first four societal beliefs are the key obstacles towards reconciliation, others are common even in peaceful times, although in a more complex form (Bar-Tal, 2000). Regarding the affective aspect of SPIC, Bar-Tal (2007) discusses collective emotional orientation as a model emotional response that is widespread throughout the society, and that is mostly related to emotions of fear, hate and revenge. As violent confrontations between groups progress, SPIC gets disseminated and institutionalized via societal channels of communication.

In our work, we focused on one of the most influential societal channels of communication - elementary school history textbooks. Their importance stems from (Bar-Tal, 1998): a. being state-controlled official narratives of the conflict; b. targeting still developing youth as future citizens; c. representing epistemic authorities; d. having an extensive reach due to compulsory education.

Therefore, our main research goal was to determine the presence and change of SPIC in Bosniak, Serbian and Croatian history textbooks just after the war (1996) and in contemporary times (2017). We expected a lower presence of SPIC in the "contemporary" textbooks (2017) than in the "war" textbooks (1996), especially for those elements which are regarded as the key obstacles towards reconciliation. We based such prediction on previous studies (Bar-Tal, 1998; Bar-Tal, 2000; Nasie & Bar-Tal, 2012), where authors argued that withdrawal of SPIC from the societal channels of communication should follow de-escalation of the conflict.

Method

Considering we used content analysis, the sampling procedure had two stages. First, we sampled the most widely used history textbook for each ethnicity and each

time moment (see Appendix). For 1996 there was only one history textbook per ethnic group, while for 2017 we selected the textbooks referred to at national ministries of education websites. Second, within the sampled textbooks, we selected chapters that included the relation of at least two out of three relevant ethnic groups. As a unit of analysis, we chose one paragraph of text within selected chapters (total number of paragraphs per textbook: $N_{C96} = 226$; $N_{S96} = 184$; $N_{B96} = 217$; $N_{C17} = 128$; $N_{S17} = 110$; $N_{B17} = 80$).

Two independent coders analyzed paragraphs according to each of the nine categories (Table 1)⁶. Inter-rater agreement was ranging from 89% to 98% of all cases depending on a category. However, as a large number of zeroes could inflate the agreement coefficient, we used more conservative Krippendorff alpha which is more robust to category absence (Krippendorff, 2004). It ranged from .37 to .74. The lowest reliability was for the categories that were the least frequent, whereas the most frequent had the highest reliability. Nevertheless, to ensure the validity two coders settled each disagreement through discussion based on guidelines that we determined in the training process (available at [OSF](#) repository).

Table 1: Coding scheme

Elements of SPIC
Justness of own goals
Delegitimization of the rival
Security
Victimization
Positive ingroup image
Patriotism
National unity
Abstract peace
Collective emotional orientation of fear, hate and revenge

Key obstacles to reconciliation are bolded⁷

Results

As detailed in Table 2, we observed strong presence of SPIC in history textbooks of all three ethnicities, varying from 1/3 to more than 1/2 of all analyzed paragraphs. Our expectation that SPIC would decrease in contemporary textbooks was not supported by the data. In fact, with the exception of Bosniak textbooks, we even identified a trend towards an increase, but none of these changes reached statistical significance (Croatian: $\chi^2(1, 354) =$

⁶ Examples for each of the categories from the coding scheme are available at [OSF](#) repository, together with the database, inter-rater agreement and category percentages.

⁷ Unlike in the original article (Bar-Tal, 2000), we omitted abstract peace due to low frequency and added security due to intense emphasis on threats to national existence and culture.

1.69, $\phi = .07$, $p = .19$; Serbian: $\chi^2(1, 294) = 1.50$, $\phi = .07$, $p = .22$; Bosniak: $\chi^2(1, 297) = .20$, $\phi = -.03$, $p = .65$). Notwithstanding this, the exact number of SPIC related paragraphs decreased in contemporary textbooks, but due to the reduction in content rather than withdrawal of SPIC.

We proceeded to test if elements of SPIC which are the key obstacles to reconciliation decreased, bearing in mind that some elements also exist in the times of peace. In contrast, across ethnicities we again observed a trend towards an increase (Table 3) (Croatian: $\chi^2(1, 354) = 3.65$, $\phi = .10$, $p = .06$; Serbian: $\chi^2(1, 294) = 1.19$, $\phi = .06$, $p = .28$; Bosniak: $\chi^2(1, 297) = .06$, $\phi = .02$, $p = .80$).

Table 2: Percentage of at least one element of SPIC in all selected paragraphs per history textbook and time moment

	Time moments	
	1996	2017
History textbook		
Croatian	52.2% (118)	59.4% (76)
Serbian	32.1% (59)	39.1% (43)
Bosniak	47.9% (104)	45% (36)
Total	44.8% (281)	48.7 (155)

Exact number of paragraphs in brackets

Table 3: Percentage of at least one key obstacle to reconciliation in all selected paragraphs per history textbook and time moment

	Time moments	
	1996	2017
History textbook		
Croatian	43.4% (98)	53.9% (69)
Serbian	23.4% (43)	29.1% (32)
Bosniak	39.6% (86)	41.3% (33)
Total	36.2% (227)	42.1 (134)

Discussion and conclusion

By showing that SPIC hasn't decreased in history textbooks more than 20 years after the war, our study suggests that such "ideology of conflict" became integrated into national historical narratives of former belligerents as its core element. This finding is in line with several previous comparative textbook analyses, in which the authors demonstrated how ethnocentric narratives introduced in the '90s consolidated through time (Forum za Tranziciju pravdu [Forum for Transitional Justice], 2015; Pavasović Trošt, 2018). However, the same authors also note that language got moderated and that textbooks did improve. Although our coding scheme wasn't sensitive to detect subtle differences in language intensity, coders observed such moderation through time. Also, we identified other indicators of progress as well - e.g. the content is reduced in favour of more didactic support.

Although three ethnicities currently live in peace, our work raises awareness about the issue of integrating SPIC in educational materials of future citizens, who as a consequence grow up epistemically and psychologically

ready for the conflict (Žeželj & Pratto, 2017). In that sense, we agree with the warning of Bar-Tal and Čehajić-Clancy (2013, p. 128) that "old national elements of collective memory and other national credos do not disappear but are held, transmitted and lie dormant within families and other ethnic institutions. These elements are ready to be reawakened when needed by societal, political and cultural forces".

Thus, it is necessary to work towards developing "sociopsychological infrastructure of peace" by changing beliefs and attitudes which are the key obstacles to reconciliation, while making the others more multidimensional, complex and open to criticism. Bearing in mind that elements of SPIC are well-founded in societies, we hope future studies would expand on reconciliation practices and their implementation, especially with regard to the educational system as an essential socialization tool.

Appendix

History textbooks

(Croatian):

Perić, I. (1996). *Povijest za VIII. razred osnovne škole* (1. izd.). Zagreb, Hrvatska: ALFA.

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Deriving a Typology of Political Extremism among the Youth in Bosnia and Herzegovina

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Abstract

A long history of interethnic and interreligious violent conflicts, together with a transition economy riddled with corruption and an unstable political situation make Bosnia and Herzegovina a fertile soil for extremist political ideologies. Our study aimed to explore the prevalence of political extremism among the youth by using a typological approach. We collected valid responses from 982 participants (18-30 years, 56.2% male) throughout Bosnia and Herzegovina. We employed latent profile analysis on a set of 20 items substantively related to extremist ideologies (e.g. apology of violence, dogmatism, anger about societal injustice). Statistical measures (information criteria), theoretical considerations, and relations with three selected external variables (social dominance orientation, authoritarianism, exposure to violent environment) suggested the optimal solution with five classes we labeled as: potential extremists (25.7% of the sample), at-risk of radicalization (19.8%), doomsday reluctants (36.4%), pessimistic pacifists (14.5%), and optimistic pacifists (3.8%). We argue that a typological approach provides a valuable insight to researchers and policymakers into the dynamics of challenged political communities.

Keywords: political extremism; youth; Bosnia and Herzegovina; latent profile analysis; typology.

Introduction

Fortunately or not, Bosnia and Herzegovina (B&H) is an inspiring country for researching political extremism (PE). Throughout its recent history, radical political ideas were practiced by its inhabitants, which frequently culminated in armed conflicts. The ruling and rebelling ideologies ranged from various ethno-religious to a communist one. The well-known violent episodes related to B&H were the assassination of Franz Ferdinand which triggered the First World War, and a civil war with more than 100 000 deaths during the 1990s. Today, B&H is formally a democratic society but with many structural issues, ranging from corruption to massive emigration (Brezar, 2020), “with extremist ideologies and regional nationalist groups remaining potential sources of terrorism” (U.S. Department of State, 2020).

Within the scope of our study, we defined political extremism as a mindset characterized by condoning and supporting violence towards specific political agent group(s) as a necessary means to systematically improve a society perceived as morally challenged. Indeed, there are several established approaches to researching political extremism from a psychological perspective (e.g. Militant Extremist Mind-Set by Stankov et al., 2010 or Significance Quest Theory, Kruglanski et al., 2017). However, these approaches emphasize dimensional, variable-centered models, which can fall short in

providing a sincerely interested reader with a straightforward description of qualitatively distinct multivariate interactions among relevant variables. Therefore, we wanted to develop a person-centered typology of political extremism that would be more insightful both for researchers and policymakers.

Method

Measures

After reviewing relevant literature and extant extremism measures (e.g. following the approach by Hart et. al., 2017 regarding the assessment of terrorism) we identified 20 different aspects constituting an extreme political mindset incompatible with the values of liberal democracy (e.g. “lack of belief in democracy”, “belief in an ideal society”, “necessity of armed actions to establish a moral society”, “supporting violent groups dedicated to improving a society”, “accepting personal responsibility for future forceful activities”), each of which we worded as a single statement with a five-point response scale. The administered battery of measures also included abbreviated scales – derived by using Genetic Algorithm procedure (Yarkoni, 2010) on data from our previous research – of relevant external variables: social dominance orientation, authoritarianism, and exposure to violence in one’s environment (e.g. familial violence, street fights).

Participants and procedure

Data were collected anonymously during the first half of 2019 at schools and universities throughout B&H. The final sample consisted of 982 valid responses with no missing values on 20 PE items. The age range of our respondents was from 18 to 30 years ($M = 20.4$, $SD = 2.9$, $Mdn = 19.0$), while the slight majority were male (552, 56.2%). The sample was adequately balanced when it comes to the two largest ethnicities in Bosnia and Herzegovina (48.5% Bosniaks and 41.9% Serbs).

Data analysis

We conducted an exploratory factor analysis (EFA) on a matrix of polychoric correlations to investigate the factorial structure of our instrument. One item aside (“lack of belief in democracy”), the EFA suggested that a two-factor solution ($r_{F1-F2} = .23$) fits the data well with a straightforward simple structure. The first factor (F1) referred to the necessity of employing violent means to repair a society, while the second factor (F2) referred to an imminent collapse of an ethical society.

Nevertheless, to establish a typology we did not pursue the usual analysis based around sum scores, but we employed latent profile analysis (LPA) on the individual items. To determine a final number of classes we considered both statistical (information criteria measures, the minimum average probability of case classification, the degree of classification certainty) and substantive criteria (theoretical interpretability of solutions, discriminatory power related to external variables) by testing a number of potential solutions, ranging from 1 to 10 classes.

All analyses were conducted by using R packages psych (Revelle, 2019), mclust (Scrucca et al., 2016), and BayesFactor (Morey & Rouder, 2018) with the default priors.

Results

The majority of information criteria (e.g. BIC, CAIC, and ICL) pointed to a five-class solution. This solution was theoretically interpretable, accompanied by a high average posterior probability of classification for the least determined class (0.86) and a satisfactory entropy measure of overall classification certainty (0.84).

The distinct profiles differed significantly on every PE item ($p < .001$, $BF_{10} > 100$), but due to space constraints, we depict the profiles by using the sum scores (which were not used in the LPA) on two identified factors and three external variables (Figure 1). One-quarter (25.7%)

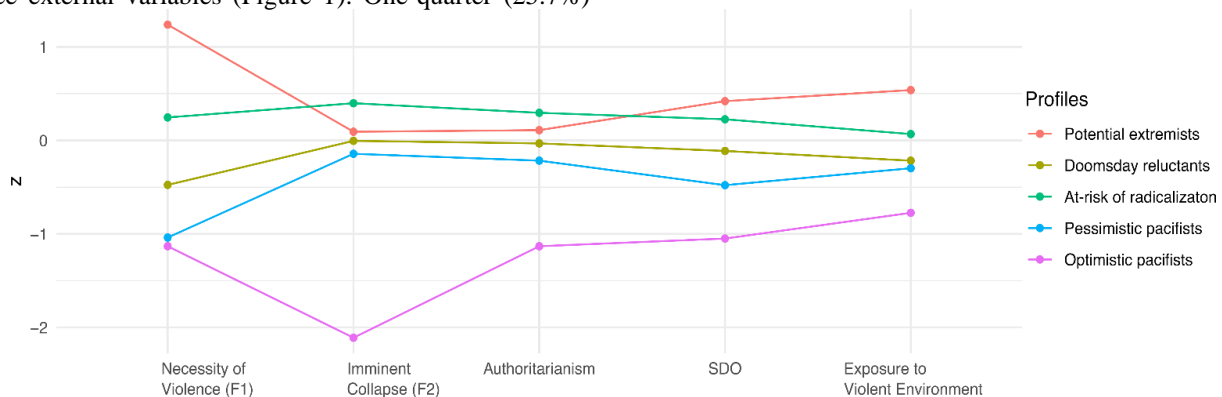


Figure 5: Standardized average scores disaggregated by the latent profiles.

Discussion

The five-class typology we obtained was statistically distinct and substantively corroborated. Alas, the suggested prevalences of different types do not offer a comforting image; a vast proportion of the young see B&H society as a deeply corrupted society with almost half of the respondents approving of some sort of violent actions as a justified path to regain a right course.

That said, we are well aware of the limitations of our model. First of all, the stability of models is always dependent on input data (i.e. number of selected items and their content). We attempted to cover numerous aspects of political extremism, but we purposefully decided to leave out items that could have discriminated among different political ideologies (e.g. left-right political agendas or religious beliefs). Second, although anonymous surveys

of our respondents were classified as *potential extremists* which, on average, agreed moderately with most of the PE items. Additionally, every fifth respondent (19.8%) we labeled as *at-risk of radicalization* since they supported violent political actions to a small degree, but they also clearly tended to view themselves as potential political agents in improving the corrupt society. The largest group, accounting for more than one-third of respondents (36.4%), we described as *doomsday reluctants*. They perceived the level of the moral corruption of the society to a similarly large degree as two former groups, but there was only a budding inclination in personal engagement and they largely disapproved of violent actions. The fourth group (14.5%) – *pessimistic pacifists* – shared the negative view of the moral stand in the society, but they both completely disapproved of violent political acts and their motivation to get personally involved was practically nonexistent. Finally, only 3.8% of the respondents were described as *optimistic pacifists*, who – apart from disapproving of violent actions – perceived societal tendencies in an overwhelmingly positive light.

The classes also differed noticeably on external variables: social dominance orientation ($F(4, 963) = 37.70$, $p < .001$, $BF_{10} > 1000$, $\eta^2 = .14$), authoritarianism ($F(4, 969) = 19.97$, $p < .001$, $BF_{10} > 1000$, $\eta^2 = .08$) and violent environment ($F(4, 970) = 35.59$, $p < .001$, $BF_{10} > 1000$, $\eta^2 = .13$).

provide an opportunity for participants to freely express their views on socially sensitive matters, we do not know whether participants distortedly reported their attitudes either by exaggerating them in the anonymous context or by attenuating them for some cautious reason. That we had to opt for a convenience sample partly made of university students just further limits confidence in viewing our model as a fully accurate image of the context. We also have to emphasize that there was a significant variability within the types, and that we cannot predict whether obvious angry attitudes that many young participants expressed will be ultimately used as a fuel for violent political actions, for their democratic political engagement, or just for the decision to migrate from B&H.

In spite of the limitations, we believe that we provide a valuable glimpse into the violence-related political

attitudes of youth in a challenged society within Europe. Besides, we suggest that employing a person-centered model – at least as a supplementary analysis – offers a comprehensible estimate of both the character and prevalence of relevant mindsets which can be better understood and acted upon by both researchers and policymakers.

Acknowledgments

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Active and restrictive parental mediation as the predictors of adolescents' excessive Internet use

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Abstract

The aim of this paper is to analyse the relevance of parents' active and restrictive mediation of children's online behaviour. The data collected in 2018 in the EU Kids Online survey in Serbia on a nationally representative sample of children aged 9 to 17 years ($N = 1,150$) were used. The SEM model is used to test the possible relationships between parental strategies and excessive internet use (EIU) by examining the paths from active/restrictive practices to EIU (1) through limiting the time spent online and (2) through increasing digital skills. The analysis has shown that both active and restrictive parenting lowers EIU by reducing the time spent online. Restrictive mediation is more strongly related to lowering the time spent online, but, unlike active parenting, it decreases children's digital skills as well.

Keywords: Excessive Internet Use; Active mediation; Restrictive mediation; adolescents; Serbia.

Introduction

The Internet has a decisive role in the lives of adolescents these days. A recent PEW study found that 95% of adolescents in the USA have access to smartphone, and half of them report that they are almost constantly online (PEW, 2018). Great availability of the Internet and the imperative to be online "all the time" often leads to negative consequences. Internet use is sometimes characterized by compulsiveness, lack of control, the feeling of guilt and conflicts with family and friends, described in the literature as Excessive Internet Use (EIU) (Kalmus, Blinka, & Ólafsson, 2015). EIU has been intensively studied in recent years (Kalmus et al., 2015; Šmahel & Blinka, 2012; Kuzmanović et al., 2019; Popadić et al., 2020) and great efforts have been put into the identification of factors that can prevent EIU.

Parents' role in preventing EIU can be very important (Durke et al., 2012; Kalmus et al., 2015; Šmahel et al., 2012; Popadić et al., 2020). They can actively mediate children's online behaviour by encouraging and instructing safe Internet use, jointly browsing the Internet with children etc. This could even increase the time spent online, and as such, the opportunities for online learning, which helps develop digital skills. Parents, alternatively or simultaneously, can take a more passive and restrictive role – they can set rules on what can be done on the Internet, when, with whom and for how long. These restrictions could limit the time spent online, but discourage the digital skills development as well. Thus, these two mediation strategies could "prevent" EIU differently, and in two main ways: by determining the

amount of time that children spend online and/or dis/encouraging the children's digital skills.

This study is aimed at analysing the role of parental mediation practices in adolescents' EIU. More specifically, research aims are to analyse the relationships between parental strategies and EIU by examining the paths from active/restrictive practices to EIU (1) through limiting the time spent online and (2) through increasing digital skills.

Method

Participants

The study was conducted on a random, multistage stratified sample of students, representative of the school population aged 9-17 and in four major statistical regions in Serbia (Belgrade, Vojvodina, Eastern and Southern Serbia, Šumadija and Western Serbia). One class of students from 40 primary and 20 secondary schools was randomly sampled. The sample included 1,150 children in total (52% girls). Children older than 10 are included in this analysis ($M = 14.30$, $SD = 1.87$).

The data were collected in 2018 in the EU Kids Online survey in Serbia (Kuzmanović, Pavlović, Popadić & Milosevic, 2019) via pen-and-paper questionnaires that were administered in schools. Children answered them individually during classes.

Variables and measures

The questionnaire used in the study included a large number of variables. Some of them were included in the present analysis.

Restrictive mediation. Nine questions probing for the presence of restrictive rules in the family regarding the Internet were used as a measure of restrictive mediation ($\alpha = .90$). The children were asked (e.g. 'Are you allowed and do you need parent's permission to visit social networking sites?') whether they were allowed to do certain things such as using a webcam, downloading music or visiting a social networking site (1) anytime, (2) only with permission or supervision, or (3) never. Higher values on this measure imply more restrictive parental practices.

Active mediation. It was measured by eleven questions ($\alpha = .89$). Children were asked how often (1. never / 5. very often) their parents encouraged them to explore and learn things on the Internet or suggested the ways to use the Internet safely (e.g. 'How often does your parent encourage you to research and learn new things online?'). Higher values imply more active mediation.

Time spent online. Children were asked to estimate the number of hours they spent online during a school day and on weekends. The answer categories ranged from (1) *little or no time at all* to (9) *seven hours and more time*. The answers to two questions were averaged and treated as a measure of time spent online.

Digital skills. The assessments of 21 things that children knew how to do online were used as a measure of digital skills. On a scale from 1 to 5, where 1 stands for *not at all true of me* and 5 stands for *very true of me*, children were asked to answer how (un)true of them were different statements (such as ‘I know how to save a photo that I find online’) ($\alpha = .91$). Higher scores imply being more skilful.

Excessive Internet Use. A seven-item scale covering various indicators of EIU was used ($\alpha = .84$). Children were asked to evaluate on a four-point scale (1. never / 5. daily or almost daily) how often they (1) went without eating or sleeping because of the Internet; (2) felt bothered when they could not be on the Internet; (3) caught themselves using the Internet although they were not really interested; (4) spent less time with either family, friends, or doing schoolwork because of the Internet; (5) tried unsuccessfully to spend less time on the Internet; (6) experienced conflicts with the family or friends and (7) thought the amount of time spent on the Internet caused problems for them. Higher scores indicate more prominent EIU.

Results

Correlations between the variables included in the analysis are given in Table 1. All relationships are significant and in the expected directions.

Table 1: Intercorrelations between the included variables

	Active Mediation	Restrictive Mediation	Time online	Digital skills
Restrictive Mediation	.30**			
Time online	-.23**	-.43**		
Digital skills	-.11**	-.51**	.30**	
EIU	-.16**	-.19**	.34**	.11**

* $p < .05$, ** $p < .01$.

The tested model showed a satisfactory fit, $\chi^2(3) = 14.63$, $p < .01$, RMSEA = .07, CFI = .98). Total effects showed that both active and restrictive practices led to lower EIU (Table 2)⁸.

Table 2: Path model with standardized coefficients of active and restrictive mediation on EIU.

Predictors	Indirect effects via the time spent online	Indirect effects via digital skills	Total effects
Active mediation	-.04*	.00	-.04*
Restrictive mediation	-.14**	.00	-.14**

Predictors	Indirect effects via the time spent online	Indirect effects via digital skills	Total effects
Active mediation	-.04*	.00	-.04*
Restrictive mediation	-.14**	.00	-.14**

* $p < .05$, ** $p < .01$.

Both active and restrictive parenting ‘lower’ EIU primarily by reducing the time spent online, which is positively related to the EIU (Figure 1). Compared to the active one, restrictive mediation is more strongly related to lowering the time spent online, thus making it a more important predictor of EIU. Still, unlike active parenting, restrictive parental practices decrease the children’s digital skills as well, making adolescents less digital savvy at the same time.

The relationship of parental practices and EIU is not mediated by adolescents’ digital skills.

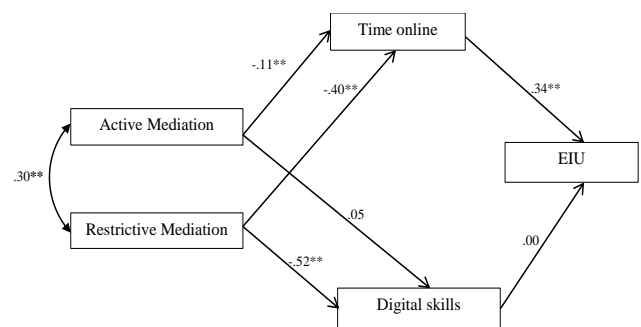


Figure 1: Path model with standardized coefficients of active and restrictive mediation on EIU.

Discussion and Conclusion

Data presented in this paper support numerous previous studies that have shown the important role of parental internet-related practices in preventing EIU among adolescents (Durke et al., 2012; Kalmus et al., 2015; Kuzmanović et al., 2019; Šmahel et al., 2012; Popadić et al., 2020). Simply put, parents’ involvement in children’s online experiences does matter.

The research design of this survey was cross-sectional and the treatment of EIU as the ‘effect’ of parental practices should be taken with caution and in statistical terms. Still, two main conclusions can be made. Limiting the amount of time spent online is a more important mechanism of EIU prevention than building digital competencies in adolescents. In addition, due to it being more strongly (negatively) related to the time spent online, restrictions regarding the Internet use that parents make proved to be more important than active instruction in safe Internet use. Strictly speaking, EIU is more related to the patterns of Internet use and real-life consequences than to online experiences *per se*. It is thus understandable that the rules of Internet use and time limitations are of greater relevance. Active mediation could have a more important role in the cases of bothering experiences online, as previous research has already shown (Šmahel et al., 2012).

It is important to stress the relative unimportance of adolescents’ digital skills for EIU, as well as its specific

⁸ We tested only the significance of the hypothesized indirect paths.

relationship with parental practices. Active mediation is not related to it, while the presence of Internet restrictions is accompanied by a lower level of digital skills. Although clearly useful in minimizing EIU, restrictive mediation can be viewed as a disservice in some other sense. It clearly makes children/adolescents less digital savvy.

In that regard, future research would benefit from a more detailed analysis of the role of digital skills for EIU, primarily in terms of possibly moderating effects of children's age. On the other hand, parental role in children's online behaviour is dependent not just on active and restrictive mediation, but possibly on their own digital skills as well.

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Civic education and the acceptance of democratic values: The role of participatory class climate

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Abstract

The aim of this paper is to analyse the relevance of participatory class climate for the acceptance of democratic values among Serbian students who attend the civic education courses and to analyse the moderating role of students' socio-economic status. The data collected in the CE evaluation study (N = 1073, 42% of boys) were used. Multiple regression analysis has shown that democratic values are more embraced by the students of higher SES and those from the classes with a more prominent participatory climate. The relationship between PCC and the importance of democratic values is moderated by SES: the students with the lowest SES gained most from class participation in terms of accepting democratic values.

Keywords: Civic education; Participatory Teaching Methods; Participatory Class Climate; Values; Serbia.

Introduction

Civic education (CE) courses are often viewed as an important agent of political socialization, a 'school of democracy', which should enable and support the building of students' democratic competencies of active and critical citizenry. Based on the idea that democracy struggles if its main values and norms are not supported by well-informed citizens, CE is expected not just to increase political knowledge (e.g. of a political institution, processes, freedoms and human rights), but to enable the development of a more general democratic outlook (e.g. by promoting active involvement in one's society and democratic norms and values).

CE is indeed relatively successful in the transmission of the knowledge-related civic lessons. Numerous studies have shown that CE courses can be successful in increasing the students' (political) knowledge (e.g. Finkel & Ernst, 2005; Denver & Hands, 1990; Morduchowicz, Catterberg, Niemi & Bell, 1996; Baucal et al., 2019; Pavlović et al., 2020; Niemi & Junn, 1998; Tourney-Purta et al., 2001). Yet, the promotion of participatory attitudes, values and behaviours proved to be a much harder task, which CE courses often fail to accomplish (Baucal et al., 2009; Finkel & Ernst, 2005; Niemi & Junn, 1998; Ichilov, 2007; Pavlović, 2012).

It is often argued that a mere "exposure" to CE "messages" is not sufficient for the attitude and value

change or acquisition. The development of such an orientation is, in theory, dependent on the teacher's credibility, active teaching methods and supportive climate (Finkel & Ernst, 2005; Ichilov, 2007; Morduchowicz et al., 1996). The context (open class climate) and teaching methods (participatory methods) serve as its precondition. Additionally, the CE courses, in general, or class and school social "texture", in specific, could be of more relevance for some students. Those with lower socio-economic status (SES) can benefit more in the supportive learning context, since they lack suchlike practices in the off-school context (Langton & Jennings, 1968; Niemi et al., 1998; Ichilov, 2007).

This study is aimed at analysing the relevance of CE courses for the acceptance of democratic values. Specifically, research aims were to analyse (1) the relevance of participatory class climate (PCC) for the acceptance of democratic values among Serbian students who attend the CE courses and (2) the moderating role of students' SES for the relationship between PCC and democratic values acceptance.

Method

Participants and Procedure

The data collected in the CE evaluation study (N = 1073) were used. Participants were final-year students from 20 high schools in Serbia (58% girls). One quarter of students were from grammar high-schools (26%); 66% of students attended 4-year vocational high schools, and 8% were 3-year vocational school students.

The data were collected in 2019, using the pen-and-paper questionnaire that was administered in schools, during CE courses.

Data and measures

The questionnaire used in the evaluation study included a large number of variables and several of them were chosen for the present purposes.

The following measures were included.

Socio-economic status (SES). The combined level of parents' education was used as the measure of students' SES level. Higher values imply higher SES.

Durability of CE attendance. The grade at which students started attending CE courses (the first grade of elementary school (ES) / the fifth grade of ES / the first grade of high school). This measure was included as control. Higher values imply shorter CE attendance.

Participatory class climate (PCC). A composite index ($\alpha = .78$) comprised of several variables measuring how often the teacher encourages the freedom of expression and critical thinking (5 items; e.g. “How often did the teacher promote critical thinking in class?”); how often CE classes include participatory methods (6 items, e.g. “How often did you learn of democracy, citizens’ rights etc. through a debate?”); how often class atmosphere is open and constructive (4 items; e.g. “How often was the class climate cooperative?”). All items were followed by a five-point scale (1. Never – 5. Very often). Higher values on this measure imply more prominent PCC.

Acceptance of democratic values. Students evaluated the importance of 19 values on a five-point scale (1. Not at all important / 5. Very important). The value syndrome consisting of seven values (freedom, justice, equality, social justice, minority rights, protection of the socially disadvantaged, friendly relations between nations) was used as a measure of the acceptance of democratic values ($\alpha = .88$). Higher values imply higher importance of democratic values.

Results

Multiple regression analysis was performed, with students’ SES, durability of attendance of CE, PCC and SES x PCC interaction as predictors, $F(4, 605) = 21.06, p < .001, \text{Adj. } R^2 = .12$ (Table 1).

The results show that the democratic values are more embraced by the students of higher SES and those attending CE classes with a more prominent participatory climate. The acceptance of democratic values was not significantly predicted by the durability of CE attendance.

Table 1: Multiple linear regression predicting the acceptance of democratic values from the set of predictors.

	B	S.E.	β	95% CI for B
Constant	-3.59	.76		[-5.09, -2.09]
Duration of CE attendance	.02	.04	.02	[-.05, .10]
SES	.30	.10	.51**	[.10, .50]
PCC	.98	.20	.82**	[.58, 1.38]
SES X PCC	-.08	.02	-.69**	[-.13, -.02]

** $p < .01$

The relationship between PCC and the importance of democratic values is moderated by SES (Figure 1). The relationship between the acceptance of democratic values and PCC is stronger in students’ with the lowest SES, and the weakest in those with the highest SES. The students with the least privileged social background “benefit” most from class participation in terms of accepting the democratic values.

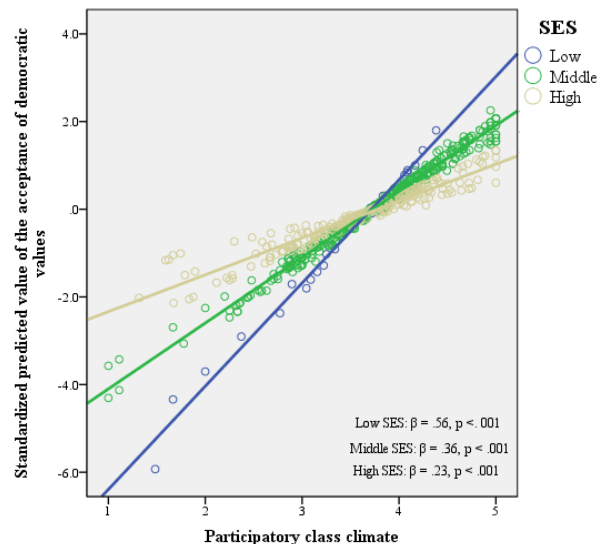


Figure 1: Standardized predicted values of the acceptance of democratic values by participatory class climate and socio-economic status.

Discussion and Conclusion

The results of this study support some previous studies that have shown the relevance of the context of learning and active teaching methods for the acceptance of participatory orientations (e.g. Finkel & Ernst, 2005; Itchilov, 2007; Morduchowicz et al., 1996; Baucal et al., 2019; see also: Džamonja Ignjatović et al., 2019; Pavlović et al., 2020).

We can argue that the application of the very same principle of tolerance, critical thinking and mutual respect that is promoted in the CE curriculum during CE classes has a significant “payoff” in strengthening the acceptance of democratic values. As debated, CE courses in the Serbian context are, in a sense, ‘schools of democracy’. Students learn ‘democracy’ by practicing it during CE classes on a small scale.

Underprivileged students gain most from the CE courses. It could be that CE messages are the most effective in cases when there is no ‘informational redundancy’ (Langton & Jennings, 1968), i.e. when CE lessons are novel experiences for students, not paralleled and/or repeated at home or elsewhere. Additionally, the fact that PCC is relevant for the acceptance of democratic values in general, i.e. ‘independently’ of SES, could mean that school climate can ‘compensate’ for the lack of other off-school resources in that regard.

Limitations and recommendations. The research design was cross-sectional and the conclusion regarding the CE courses’ ‘effects’ on democratic values is only tentative. Besides that, this study included only students that attend CE courses; conclusions based on the comparison between those who do and do not attend CE in terms of the acceptance of democratic values would be more valid. Future analyses would also benefit from more detailed measures of SES.

Acknowledgments

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My Ethnicity is Older than Yours! Delegitimizing other's Ethnic Identity as a Correlate of Inter-ethnic Attitudes

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Abstract

The aim of this study was to operationalize general tendency to deny the existence of some ethnic groups based on the length of their history (Ethnic identity delegitimization, EIDL), and to examine its relation with Ethnic identification, Essentialism, Political orientation, Social dominance orientation (SDO), and attitude towards the outgroup. Thus, we constructed a 14-items EIDL scale. A total of 140 individuals (76% women) participated in the study. Principal component analysis revealed that EIDL is a unidimensional construct, distinct from other measured variables, indicating its construct- and discriminant validity. As expected, EIDL was positively related to ingroup ethnic identification, right-wing political orientation, and social dominance (but negatively to egalitarianism); it was also related to higher essentialist beliefs. Finally, EIDL marginally contributed to prediction of a more negative attitude towards Bosniaks. The results indicate that ethnic identity delegitimization is a distinct construct that is related to outgroup attitudes and that it should be examined more detailed in the context of intergroup relations.

Keywords: Ethnic identity delegitimization, Ethnic identity, Interethnic relations, Outgroup attitudes

Introduction

“Serbs and Bosniaks are the same ethnic group” – headlines like this can often be found in Serbian conservative media. One of the usual arguments for such claims is based on the length of a group's existence, i.e. its *historicity*: *WE exist longer than THEM, therefore THEY are not a real ethnic group*. Such claims that “younger” ethnic groups are less legitimate than the “older” ones, encompass beliefs that their identity is therefore less stable, less real and more fragile. It was exploited in Yugoslav Wars to assimilate Bosniaks with Serbs or Croats (Hayden, 2002), and is still present in ethno-nationalist discourse (Vajzović, 2008). Here we focused on the general tendency to (de)legitimize an ethnic identity. We defined ethnic identity legitimizing as acknowledging that an ethnic group is real, distinct from the other ethnic groups, and that those who identify with the group should be recognized as its members. On the contrary, ethnic identity delegitimizing (EIDL) includes claims that a particular ethnic group does not exist and perceiving those who identify with it as members of some other ethnic group. In conceptualizing it, we draw from the research of other groups whose identity is being denied, such as bisexuals (e.g. Page, 2004).

We identified two constructs that are similar to EIDL for their historicity aspects: Collective self-continuity (CSC) and Autochthony. In the ethnonational context, CSC represents a feeling that one is a part of their nation's shared

history (Smeeke & Verkuyten, 2013). Its main distinction from EIDL is the relational aspect: while CSC is only related to one's ingroup, EIDL always implies questioning of the outgroup ethnic identity. Autochthony represents a belief that territory belongs to a group that inhabited it historically earlier (Martinovic & Verkuyten, 2013). It is distinct from EIDL for focusing on primo-occupancy of a territory as a determinant of group's rights, while EIDL is focused on the length of existence of the two groups.

Typically, CSC and Autochthony are positively related to ingroup (IG) identification, and negatively to outgroup (OG) attitudes. Autochthony endorsement is positively related to political conservatism and Social dominance orientation [SDO] (Verkuyten et al., 2016). Relying on its similarity to CSC and Autochthony, in the present study we examined if EIDL is similarly related to their mentioned correlates. We expected EIDL to be positively related to the IG identification, conservatism, and SDO, and negatively to the OG attitude. We also examined its relation to Psychological essentialism, as it is another strategy of ethnic OG assimilation (Hayden, 2002), thus expecting positive association with EIDL. Finally, we hypothesized that EIDL would predict outgroup attitude over and above the other five variables. To test our hypotheses, we constructed a scale that measures EIDL and tested for its psychometric properties.

Method

Participants and procedure

We recruited 139 participants (75% women), aged 18-62 ($M = 28.1$, $SD = 8.4$), who identified themselves as ethnic Serbs. The survey was administered via SoSci survey platform (Leiner, 2019).

Measures

Unless indicated otherwise, the items were measured on a 7-point Likert scale (1 = fully disagree; 7 = fully agree).

Ethnic identity delegitimization (EIDL) scale consists of 14 items that capture a general tendency to delegitimize other ethnic identities. Half of the items are reversely coded. The scale showed high reliability ($\alpha = .92$). The original scale is available in the Repository of the psychological instruments in Serbian (Lazić et al., 2020), while translated items are listed in Appendix (Table A1).

We registered Essentialism using Belief in social determinism scale (Rangel & Keller, 2011), with the items modified to capture the tendency to essentialize ethnic identity ($\alpha = .89$). Participants' Ingroup ethnic identification

was measured using three items from Phinney's (1992) Multigroup Ethnic Identity Measure ($\alpha = .87$). Political orientation was registered using a bipolar 11-point item (-5 = far left; 5 = far right). We measured SDO using a 14-items version of Social Dominance Orientation scale (Pratto et al., 1994) that captures two dimensions: dominance ($\alpha = .77$) and egalitarianism ($\alpha = .90$).

Attitude towards Bosniaks was measured on the Feeling thermometer (Converse & Presser, 1986). Using a 100-point slider, participants indicated their feelings towards Bosniaks (outgroup) and Serbs (ingroup). We calculated the attitude score by subtracting IG feelings from OG feelings, so that higher scores indicated more positive OG attitude.

Results

To examine dimensionality of EIDL scale, we ran principal component analysis (PCA; Although confirmatory factor

analysis (CFA) would have been more appropriate, the sample was not large enough to obtain reliable CFA results). Parallel analysis indicated a clear unidimensional solution ($\lambda = 7.22$). The loadings are detailed in Appendix A. We performed further analyses on the mean score.

As expected, EIDL was positively related to Essentialism, IG ethnic identification, Right-wing political orientation, Social Dominance, and Outgroup attitude (Table 1). The relation with SDO subscale Egalitarianism was negative.

To test for discriminant validity of the EIDL scale, we ran the PCA with Promax rotation on the items representing EIDL, Essentialism, Ingroup identification, and SDO. Out of four extracted factors, the first had significant loadings only on 14 items of EIDL scale, indicating that EIDL is distinct from the other measured constructs (see Table A2 in Appendix for details).

Table 1: Means, Standard deviations, and correlations of the measured constructs

	M	SD	2	3	4	5	6	7
1. EIDL	3.2	1.3	.51**	.44**	.50**	.37**	-.40**	-.40**
2. Essentialism	3.1	1.1		.38**	.50**	.39**	-.40**	-.35**
3. IG Identification	4.6	1.7			.49**	.07	-.25*	-.44**
4. Political Orientation	-1.5	2.8				.47**	-.45**	-.43**
5. SDO-Dominance	3.2	1.2					-.58**	-.15
6. SDO-Egalitarianism	5.8	1.2						.27*
7. OG attitude	-20.7	34.1						—

** $p < .001$; * $p < .01$

We tested predictive power of EIDL using hierarchical linear regression with attitude towards Bosniaks as an outcome variable. In the first step, we entered Essentialism, IG identification, Political orientation, and SDO subscales as predictors. In the second step, we added EIDL as a predictor. In the first model, IG Ethnic identification and political orientation significantly predicted OG attitude ($R^2_{adj} = .24$, $F(5,133) = 9.89$, $p < .001$; see Table 2). Adding EIDL to the model marginally improved prediction ($R^2_{change} = .02$, $F_{change}(1,132) = 2.98$, $p = .087$), implying its limited contribution to explaining the variance of OG attitudes after controlling for the other relevant variables.

Table 2: Prediction of attitude towards Bosniaks

	Model 1		Model 2	
	β	p	β	p
Essentialism	-0.13	.145	-0.09	.330
Ethnic IG Identification	-0.26	.005	-0.22	.019
Political Orientation	-0.23	.024	-0.21	.04
SDO Dominance	0.09	.905	0.11	.266
SDO Egalitarianism	0.10	.301	0.09	.375
EIDL	—	—	-0.16	.087
R^2 (R^2_{adj})	.27 (.24)		.29 (.26)	
R^2_{change}	—		.02	

Discussion and conclusion

Our results suggest that Ethnic identity delegitimization tendency can be reliably measured and that it is distinct from other socially related individual differences constructs. It showed the pattern of correlations to the ideological variables, IG identification, and SDO that we expected relying on previous studies of Collective self-continuity and Autochthony. The relation between EIDL and OG attitude is in line with our hypothesis, while its unique predictive

power over and above those related constructs is unstable. Stability of the obtained results should be further confirmed in larger and more diverse samples of participants.

Future studies should explore the relation between EIDL and other relevant constructs in a single design, primarily Collective self-continuity and Autochthony due to their shared aspect of historicity. Furthermore, its relation to OG attitude should be more explored, since Bosniak identity is questioned in everyday discourse more frequently than other ethnic identities. Thus, it is essential to examine how EIDL is related to attitude towards ethnic OGs whose identity is not normally delegitimized; also, the EIDL-attitude relation should be examined outside post-conflict context as well. Finally, experimental manipulations of OG historicity perception would disentangle its causal relation with attitude and potential mediating role of EIDL.

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Appendix A

Table A1: PCA details for EIDL scale

Item	Loading
1. To be considered an ethnicity, a group should have long history and tradition.	.848
2. It is normal for groups that share some characteristics to consider themselves a nation or ethnicity.*	-.743
3. Ethnic groups that are historically older have a right to deny the existence of younger ethnicities.	.744
4. An ethnic group whose culture is not long enough cannot be considered an ethnicity.	.854
5. The length of the existence of particular ethnic group determines its social status.	.604
6. Regardless of the length of its history, no one has right to deny the existence of any ethnic group.*	-.747
7. A group cannot consider itself an ethnicity if it is not at least a few hundred years old.	.830
8. We do not have a right to deny existence of any ethnic group, even if it is much younger than ours.*	-.753
9. It is normal that sometimes some ethnic groups disappear and some new appear.*	-.502
10. Common culture determines an ethnic group much more than the length of its existence.*	-.672
11. If people feel as members of an ethnic group, no one has rights to deny that.*	-.711
12. To find out a person's ethnicity, it is enough to ask them how they identify.*	-.550
13. Ethnic identity is determined by birth and is immutable.	.524
14. If a group does not have a long history, it cannot consider itself an ethnic group.	.847

Note. The items labelled with “*” are reversely coded.

Note. KMO = .913; Bartlett's χ^2 (91) = 1158.4, $p < .001$; 51.7% of the variance explained.

Table A2: Discriminant validity of EIDL

	Component			
	1	2	3	4
EIDL 1	0.869	0.020	-0.019	0.026
EIDL 2	-0.720	0.032	-0.032	-0.106
EIDL 3	0.683	-0.141	-0.019	-0.012
EIDL 4	0.901	0.085	-0.031	-0.069
EIDL 5	0.558	0.006	0.056	-0.107
EIDL 6	-0.873	-0.142	0.071	-0.136
EIDL 7	0.865	0.129	0.043	-0.040
EIDL 8	-0.712	0.119	0.033	-0.008
EIDL 9	-0.578	-0.057	0.126	0.082
EIDL 10	-0.671	0.007	0.048	0.121
EIDL 11	-0.605	0.321	0.104	0.051
EIDL 12	-0.519	0.066	-0.008	-0.043
EIDL 13	0.423	0.128	0.261	-0.165
EIDL 14	0.871	0.110	0.014	-0.096
Essentialism 1	-0.098	-0.007	0.803	0.046
Essentialism 2	0.020	-0.188	0.636	0.032
Essentialism 3	0.266	0.243	0.638	-0.223
Essentialism 4	0.128	0.144	0.739	0.115
Essentialism 5	0.074	0.052	-0.639	0.216
Essentialism 6	-0.115	-0.062	0.792	0.052
Essentialism 7	-0.032	0.092	0.692	0.119
Essentialism 8	-0.097	-0.017	0.805	-0.123
Essentialism 9	0.000	0.156	0.380	-0.052
Essentialism 10	-0.135	0.005	-0.562	0.025
Essentialism 11	-0.028	-0.028	0.797	0.018
Essentialism 12	-0.008	-0.104	0.569	-0.185
IG identification 1	0.165	-0.195	0.076	-0.661
IG identification 2	0.132	-0.349	0.132	-0.707
IG identification 3	0.157	-0.112	0.113	-0.708
SDO 1	-0.099	-0.504	0.239	0.317
SDO 2	0.148	-0.485	-0.296	0.191
SDO 3	0.193	-0.297	0.055	0.224
SDO 4	0.205	-0.255	0.129	0.555
SDO 5	0.025	0.008	0.436	0.294
SDO 6	0.211	-0.164	0.176	0.581
SDO 7	-0.025	0.795	-0.061	0.082
SDO 8	0.099	0.882	0.012	0.071
SDO 9	0.193	0.779	-0.050	0.229
SDO 10	-0.024	0.863	0.072	0.062
SDO 11	0.063	0.830	-0.006	0.035
SDO 12	0.037	0.872	0.094	0.049
SDO 13	-0.064	-0.587	0.310	0.009
SDO 14	0.026	0.766	0.057	0.120

Note. Significant loadings (> .30) are bolded.

Note. Promax rotation was used.

Note. KMO = .864, Bartlett's χ^2 (903) = 3885.21, $p < .001$. The factors explain 52.92% of the variance.

INVITED LECTURES

A proposal to consider a new model of the self and the methodology of its exploring and transforming

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Abstract

The aim of this work is to present a new concept of the agonistic self as well as a new methodology for its exploring and transforming. Based on Foucault's analytics of power, but also constructivist metaphor of the community of self and the theory of polyphony we propose the self to be conceived as multiple and emerging from the dialogical encounter of the various positions of subjectivities unequalled in power. This theoretical model of the self explains the empirical findings suggesting that the sense of self is fragmented, contextualized, changeable and inconsistent. Further, inspired by the technique of the constructivist rologram, we developed a new approach to exploring and facilitating change in the agonistic self. The case study research on student's sense of self is conducted and the results were presented as the illustration of the methodology of the agonistic self.

Keywords: the multiple self, qualitative research, identity, power.

The agonistic self

In this work I would like to consider a new concept of the agonistic self, the methodology for its exploring and transforming, and a case study as an illustration of the implementation of the proposed methodological approach. The model of the self and the proposed methodology are inspired by Foucault's (1978) analytics of power, Bakhtin's (1929/1984) polyphony, Mair's (1977) community of self and the dialogical self theory (Hermans & Kempen, 1993).

The agonistic self might be conceived as a strategic situation of the encounter of multitude of the subjectivities struggling for prevalence. The self is a name for the temporary and dynamic relations of power between different positions of subjectivities which are voiced in individual consciousness. The main characteristic of its dynamics is that it rests on power relations. There is always a tension between domination and instances of resistance, which creates the possibility of a reversal and usurpation of power. The agonistic self is a complex multiple event, extended in time, social and personal, rather than an object. The subjectivities refer to the institutionalized power and its practices of subjectivization which create a field of numerous vacant places (Foucault, 1972). These are discursive positions of giving accounts, thought and action which may temporarily occupy individual bodies. That the self is temporary strategic situation means it refers to the momentary and changeable order of power on the 'stage' of the confronting perspectives, which provides some of them with the legitimacy to impose their arguments in the polyphonic sense of self. Finally, the positions of

subjectivities appear in the individual consciousness as voices that carry messages and enter into mutual dialogues.

The agonistic self methodology

The agonistic self interview

In order to explore the agonistic model of the self as well as to facilitate changes in its dynamics we developed a methodological approach consisting of the agonistic self interview and a set of interpretive categories for the analysis of the materials from the interviews. The agonistic self interview is inspired by the constructivist rologram (Stojnov & Pavlović, 2009; Stojnov & Procter, 2012). The procedure for its conducting involves the following steps: 1) the participants are encouraged to recognize in themselves different ways of thinking about or experiencing a researched phenomenon (for example, professional identity) and to perceive those various viewpoints as metaphoric voices, which could be in different mutual relationships; 2) this is followed by the elicitation of voices and their graphic presentation, whereby the participants name the voices and write down short narratives which reflected the ideologies of each one; 3) the participants are encouraged to "recognize" in some of their thoughts and messages the voices of significant others, such as those of their parents, colleagues and peers, and to complement their repertoire of subjectivities with them; 4) the participants describe the relationships between the elicited voices taking into consideration the dimensions of domination versus marginalization and cooperation versus conflict (the examples of the questions in this step: Which voice is particularly influential or the loudest?, Which voices oppose him/her most and how?, Can you describe the typical situation in which this voice regains or maintains his/her dominant position?, Which voices cooperate most? And which of them enter the conflict?).

The procedure of analysis

Multiple-case and cross-case study designs (Yin, 1994/2014) are combined. For the data analysis within the case study a combined deductive-inductive approach to thematic analysis (Braun & Clarke, 2006) is used. We first started from the theoretical categories of domination, resistance, conflict and cooperation, to end with a series of inductive categories. Nevertheless, we have used interpretive concepts from the analytics of power (Dreyfus & Rabinow, 1982; Džinović, 2010; Foucault, 1978), discursive psychology (Davies & Harré, 1990), Bakhtin's (1929/1984) polyphony and the psychology of personal

constructs (Kelly, 1955) to name some inductive categories. The multi-iterated negotiations about the meanings of the categories were conducted as we implemented the standard of intersubjective agreement. The list of categories is given in the table of categorization below:

Table 1: Thematic analysis framework

Content	Labels and descriptions of the voices
	<ul style="list-style-type: none"> • Ideologue • Facilitator • Illegitimate facilitator
	<ul style="list-style-type: none"> • Executor • Process modifier • Subsequent evaluator
	<ul style="list-style-type: none"> • Domination • Prevailment • Resistance
	<ul style="list-style-type: none"> • Legitimation • Delegitimation • Role relationship • Referring to core argumentation • Genre change • Dissociation
Form	<ul style="list-style-type: none"> • Conflict • Productive tension • Team work • Cooperation • Acceptance with critique • Ventriloquism
	<ul style="list-style-type: none"> • Team • Intervention team • Collaborators • Productive tension • Subsequent elaboration • Clash of ideologies • From cooperation or productive tension into conflict
	<ul style="list-style-type: none"> • Constellations

The following case study of the third grade secondary school female student demonstrates the agonistic self as an explanatory model and the application of the new methodology. An extended report about the case study see in the analysis of the multiple self and dominance (Džinović, 2020). Her repertoire of voices consists of The Real Me, The Lazy Me, and The Angry Me as internal voices as well as The Voice of the Peers, The Parents' Voice, The Grandparents' Voice, and The Neighbors' Voice as external ones.

The most common constellation of the voices is a team which consists of The Parents' Voice and The Grandparents' Voice as dominant ideologues and The Real Me as the executor of their ideological positions. The Real Me is identifying with the narrative about the importance of education for success in life which belongs to the dominant ideologues. They provide the legitimation for The Real Me: *...who tell me that I shouldn't give up and that wakes me up and I start and keep going to the end.* On the basis of that legitimation The Real Me undertakes a series of maneuvers and tactics towards other voices in order to realize the dominant ideology of the worthiness of education.

One of the key ways to execute the dominant ideology is to struggle with the two antagonists personified in The Voice of the Peers and The Angry Me. The Real Me recognizes a threat to its position in The Voice of the Peers' message: *We don't have to study.* The Real Me struggles to maintain the prevailment over it by the following argument: *... I should finish school, and afterwards I should go further. You're really good friends to me, but you don't have much influence on me not to study... because that pays off in the end.*

The other key opponent is The Angry Me and when it prevails over The Real Me: *...she gives up and then she doesn't study, sometimes I really can't study for ten days.* However, in most cases The Real Me succeeds in the prevailing over The Angry Me by the tactics of delegitimizing it as unacceptable and of referring to core argumentation: *...because I want to have excellent grades... with some desire and persistence I defeat that Angry Me.* The Angry Me is also striving to resist the narrative of The Parents' Voice about the importance of studying: *I don't like to study, I don't want to study after all, I don't want to finish [this school].* In such a strategic situation The Real Me again establishes prevailment over The Angry Me with the arguments: *I know that I can't, they are my parents and then, of course, I have to do what they say, I have to study and thus defends the dominant position of The Parents' Voice as well.*

The case study: "I like to study. That is, probably, strange now for you"

Conclusions

The presented case study shows how the sense of self might be conceived as the ongoing and temporary outcome of the clash between positions of subjectivities. The model of strategic situation including the tensions between the positions of dominance and resistance may be useful in explanation of how people construe their identities out of the everyday polyphony of social world. Also, the new developed methodology may help in further understanding of stability/change, coherence/incoherence and self-regulation in the dynamics of personality.

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“We must do what the leader says” – Children’s understanding of the rules of cooperation

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Abstract

How do ten-year-olds conceive cooperation? What meanings do they assign to the rules of cooperation? Do children interpret the rules of cooperation the same way as adults? Why do ten-year-olds consider it natural for every group to have a leader? This paper offers possible answers to these questions based on the analysis of spontaneous dialogue between children on the topics of cooperation and the rules of cooperation.

Keywords: cooperation; ground rules, ten-year-olds; conversational analyses

Introduction

Productive cooperation is one of the highly valued social skills in today’s world. Therefore, it is not surprising that research has greatly focused on the topic of cooperation and its realization across different contexts and ages. In this study, efficient cooperation was defined as continuous joint dedication of two or more peers to achieving a common goal, solving a problem together or construing new knowledge (Mercer & Littleton, 2007). An ample body of empirical evidence has shown that social interactions between peers are not necessarily efficient, do not always lead to development, and do not inevitably constitute cooperation (e.g. Galton & Williamson, 1992; Mercer & Littleton, 2007). In light of these findings, numerous projects have focused on the adequate acquisition of these skills (Mercer, Dawes, Wegerif, & Sams, 2004; Mercer, Wegerif & Dawes, 1999; Rojas-Drummond & Mercer, 2003; Wegerif, Littleton, Dawes, Mercer, & Rowe, 2004). One of the key elements of trainings aimed at encouraging cooperation is the existence and establishment of the ground rules of cooperation (Dawes, Fisher, & Mercer, 1992).

For the abovementioned reasons, Mercer emphasizes the importance of introducing ground rules before every activity in which children engage together (Mercer, 1996). These rules are necessary in order to maintain the kind of working environment in the classroom that is necessary for productive learning (Dawes, Fisher, & Mercer, 1992). Mercer and colleagues defined seven ground rules of cooperation (Mercer, Wegerif, & Dawes, 1999): (1) group members should exchange all information among themselves; (2) group members should always strive to achieve mutual agreement; (3) all group members share responsibility for decisions they reach; (4) group members are expected to anatomize the task at hand; (5) accepting challenges, that

is, acknowledging the existence of disagreements between group members and the need to discuss such disagreements; (6) deliberating on all suggestions put forward during conversation; (7) encouraging all group members to speak. The basic function of the first three rules is to integrate group members so they could construe knowledge together, through dialogue. The fourth rule emphasizes the need to analyze all group tasks, since it is common for group members to lack interest and fail to participate in problem-solving. The fifth rule pertains to accepting challenges and it is particularly important as it points to the fact that challenges in productive cooperation motivate interthinking and initiate knowledge construction. The penultimate rule requires group members to consider all the proposed alternatives before making the final decision. The last rule encourages all members to sound their thoughts in front of the group.

Available data on peer cooperation in Serbia reveal that in practice, teachers most frequently use group work as a teaching method that fosters spontaneous social interaction. Such interaction results in parallel individual work among students or dialogue marked by conflict (Antić, 2010). Empirical studies have shown that even this form of spontaneous group work is rare in practice: methods that commonly involve cooperation between students are employed in only 1% to 5% of all classes (Radulović & Mitrović, 2014). Moreover, teachers tend to believe that school is a place where students should develop their cognitive competencies (Džinović, Đević, & Đerić, 2013). In class, a fair number of teachers ask questions that require unidirectional correct answers. Thus, they fail to provide room for students to think, discuss, and actively participate in the dialogic learning process (Radišić, 2013). Furthermore, recent Serbia-based studies examining social interaction between children and its role in cognitive development have revealed that children’s conversations more often feature conflict and cumulative dialogue in comparison to exploratory dialogue (Jovanović & Baucal, 2007; Jošić, Buđevac, & Baucal, 2012; Jošić, 2017; Stepanović & Baucal, 2018).

Research findings indicate that students are not provided with opportunities to explicitly learn what constitutes cooperation and to practice cooperation in class. Empirical data suggests that even when children go through explicit cooperation training, such training does not yield results (Jošić, 2017). It is reasonable to question whether students even recognize the value of collaboration in such contexts. In other words, the question is whether exchanging ideas and argumentation

are meaningful from the student perspective. This research aimed to examine the meanings of the ground rules defined by Mercer.

Method

Sample

The sample included 20 ten-year-old fourth-graders. The children were paired up with the goal of solving tasks together, through dialogue. There was no asymmetry in acquaintance length and gender distribution across pairs (Psaltis & Duveen, 2006). A total of 10 pairs of children participated in the research, with parents' written consent.

Instruments

The research used one of the tasks from the Thinking Together project (Talk for learning atKS2 – Traffic light activity: Dawes, 2008). The task was aimed at establishing the ground rules of cooperation that lead to the adequate use of language in problem-solving. The instrument comprised 16 sentences whose function was to establish the ground rules of collaboration (Mercer, 1996). The task was translated into Serbian, adapted to suit pair-work, and adjusted for male and female dyads (Jošić, 2017). The task requires the child/children to identify good and bad rules of cooperation. Children should use the green pen to underline good ideas, while bad ideas should be underlined in red. Table 1 shows the sentences, their functions in the context of establishing the rules of cooperation (in brackets), and the frame of formulation (the plus sign stands for a positive formulation and the minus sign indicates a negative formulation).

Procedure

In the first part of the conversation between the pairs and the interviewer, the children were familiarized with the topic of cooperation as a topic relevant to their lives. In the second part of the conversation, the children had the opportunity to agree on the rules of good cooperation by solving the Traffic Light Activity task. The children read each sentence and identified the good/bad rules of cooperation. The condition was to reach the decision together. More specifically, it was important for both members of the dyad to agree on the common understanding of the sentence read. After this segment, the interviewer analyzed each sentence with the children in order to obtain explanations and comments or to resolve any dilemmas that might have arisen during pair-work. Audio and video recordings of all interactions were made for the purpose of subsequent transcription and analysis.

Data analyses

Sentences that represent certain rules of cooperation were isolated as units of analysis. Descriptive statistics

were performed, calculating the number of correct/incorrect answers to each sentence/rule. Correct answers were the ones in which the pair used the right color to underline the sentence and offered the interviewer an explanation that supported the pair's decision to identify the stated idea as a good or bad rule of cooperation. All interactions were transcribed in accordance with the rules proposed by Jefferson (Jefferson, 2004), which are most commonly used in conversation analysis. A total of 160 dialogue sequences were obtained for analysis. This paper only includes sequences related to the sentence that received a disproportionate number of incorrect answers.

Results

The descriptive data presented in Table 1 reveal that the children had a good understanding of the ground rules of cooperation. In other words, the children adequately underlined a large number of sentences and clearly identified these ideas as helpful or detrimental to further collaboration. Among sentences that received incorrect answers, the third sentence (“We must do what the leader says”) stood out, with as many as half of the pairs responding incorrectly, that is, identifying it as a good rule that could help them cooperate successfully.

A qualitative analysis was conducted with the aim of examining the understanding of the third sentence: *we must do what the leader says*. The conversation analysis provided a better understanding of the dynamics of the dialogue and context within which the task/item was solved. For the purpose of the qualitative analysis, we isolated 5 dialogue sequences involving pairs that gave incorrect answers when solving the task. This sentence is a part of Mercer's third rule of cooperation, which states that all participants in the interaction share responsibility for the decision reached. The sentence was negatively formulated and stated that one person is responsible for the decision reached and this person is the one identified as the leader. In other dialogue sequences, reasons why children recognized this sentence as a good idea notably included: previous cooperation experience (sequence 1), the context within which the rule was evaluated, and refusing to accept the possibility of everyone being equal, that is, the possibility of the absence of a leader.

Table 1: Sentences that encouraged the establishment of the ground rules of cooperation

Sentence (function)	Frame	No. of incorrect answers
1. We will take turns to talk and to listen. (elaboration)	+	2
2. We will try to reach shared agreement. (establishing the common concept)	+	0
3. We must do what the leader says. (sharing responsibility)	-	5
4. No-one can change their mind. (deliberation)	-	2
5. Everyone will talk as loud as they can. (maintaining order)	-	1
6. We will try to get along with each other. (integrating dyad members)	+	0
7. We will listen and think about each other's ideas. (deliberation)	+	0
8. When a friend suggests a solution to a problem we will ask for reasons. (challenging)	+	0
9. We think it's best to share our thoughts. (integrating dyad members)	+	0
10. The person who is writing chooses the final decision. (establishing order)	-	1
11. If one of us finds it hard to join in, we can ignore that. (integrating dyad members)	-	0
12. We will keep our ideas quiet so that no-one else can copy. (maintaining order)	-	2
13. The person who speaks first will decide what to do. (sharing responsibility)	-	1
14. We understand that talking is thinking aloud together. (establishing the common concept and deliberation)	+	0
15. We will try to beat each other. (conflict prevention)	-	1
16. We will make group decisions that all can agree to. (establishing the common concept)	+	2

Sequence 1.⁹

1. Mila: we need to do what the leader says ((reading))
2. Maša: yes =
3. Mila: = yes
4. ((2.0 looking at each other))
5. Mila: well yeah (.) that's right
6. Maša: yes (quietly)
7. Mila: well yeah (.)you know that the teacher chooses a leader when we work in groups
8. Maša: yeah yeah
9. Mila: and the leader is in charge
10. Maša: the answer here is yes ((points to the sentence while looking at Mila))
11. Mila: yes (.) underline it in green

Final discussion

The results of this research indicate that at first glance, children's understanding of the rules of cooperation does not significantly differ from adults' understanding of the rules. Children can correctly identify and recognize listening, consultation, exchanging ideas and information, seeking argumentation for the proposed solutions, and motivating collocutors as ideas that contribute to efficient cooperation. However, the rule that emerged as the most challenging for the children in this research was the one underlying the sentence: „we must do as the leader says". This negatively formulated rule of cooperation speaks about group members sharing responsibility. This was the question that received the largest number of incorrect answers, with children thinking that it is a good idea to have a group leader and exclusively listen to the leader's suggestions. Some of the reasons why children incorrectly underlined this sentence indicate that we need to consider the meanings attached to peer collaboration. The analysis of these interactions highlighted the important role of previous cooperation experience, the influence of the teacher as the person who sets the rules of cooperation, and the context within which cooperation takes place. Depending on the context, some rules may not be valid or may require modification.

This finding has particularly important implications for the educational context in which teachers often disregard the meanings that children attach to certain group activities, along with the fact that students have different ideas about how problems should be solved in teamwork. Although sometimes it may appear like students are solving a task together or students may state that they how to cooperate, the question is how they

⁹ The names of all children who participated in the research have been replaced with other names for identity protection purposes.

conceive cooperation and which implicit peer rules they follow in such situations. Research on the effects of learning the rules of efficient cooperation has shown that these rules should be included in the systematic education of children.

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Storm and Wellbeing of The Adolescence In Serbia

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Abstract

Adolescence has been considered as a period of psychological stress and storm from the time when it was established as a distinguished life period. Usually, three domains of the crises were discussed: relationship with parents, mood disruptions and the manifestation of the risk behaviour. Positive psychology influenced studies of adolescence and put the wellbeing of adolescent in the focus. The aim of this paper is to discuss justifications of the storm-stress model analyzing current theoretical trends and empirical findings of the specificity of today's youth and analyse available studies about adolescents' wellbeing.

Keywords: adolescence; wellbeing; risky behaviour; Serbia

Introduction

Adolescence is established as a separate life period at the beginning of the 20th century. From the early works, adolescents have been marked as difficult, rebellious, going through the storm and stress (Lightfoot, 1997).

The same view is present in contemporary research. An assumption is that adolescents are more prone to risk-taking behaviour because of the insufficiency of their decision-making process. Although they are more successful thinkers than ever before, for some reason they made a poor decision that leads them to risk-taking behaviour when they should avoid that. Researchers have a different explanation why that is the case. Steinberg pointed out that hot way thinking (fast, emotional driven) is triggered more often between adolescents, especially in the presence of peers (Steinberg, 2005). Contrarily to that, Rivers, Reyna & Mills (2008) claims that adolescents are too analytical thinkers meaning that they will take a risk when the odds of unpleasant events are too small (for example, jumping from a parachute is not dangerous because most people don't hurt). Through adulthood, we learn that some risks should always be avoided no matter what mathematical calculation says.

This is consistent with the notion of sensation seeking—the willingness to take risks to attain new, varied, and stimulating experiences—an important mediator for risky behaviour. This willingness increases between age 10 and 15 years, suggesting that it is affected by puberty (Hansen, & Breivik, 2001).

The hypothesis is that decision- making difficulties and sensation-seeking tendency are consequences of immaturity in brain development. Research has specifically highlighted the lack of synchronicity between the rapid growth of the limbic system (the reward system), and the slower maturation of the pre-frontal cortex (the regulatory system) (Geidd, 2015).

Taking all that into consideration, adolescents are more prone to risky behaviour, a storm is present in the

relationship with parents, they are prone to risky behaviour or depression because their biology determines that.

Wellbeing of the I-gen generation

Have we got an agreement? Could we say: “Today's teenagers are no different than any other generations? They are all prone to risk-taking behaviour”, and rest our case. Unfortunately, as always in science, there are few buts. One “but” came from the well-known Twenge's (2017) study of the generational differences. Her research has shown that today I-gen adolescents (generation that prefers texting to talking on the phone) is less rebellious. This means that they have been less involved in: fighting with parents, going out with peers, drinking. Except less rebellious, they are, as Twenge put it, “growing up more slowly”: less experience with part-time work, haven't got a driving license, more dependency from parents. Also, loneliness and insecurity are their weak points.

Second “but” came from a group of authors interested in discovering the power behind the use of certain meanings. They assume that adolescents are not more dangerous for society than adults. That statement is just a stereotype. Most of the society distinguishes adulthood as a period of responsibility and adolescence as a time of irrationality (Males, 1997). This division has clear implications. It allows us to exclude adolescents from the important decision-making processes in society because they are not mature enough. In that way, we unfairly restrict youth opportunity, employment, and freedom. These authors claimed that assumptions about adolescents prone to risk behaviour are usually not based on the facts. For example, teen and adult drunk driving death rates follow parallel patterns but we consider adolescents to be more dangerous drivers.

This perspective could look unusual. But, one thing is certain. Studies that compare frequencies of risk behaviour between adolescents and adults are rare. The results show that the curve of risky behaviour frequencies reaches a maximum at the life period that comes after adolescence. It means that all those storms are moved to adulthood. Arnett claims that emerging adulthood should be acknowledged as a distinct period in the life span (for example, Arnett, 2007). During this period young people go through identity exploration, they are instable, self-focus, and feeling in-between. Today's youth are described by early biological maturity and later psychological maturation. According to Arnett, Europe is the region where emerging adulthood is the longest and most leisurely (Arnett, 2006).

Finally, discussion about adolescence has been influenced by current trends in psychology. For nearly one decade, the

Positive Psychology movement has focused on the strengths that allow individuals and communities to flourish (Toner et al., 2012). All around the globe, the well-being of children and adolescence has become one of major interest (Gutman et al., 2010). Research indicates that self-reporting wellbeing has weak stability between childhood and adolescents and the tendency of decrease has been present (Gutman et al., 2010; Patalay, & Fitzsimons, 2018). This perspective changes the way we investigate topics related to education. For a long time, students' achievements are not a major and only concern. School should be one of the sources of wellbeing. Learning should be organized as an activity described by high concentration, engagement and enjoyment (Shernoff et al., 2014).

Storm and stress of the adolescents from Serbia

During the last twelve years a team of psychologist from Institute of the psychology have conducted a lot of studies investigating characteristics of adolescents' leisure time and their relationships with significant others. The aims of this manuscript are to summarize and discuss available data about risk-taking behaviours, adolescent's wellbeing and attitude toward school and parents. Direction for further research will be also provided.

Risk-taking behaviour

The study involved 1358 secondary school students from nine cities in Serbia shows that binge drinking is the most frequent risk-taking behaviour and that around 30% of the students were drunk on at least one occasion in the last 6 months. Epidemiological study confirmed similar results: one in five students from the 1st grade of upper secondary school has been drunk at least once (Institut za javno zdravlje Srbije, 2018). Also, the same analysis reveals that adolescents have more experience with drinking than with smoking. Significant gender difference has been always detected in the research about binge drinking. Girls have been less involved in this behaviour than boys.

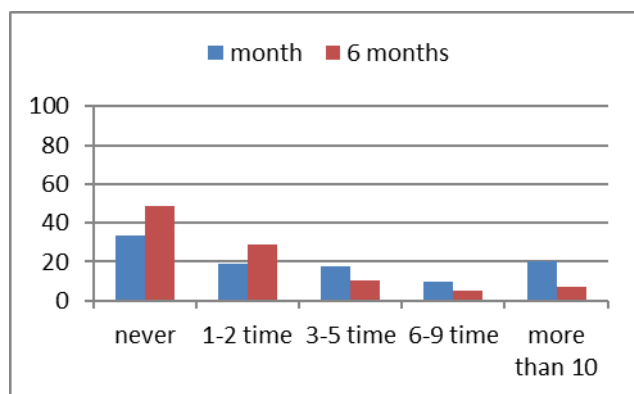


Figure 1: Frequency of the binge drinking during the one month and six month period.

These results indicate that involvement in risky behaviour is not something that characterizes the majority of adolescents.

Most of them are not involved in it. Further research should include emerging adulthood or longitudinal study to investigate when involvement in these types of behaviour reaches the maximum.

Binge drinking is the most prominent risk behaviour in Serbia. Because of that, it will be useful to discover the meaning of this behaviour and the process of accepting it in the peer groups. A smaller qualitative study goes in that direction and indicates that binge drinking is a tool to show to peers that you know how to enjoy and have fun at a party (Videnović, 2015). Also, it is connected with drawing peers' attention to oneself.

Wellbeing during adolescence in Serbia

Kern et al. developed a scale for measuring wellbeing during adolescence (Kern, Benson, Steinberg, & Steinberg, 2016). They based this instrument on Seligman's theory of wellbeing and made it developmentally appropriate for adolescents. Their model consists of five different positive characteristics: engagement, perseverance, optimism, connectedness, and happiness. The assumption is that those dimensions made possible full flourishing in adulthood. When we used this scale, we discovered that scores for five dimensions are high even for adolescents in foster care (Žegarac & Krnjaić, 2019). Also, secondary analyses of the PISA 2018 studies revealed that 15' years-old from Serbia are more satisfied with their life than students from the OECD countries (Videnović & Čaprić, 2020).

The adolescents from Serbia have been living in more unstable circumstances than adolescents in the rest of Europe (Stepanović, Videnović, Petrović, 2019). Because of that, we were worried about their wellbeing. But, data suggest that adolescents in Serbia are happier than we would expect. It would be interesting to pay more attention to these results. Are they very happy and satisfied or admitting negative feelings is implicitly forbidden?

School and parents

Research about leisure time from 2008 and 2018 has indicated that most adolescents are satisfied with the relationship with their parents. More than 80% of them are satisfied or very satisfied. We didn't find rebellious adolescence. So, maybe Also, we didn't investigate if dependency from the parents became a characteristic of growing up in Serbia.

Research about the free time of the upper secondary school students indicates that the students from Serbia spent the same amount of time doing homework as students from Europe (Pešić, Videnović, Plut, 2021). But their achievements are not so high. PISA studies have shown cycle after cycle that the scores of the students from Serbia are below the OECD average (Videnović & Čaprić, 2020). Every third student does not reach the basic literacy level. They are at risk and will have difficulty coping with the challenges of the modern world. Also, qualitative data analyses revealed that upper secondary school students

found completing school's task mentally demanding and, at the same time, boring (Pešić & Videnović, 2017). Truancy is a big issue in the Serbian education system. Most students in Serbia were late to school at least one in two weeks, while 41% were absent from some classes. The percentage of students who are late or absent from classes is much lower in OECD countries. Also, students from Serbia value school less than students from OECD countries. Every fourth student in Serbia does not think it is important to work hard at school. To summarize these findings: a lot of effort for not so great achievements. Further research could also include parents' perspective: Do they value learning or do they pay all their attention only to grades? Schoolwork maybe has a status of social games and the students have tasks on how to win the game with as little effort as possible.

Discussion

Some current research has questioned the existence of adolescents' rebelliousness. Most adolescents do not go to the phase of storm and stress. This also applies to adolescents who grow up in Serbia. Most of them haven't got any problems with their parents and they are not involved in risk-taking behaviour. Then, why our perception of that period is different? It seems that the inaccurate meaning of adolescence could be a valuable research theme. The role of the media in producing negative images about this period should be discussed. Also, results indicated that adolescents' from Serbia report a relatively high level of well-being and life satisfaction. An important topic is if expressing the feeling of depression and sadness is maybe implicitly forbidden in our society full of beautiful pictures and positive status in social media.

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