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## KNJIGA SAŽETAKA BOOK OF ABSTRACTS



be experienced with three modalities. This time, the inhibitory effect of NoM was marginal:  $\beta=23.8$ ,  $t(93.96)=1.9$ ,  $p=0.06$ .

We demonstrated the relevance of the perceptual information in the word processing. In the E1 the diversity of perceptual experience affected processing over and above the intensity of the same experience. However, the control of auditory modality reduced and almost cancelled out the NoM effect. To the best of our knowledge, this is the first explicit demonstration of processing inhibition by the auditory component.

**Keywords:** embodiment theories, perceptual richness, auditory modality, lexical decision task

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Ksenija Mišić<sup>a</sup>, Dušica Filipović Đurđević<sup>b</sup>

<sup>a</sup>Laboratory for Experimental Psychology, Faculty of Philosophy, University of Belgrade

<sup>b</sup>Department of Psychology, Faculty of Philosophy, University of Belgrade

Email: [ksenija.misic@gmail.com](mailto:ksenija.misic@gmail.com)

## Testing semantic settling dynamics model predictions – homonym meaning uncertainty

Most of the semantic ambiguity research resulted in inconsistent findings. In order to account for those variations, Armstrong and Plaut (2016) suggested Semantic Settling Dynamics (SSD) model which predicts the dependence between ambiguity effects and time spent in semantic processing. Therefore, compared to the processing of unambiguous words, isolated polysemous words (multiple related senses) should show large facilitatory effect in early processing, which would decrease and eventually disappear. On the other hand, homonymous words (multiple unrelated meanings) should show no early effects, whereas inhibitory effect should appear later and increase during the course of processing. The model was tested behaviorally by comparing tasks with different processing demands. Typically, visual lexical decision task (LDT) was used to show effects expected in early processing, whereas some modification of this task was applied to prolong processing and reveal effects from later phases. Initial model testing in Serbian focused on polysemy described by a continuous measure – entropy (low entropy: a few senses, unbalanced sense probabilities; high entropy: many senses, balanced sense probabilities; Filipović Đurđević 2007, 2015). In this case, the model successfully predicted effect change in later processing (auditory LDT, compared to visual).

The aim of this research was to test model prediction regarding homonymy by using the same design and same prolonging method. Furthermore, we tested two additional measures, components of entropy – number of meanings (NoM) and redundancy (low: balanced meaning probabilities; high: highly unbalanced probabilities). We presented 52 homonyms (2-5 meanings listed by native speakers) to 141 participants in two conditions, visual (baseline) and auditory (experimental) LDT.

The results revealed that processing in the experimental condition (auditory LDT) was significantly longer as compared to the baseline condition (visual LDT). We observed the predicted interaction of task and redundancy: in visual LDT, there was no effect of redundancy ( $\beta = .021$ ; S.E. = .012;  $df = 27.067$ ;  $t = 1.661$ ;  $p = .11$ ), whereas facilitatory effect of redundancy was found in auditory LDT ( $\beta = -.052$ ; S.E. = .019;  $df = 31.892$ ;  $t = -2.785$ ;  $p = .01$ ). Consistent with previous results in Serbian (Filipović Đurđević, 2015) no entropy and no NoM effects were found. Crucially, the observed redundancy effects were completely in line with model prediction – no early effects (visual LDT), and facilitatory effect later in processing (auditory LDT). This facilitation stems from the fact that low redundancy homonyms are the polar opposite of unambiguous words. With an increase in redundancy, i.e. one of the meanings becoming more probable, a word will be processed more like an unambiguous word.

**Keywords:** homonymy, semantic ambiguity, Semantic Settling Dynamics mode, redundancy

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Nikola Milosavljević, Jelka Stojanov, Sara Stanisavljević, Ana Vilotijević

*Department of Psychology, Faculty of Philosophy, University of Belgrade*

*Email: nikola.milosavljevic@f.bg.ac.rs*

## Lying and cognitive biases: Conscious cognitive deception and unconscious cognitive illusions

Lying has been hypothesized to induce a greater cognitive load in comparison to truth-telling, due to the fact that the person has to simultaneously inhibit a truthful version of the story and produce a convincing lie instead. As cognitive biases have been shown to occur in the state of cognitive load, in the present study we propose an alternative paradigm for lie detection that is based on the likelihood of resorting to heuristic processing. The present study employs a repeated factorial design with one within-subject factor (cognitive load with three levels: lying, truth-

telling, verbal series). During the lying task, participants were asked to describe the same fictitious event as it had really happened, the truth-telling task required them to retell a previously read story, while the verbal series task (Stevanović et al., 1988) was used as a reference point, to induce cognitive load that is not saturated with social requirements (e.g. the pressure to be credible). Cognitive biases were operationalized through two types of syllogisms: logically valid, but implausible, and logically invalid, but plausible syllogisms. The dependent variable in this study were accuracy scores for syllogisms. Total of 77 participants were recruited to complete all three tasks in a randomized order, during which they were interrupted in irregular intervals to solve syllogisms that were constructed to be semantically related to the content they were producing. No differences in accuracy scores were observed between the three conditions ( $F(2,116) = .096, p = .909$ ). Subsequent analysis on an independent sample ( $N=55$ ) showed that, even though the syllogisms followed the same logical structure, the variation of content led to them not being equally complex ( $F(2,108) = 5.838, p < .01$ ), with syllogisms associated with truth-telling condition being significantly less demanding compared to the other two conditions ( $p < .05$ ). For this reason, the demonstrated results should be taken with caution and future researchers should seek to further explore lie detection in this paradigm. Ecological validity should be taken into account in future studies, with special attention devoted to the participants' motivation while lying. This could potentially be improved by employing different audio-visual recording techniques, or by having an unfamiliar person present during the experiment itself. Finally, in order to test the entire scope of belief bias, additional two types of syllogisms (logically valid and plausible; logically invalid and implausible) should also be used in future studies.

Keywords: cognitive biases, lying, syllogisms, heuristics

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Pavle Valerjev <sup>a</sup>, Marin Dujmović <sup>b</sup>

<sup>a</sup> *Department of Psychology, University of Zadar*

<sup>b</sup> *School of Psychological Science, University of Bristol*

Email: [valerjev@unizd.hr](mailto:valerjev@unizd.hr)

## Mathematical reasoning in the Even-Odd task: Bolstering mindware through strategy training

Recently, we introduced the Even-Odd task within the dual-process approach to reasoning. In this task participants are simply asked to judge, as fast as possible, whether the sum of two presented numbers is even or odd. The task has three main conditions; the even-even, odd-odd and even-odd combinations. It was proposed that the task cues different rapid processes in parallel with congruent or

conflicting outputs. In the even-even (e.g. 2+6) condition both mathematical processing and simple matching indicate that the sum is even, however, in the odd-odd combination (e.g. 5+3) a matching bias would lead to the conclusion that the sum is odd, while it is in fact even. Our previous experiment confirmed that the influence of this conflict is clearly measurable both through accuracy and response time, and that the effect is stronger in more complex versions of the task (double-digit when compared to single digit numbers). In this experiment we introduce training with an additional strategy in order to strengthen what Stanovich (2018) would refer to as mindware and bolster mathematical processes. Participants (N=59) were given explicit instructions that the even-even, as well as the odd-odd combinations always result in an even sum, while the even-odd combination is the only one resulting in an odd sum. They then completed trials with textual combinations (e.g. “even + even”) for further training. After the training they completed 128 trials in a 2 (single- vs double-digit numbers) × 3 (even-even vs odd-odd vs even-odd) experiment. We analyzed the results by comparing them to our previous experiment. The results showed that introducing the additional strategy training eliminated the decrease in accuracy due to digit number which was reflected in an experiment by digit number interaction ( $F(1, 113) = 5.58, p < .05$ ). The same finding was present for response times as well ( $F(1, 113) = 10.44, p < .01$ ), the difference in response times between single- and double-digit versions of the task was significantly smaller in this when compared to our previous experiment. This effect was particularly stronger in the odd-odd condition reflected in a three-way interaction ( $F(2, 226) = 7.26, p < .01$ ). However, introducing the strategy did not reduce the effect of heuristic reasoning through the matching bias. Participants were still less accurate and slower in the odd-odd and even-odd when compared to the even-even condition. The result is interesting because we expected the additional strategy to improve performance and reduce the impact of conflicting processes. This may be due to the new strategy not being fully incorporated and practiced. It also may be the case that the strategy simply produced responses in parallel rather than in conjunction with other mathematical processing. These and other considerations will be discussed within the dual-process approach to reasoning while demonstrating the robustness of the new task in differentiating between competing processes.

**Keywords:** mathematical reasoning, dual-process theory, mindware, matching bias, Even-Odd task



Vera Novković, Sandra Ilić, Kaja Damjanović

Laboratorija za Eksperimentalnu Psihologiju Filozofskog Fakulteta Univerziteta u Beogradu

Email: vera.novkovic7@gmail.com

## Eksperimentalna provera konceptata teorije izgleda – zone dobitka i gubitka u rizičnom odlučivanju

Teorija izgleda (TI) Kanemana i Tverskog je prvi psihološki deskriptivni model odlučivanja u uslovima rizika i pretpostavlja da ljudi donose odluke na osnovu subjektivne vrednosti (i verovatnoće) određenog ishoda – donosilac odluke (DO) će istu “objektivnu” vrednost drugačije doživljavati u zavisnosti od referentne tačke, što se najjasnije manifestuje u averziji prema gubitku. Teorija izgleda pretpostavlja dve zone odlučivanja: zonu gubitka i zonu dobitka u kojima se intenzitet averzije prema gubitku i posledična sklonost ka riziku razlikuju. U eksperimentalnoj situaciji, zonama gubitka i dobitka se manipuliše jezičkim uokviravanjem. U ovom istraživanju, cilj je bio da proverimo, ako u zoni gubitka ljudi jesu skloni riziku, kao što TI pretpostavlja, da li važi i obrnuto, tj. da kada ljudi biraju rizičnu opciju zaista jesu bili u zoni gubitka, i analogno za zonu dobitka i sigurnu opciju.

Uzorak je sačinjavalo 84 studenta (uzrasta  $M = 21.32$ ,  $SD = 7.477$ ), od čega su oko 70% činile žene, oko 30% muškarci. Stimulusi su bili specijalno konstruisani zadaci u kojima je opisana situacija u kojoj su fiktivni donosioci odluke bili suočeni sa rizičnim izborom, zatim koju su opciju izabrali fiktivni DO i kakav je ishod te odluke bio.

Nacrt je bio dvofaktorski i ponovljen, sa šest situacija nastalih ukrštanjem tri nivoa okvira i dva nivoa ishoda, sa procenom kvaliteta odluke i procenom stanja DO na semantičkom diferencijalu kao zavisnim varijablama. Zadatak ispitanika je bio da procene kvalitet odluke na sedmostepenoj Likertovoj skali, te da procene stanje DO u trenutku donošenja odluke na sedmostepenom semantičkom diferencijalu od 10 parova prideva.

Po pitanju kvaliteta odluke, pored toga što nije bilo interakcije faktora ( $p > .05$ ), odluke sa lošim ishodom su dosledno procenjivane kao manje kvalitetne od onih sa pozitivnim ishodom ( $F(2, 78) = 22.338$ ,  $p < .001$ ,  $\eta^2 = 0.364$ ). Kada govorimo o procenjeni stanja DO na skali semantičkog diferencijala, ispostavilo se da su donosioci odluke čiji su izbori rezultovali negativnim ishodom dosledno ocenjivani kao da su bili u gorem emotivnom stanju, tj. u zoni gubitka, od onih koji su donosili odluke koje su rezultovale pozitivnim ishodom (tj. bili u zoni dobitka) ( $F(2, 78) = 10.472$ ,  $p < .001$ ,  $\eta^2 = 0.211$ ). Takođe, najniže procene i kvaliteta odluke i stanja DO

registrovane su u situacijama kada je rizik rezultovao totalnim gubitkom, i da su najviše procene dobijali pozitivni ishodi rizičnih odluka.

Dobijeni rezultati su, shodno tome, opravdali pretpostavke teorije izgleda, tj. smeštanje donosioca odluke u zonu gubitka ili dobitka u skladu sa rizičnošću njegovih izbora. Dvostruka posrednost merenja – procena fiktivnog donosioca odluke, kroz indirektnu meru semantičkog diferencijala – ograničava izvedene zaključke, te naredne studije na ovu temu moraju prioritizovati formiranje mere koja će zonu gubitka i dobitka detektovati na direktniji način.

*Ključne reči:* Teorija izgleda, averzija prema gubitku, zona gubitka, zona dobitka, ishod, semantički diferencijal

## The Experimental verification of the concepts of the Prospect Theory - the gain and loss zones in risky decision-making

Prospect theory (PT), conceptualized by Kahneman and Tversky, the first descriptive model of risky decision-making, posits that people make decisions based on the subjective value (and probability) of a certain outcome: the decision maker (DM) will perceive the same “objective” value differently depending on his or hers reference point; which results in specific pattern of loss aversion. PT assumes the existence of two decision-making zones: the loss zone and the gain zone, in which the intensity of loss aversion and the DM’s subsequent risk-proneness differ. In an experimental setting, these zones are manipulated through linguistic framing. The goal of this study was to ascertain that, if DMs in the loss zone are more risk-seeking, as PT postulates, the opposite also stands – people who choose risky options really are in the loss zone, as well as that sure choices mean that the DM’s in the gain zone.

The sample were 84 students (age  $M = 21.32$ ,  $SD = 7.477$ ), of which around 70% was comprised of women. The materials were vignettes - specially constructed tasks consisting of a description of the situation in which fictional DMs were faced with a risky choice, the option they chose, and the resulting outcome.

In a two-factor repeated design, six situations were made by intersecting three levels of framing and two levels of outcome, with the estimation of decision quality and the estimation of the DMs state on a semantic differential as the dependent variables. The subjects’ task was to estimate decision quality on a seven-degree Likert scale, as well as to estimate the DM’s state in the moment of decision-making on a seven-degree semantic differential comprised of 10 pairs of adjectives.

When it comes to decision quality, aside from no factor interaction ( $p > .05$ ), decisions with a poor outcome were consistently deemed to be worse than those

which resulted in a positive outcome ( $F(2, 78) = 22.338, p < .001, \eta^2 = 0.364$ ). As for the assessment of the DM's state on a semantic differential, it turned out that the DMs whose choices resulted in a negative outcome were consistently thought to be in a worse emotional state, i.e. in the loss zone, than the DMs who made decisions resulting in positive outcomes (i.e. the gain zone) ( $F(2, 78) = 10.472, p < .001, \eta^2 = 0.211$ ). Also, the lowest estimates of both decision quality and the DM's state were recorded in the situations where risk resulted in total loss, as well as that the highest estimates were reserved for the positive outcomes of risky choices.

The results justify the assumptions of PT, i.e. the placement of a DM into either the loss or gain zone depending on the riskiness of his choices. The double indirectness of measurement – judging a fictional decision-maker through the indirect measure of semantic differential – limits the conclusions drawn and therefore the following studies on this subject must prioritize the development of a measure which will pinpoint the loss and gain zones clearly.

**Keywords:** Prospect theory, loss aversion, loss zone, gain zone, outcome, semantic differential

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**Maša Milas, Ana Šimunić**

*Odjel za psihologiju, Sveučilište u Zadru*

*Email: asimunic@unizd.hr*

## Kreativnost i učinak u Simonovom zadatku

U većini kognitivnih modela kreativnosti je istaknuto da su procesi različitog stupnja inhibitorne kontrole korisni u različitim fazama kreativnosti. Njihova fleksibilna izmjena se čini ključnom za kreativnost, no nalazi empirijskih istraživanja o odnosu inhibitorne kontrole i kreativnosti su nekonzistentni. Cilj ovog istraživanja je bio ispitati učinak inhibitorne kontrole mjerene Simonovim zadatkom s obzirom na individualne razlike u kreativnom ponašanju mjenom Inventarom kreativnih aktivnosti i postignuća (The Inventory of Creative Activities and Achievements – ICAA; Diedrich i sur., 2017). U istraživanju je sudjelovalo 105 studenata i 57 osoba iz mlade radne populacije. Provedene su trosmjerne analize varijance za ispitivanje vremena reakcije u Simonovom zadatku s obzirom na kongruentnost prethodnog i trenutnog pokušaja i rezultat na skalama kreativnih aktivnosti i postignuća. Značajnim su se pokazali glavni efekti kreativnih aktivnosti ( $F(1,160)=6, p<.05$ ), kongruentnosti prethodnog ( $F(1,160)=28.6, p<.01$ ) i kongruentnosti trenutnog



pokušaja ( $F(1,160)=91.6, p<.01$ ) te interakcija kongruentnosti prethodnog i trenutnog pokušaja ( $F(1,160)=220.6, p<.01$ ). Vrijeme reakcije u Simonovom zadatku u prosjeku je bilo kraće u kongruentnim nego u nekongruentnim pokušajima. Kada se u obzir uzme i kongruentnost prethodnog pokušaja, taj efekt je bio prisutan samo kada je prethodio kongruentni pokušaj, dok je u pokušajima koji su slijedili nakon nekongruentnih vrijeme reakcije bilo kraće u nekongruentnim nego u kongruentnim pokušajima. Taj efekt nije bio izraženiji kod kreativnijih u odnosu na manje kreativne sudionike, ali su sudionici natprosječnog rezultata na skali kreativnih aktivnosti u prosjeku reagirali sporije od pojedinaca ispodprosječnog rezultata. Učinak u zadatku se nije razlikovao s obzirom na rezultate na skali kreativnih postignuća. Moguće je da su u ovom istraživanju pojedinci iznadprosječnog rezultata na skali kreativnih aktivnosti reagirali sporije, jer im je, budući da se radilo o zadatku koji je zahtijevao inhibiciju interferirajućih informacija, fokus pažnje bio proširen. Također je moguće da se podjelom sudionika prema rezultatu na skali kreativnih aktivnosti postigla veća diferenciranost sudionika, zbog toga što se čestice na toj skali odnose na svakodnevne aktivnosti kojima se ne bave samo eminentni umjetnici. S obzirom na malen broj istraživanja o odnosu inhibitorne kontrole i kreativnog ponašanja, te njihove kontradiktorne nalaze, potrebno je još istraživanja kojima će se pokušati replicirati nalazi, posebno vezano uz Simonov zadatak.

*Ključne reči:* Kreativnost; Simonov zadatak; Inhibitorna kontrola

## Creativity and the Simon task performance

Most cognitive models of creativity postulate that different degree of controlled processing is required at different stages of creativity. Although flexible shifting between different processing types seems to be the most beneficial for creativity, results of empirical studies on the relation of inhibitory control and creativity are quite inconsistent. The aim of this study was to examine performance in the Simon task, which is considered to reflect inhibitory control, with regard to individual differences in creative behaviour measured by The Inventory of Creative Activities and Achievements (ICAA; Diedrich i sur., 2017). The study included 105 students and 57 younger working-age people. Three-way analyses of variance were carried out to investigate the reaction time in Simon's task given the congruence of the previous and current attempts and the results on the scales of creative activities and achievements. Statistically significant were the main effects of creative activity ( $F(1,160) = 6, p <.05$ ), the congruency of the previous ( $F(1,160) = 28.6, p <.01$ ) and congruency of the current attempt ( $F(1,160) = 91.6, p <.01$ ) and the interaction of the congruency of the previous and current attempts ( $F(1,160) = 220.6, p <.01$ ). The reaction time in Simon's task was on average shorter in congruent than in non-

congruent attempts. When considering the congruence of the previous attempt, this effect was only present when it was preceded by a congruent attempt, while in the attempts that followed after incongruous reaction times were shorter in non-congruent than in congruent attempts. This effect was not more pronounced in terms of more or less creative participants, but the participants of the above-average results on the scale of creative activities reacted on average more slowly than individuals below the average score. The task performance did not differ in view of the results on the scale of creative achievements. It is possible that in this research, individuals with above-average results on the scale of creative activity were slower because the focus of their attention was widened, since this was a task that required inhibition of interfering information. It is also possible that dividing participants according to the result on the scale of creative activities differentiates them better, because the items on this scale are related to everyday activities of not only eminent artists. Given the small number of researches on the relationship between inhibitory control and creative behavior and their contradictory findings, further research is needed to try to replicate the findings, particularly with regard to Simon's task.

**Keywords:** Creativity; Simon's task; Inhibitory control



PSIHOLOGIJA LIČNOSTI

PERSONALITY PSYCHOLOGY

Irena Ristić<sup>a</sup>, Miloš Milošević<sup>b</sup>

<sup>a</sup>*Fakultet dramskih umetnosti Univerzitet umetnosti u Beogradu*

<sup>b</sup>*Fakultet za fizičku kulturu i menadžment u sportu Univerzitet Singidunum*

Email: [ir.ristic@gmail.com](mailto:ir.ristic@gmail.com)

## Collective creativity and emphatic concern

Results show that collective creativity can vary depending on the quality of collaboration during generative processes, while the collaboration itself could be conditioned by the level of interpersonal reactivity of participants, more than by their individual abilities of creative thinking. Therefore, we have examined whether certain dimensions of interpersonal reactivity, especially Emphatic Concern, influence the collective creativity, and in what way. The research was carried out within two experimental sessions, with 28 students of the Faculty of Dramatic Arts in Belgrade. During first session, students filled out the questionnaire composed of Interpersonal Reactivity Index (IRI) for measuring four sub-dimensions (Perspective Taking, Fantasy, Emphatic Concern and Personal Distress), and also the Consequences Test for measuring the abilities of divergent thinking. During second session, students were divided into the 4-members groups, varied by interpersonal reactivity and divergent thinking abilities. They were exposed to 6 images, one at a time, selected from the Nencky Affective Picture System. For each image, the groups were asked to generate as many creative titles as they can, within time limitation of 10 minutes. After each image cycle, students rotated among themselves, so total number of groups was 24. All titles were categorized and assessed by the creativity coefficient, based on their originality. ANOVA confirmed main effect of Emphatic Concern to the level of collective creativity: groups with medium level of Emphatic Concern were more creative than low and high level groups [ $F(2,21)=4,85$ ;  $p<.05$ ]. Surprisingly and beyond all expectations, the effect of individual members' creativity has been also confirmed: groups with higher average score of individual creativity achieve less in terms of collective creativity [ $F(2,21)=4,97$ ;  $p<.05$ ]. The results unambiguously show that the quality of relations determines a reach of creative collaboration, far more than individual abilities, so further examination of collective creativity should be focused to the dynamic (emergent) aspects of generative processes.

**Keywords:** creativity, collective, interpersonal reactivity, empathy, generative process

Uroš Kovačević<sup>a</sup>, Janko Međedović<sup>b</sup>

<sup>a</sup>Deep-Dive market research company

<sup>b</sup>Institute of Criminological and Sociological Research

Email: uros.kovacevic.bg@gmail.com

## Childhood poverty and pregnancy planning moderate the link between personality and fertility

In answering one of the most puzzling questions of personality, existence of inter-individual variance in personality traits, behavioral ecology provides several theoretical frameworks - one of them is the state-dependent behavior model. A state can be any condition which influences the fitness outcomes of behavior; e.g. aggressive behavior may be adaptive in individuals with high body mass, but cooperative behavior can provide fitness benefits in low body mass individuals. Hence, the states may maintain behavioral variation on the population level. States can be internal (body size, metabolic rate, sex etc.) and external (resource availability, social competition etc.). In this study, we explored the link between personality and fertility (number of children) as a crucial fitness component; furthermore, we tested whether economic poverty in childhood, as an external state variable, and pregnancy planning as an internal state variable, can moderate this link. Respondents were asked to provide the number of children they have, the extent to which they planned having children and the level of childhood poverty. Personality traits were explored using the Mini IPIP-6 which assesses Honesty-Humility, Neuroticism, Extraversion, Agreeableness, Conscientiousness, and Openness. Previous research indicated that lower Honesty-Humility, Neuroticism, Agreeableness and Conscientiousness should have higher adaptive potential in a harsh environment and among persons who do not plan children. The sample (n=994) was gathered via an on-line panel by Deep-Dive agency in June 2018; the sample is nationally representative by gender (female 52%), age (18+, M=40.1, SD=12.8) and regions in Serbia.

First we set a regression model with personality traits, childhood poverty, pregnancy planning and demographic variables (sex, age and education) as the predictors while reproductive success was set as the criterion variable. The results of regression analysis ( $R^2=.35$ ;  $F(11,983)=26.79$ ;  $p<.001$ ) showed that number of children is associated with elevated Extraversion ( $\beta=0.06$ ;  $p<0.05$ ) and lower scores on Openness ( $\beta=-0.06$ ;  $p<0.05$ ). Furthermore, two interactions were detected. The first one described the moderation role of childhood poverty in the link between Honesty-Humility and reproductive success - honest individuals had elevated fertility in beneficial environment while dishonest ones had increased reproductive



success in the conditions of economic poverty. The second interaction captured the interplay between pregnancy planning, Conscientiousness and fertility: conscientious individuals had higher number of offspring if they planned their pregnancies while individuals with low Conscientiousness had elevated number of children if they did not planned reproduction. The results show explanatory potential of the state-dependent models in human personality ecology: in this case the states succeeded in explaining the variation in Honesty-Humility and Conscientiousness traits.

**Keywords:** state-dependent behavior models, personality traits, reproductive success, childhood poverty, pregnancy planning, human behavioral ecology

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**Janko Međedović**

*Institute of criminological and sociological research, Belgrade, Serbia*

*Email: [janko.medjedovic@fmk.edu.rs](mailto:janko.medjedovic@fmk.edu.rs)*

## Elevated body mass as a morphological indicator of fast life history trajectory

Previous research showed that body mass is an important morphological trait for fitness optimization, both in humans and other animals. However, the associations between body size and the broader set of life history parameters are rarely explored. Here, we propose that body mass is a part of fast life history trajectory – the fitness optimization pattern which emerges from harsh environment with a function to maximize reproductive output. To test this prediction we measured body mass (operationalized as a body mass index – BMI) and a set of life history indicators (family dysfunctions and childhood poverty as the indicators of environmental harshness; self-reported physical health, age of first menarche, the onset of sexual behavior, planned and observed timing of reproduction, total desired number of children, economic fear as a reason against having children, short-term mating success and reproductive success) in a large sample of reproductive individuals (N=1504; 32% males;  $M_{age}=27.20$ ;  $MD=9.2$ ). The data were collected via online survey.

Bivariate correlations showed that BMI was positively related to reproductive success ( $r=.19$ ;  $p<.01$ ), childhood poverty ( $r=.10$ ;  $p<.01$ ), and the short-term mating success ( $r=.23$ ;  $p<.01$ ); furthermore, it was negatively associated to physical health ( $r=-.11$ ;  $p<.01$ ), age of first menarche ( $r=-.11$ ;  $p<.01$ ), and the economic reasons against reproduction ( $r=-.15$ ;  $p<.01$ ). Inverse quadratic relations are found between

BMI, short term mating success ( $\beta_{\text{quadratic}}=-.07$ ;  $p<.01$ ) and the observed age of first reproduction ( $\beta_{\text{quadratic}}=-.14$ ;  $p<.05$ ): individuals with average body size had the highest short-term mating and age of first reproduction. The Network Analysis (network edges were estimated via partial correlations between the variables; adaptive lasso optimization was implemented to buffer spurious associations) confirmed that BMI is positively related to the short-term mating success, reproductive success and negatively with physical health and the economic fear as a reason against reproduction. Furthermore, centrality metrics showed that BMI has low centrality indices and thus, is a peripheral node in the network.

The present data are one of the first to confirm that body size is a morphological trait which participates in the fast life history trajectory of fitness optimization. Higher body size represents an adaptive response to depriving economic conditions in the childhood and contributes to maximization of the reproductive output. Body size may increase short-term mating success as well, but this may not be adaptive since it may lead to delaying of reproduction. Centrality analysis suggests that elevated body mass is a morphological correlate of fast life history, not an indicator of life history itself. However, all of these findings stand only for normal range of body mass because the number of underweight and overweight participants in the present sample was very low.

**Keywords:** body mass; life history theory, harsh environment; fitness; Network Analysis

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Nemanja Rebić, Marija V. Čolić, Ana Orlić

*Fakultet sporta i fizičkog vaspitanja, Univerzitet u Beogradu*

*Email: mrjcolic@gmail.com*

## Odnos fizičkog vežbanja, fizičkog self-koncepta i psihološkog dobrostanja

Prethodna istraživanja su pokazala da je fizičko vežbanje (FV) povezano sa pozitivnim psihološkim ishodom. Cilj ovog istraživanja bio je proveriti odnos između učestvovanja u organizovanom i samostalnom FV i psihološkog dobrostanja, pozitivnih i negativnih emocionalnih stanja, kao i različitih aspekata fizičkog samopoimanja.

Uzorak se sastojao od 74 ispitanika ( $\bar{z}=59$ ) prosečnog uzrasta  $M = 31.63$ . Za procenu psihološkog dobrostanja korišćen je upitnik Psychological Wellbeing (Ryff, 1989) sa

šest subskala: Autonomija, Usaglašenost sa okolinom, Lični rast, Pozitivni odnosi sa drugima, Smisao života i Samoprihvatanje. Pozitivna i negativna emocionalna stanja merena su upitnicima Depression, Anxiety & Stress Scale – DASS-21 (Lovibond & Lovibond, 1995) i PANAS-10 (Thompson, 2007). Upitnik za procenu fizičkog self-koncepta, Physical self-description questionnaire – PSDQ-S (Marsh et al., 2010) sastoji se od 11 subskala: zdravlje, koordinacija, fizička aktivnost, telesna debljina, sportska kompetentnost, izgled, snaga, fleksibilnost, izdržljivost, opšti fizički self-koncept i samopoštovanje. Dodatno, ispitanici su odgovarali na pitanja da li se, koliko često i u kom trajanju bave organizovanim i samostalnim FV. Na osnovu odgovora formirane su dve varijable sa po tri nivoa: ne bavi se, umereno se bavi, intenzivno se bavi organizovanim odnosno samostalnim fizičkim vežbanjem.

Za obradu podataka korišćena je ANOVA. Kada je u pitanju organizovano bavljenje FV, razlike između grupa na upitniku psihološkog dobrostanja se javljaju na subskalama Usaglašenost sa okolinom ( $F(2,71)=5.33, p<.01$ ), Lični rast ( $F(2,71)=6.49, p<.01$ ) i Samoprihvatanje ( $F(2,71)=3.76, p<.05$ ), kao i na merama pozitivnog afekta ( $F(2,71)=7.80, p<.01$ ), depresivnosti ( $F(2,71)=3.29, p<.05$ ) i stresa ( $F(2,71)=4.67, p<.05$ ). Dodatno, postoje značajne razlike na svim aspektima fizičkog samopoimanja osim zdravlja i telesne debljine (najmanje na subskali koordinacija,  $F(2,71)=4.14, p<.05$ , najveće na skali fizička aktivnost,  $F(2,71)=17.11, p<.01$ ). U pogledu samostalnog bavljenja fizičkim vežbanjem, na merama psihološkog dobrostanja razlike se javljaju na subskalama Usaglašenost sa okolinom ( $F(2,71)=6.97, p<.01$ ), Pozitivni odnosi sa drugima ( $F(2,71)=4.38, p<.01$ ) i Smisao života ( $F(2,71)=6.17, p<.01$ ), dok se na merama pozitivnih i negativnih emocionalnih stanja razlike javljaju samo na pozitivnim emocijama ( $F(2,71)=4.29, p<.05$ ). Na upitniku fizičkog samopoimanja, značajne razlike se javljaju na subskalama fizička aktivnost ( $F(2,71)=3.27, p<.01$ ) i izdržljivost ( $F(2,71)=3.78, p<.05$ ). Post hoc analize ukazuju na tendenciju da osobe koje se učestalije bave fizičkim vežbanjem imaju bolje skorove na svim merama na kojima postoje značajne razlike.

Dobijeni rezultati potvrđuju prethodne nalaze o povezanosti fizičkog vežbanja i pozitivnih psiholoških ishoda. Dodatno, u ovom istraživanju je pokazano da je organizovano bavljenje fizičkim vežbanjem povezano sa širim skupom mera pozitivnih ishoda naspram samostalnog.

*Ključne reči:* fizičko vežbanje, psihološko dobrostanje, fizički self-koncept

## The relationship between physical exercise, physical self-concept, and psychological well-being

Previous studies show that physical exercise (PE) is related to various positive psychological outcomes. The goal of this study was to examine the relationship

between participating in both organized physical training and free physical exercise (i.e. doing exercise on your own) and psychological well-being, positive and negative emotional states, as well as different aspects of physical self-concept.

The sample consisted of 74 participants ( $F=59$ ,  $M_{age} = 31.36$ ). Well-being was assessed with Psychological Wellbeing questionnaire (Ryff, 1989), consisting of six domains: Autonomy, Environmental Mastery, Personal Growth, Positive Relations with Others, Purpose in Life, and Self-acceptance. Depression, Anxiety and Stress Scale – DASS-21 (Lovibond & Lovibond, 1995) and PANAS-10 (Thompson, 2007) were used for positive and negative emotional states measurement. Participants also completed Physical self-description questionnaire – PSDQ-S (Marsh et al., 2010), which covers 11 domains: Health, Coordination, Physical Activity, Body Fat, Sport Competence, Appearance, Strength, Flexibility, Endurance, Global Physical Self-concept, and Self-esteem. Additionally, participants reported on their involvement and frequency and duration of involvement in both organized and free PE. The answers were combined to create two variables with three levels: not involved, moderately involved, and intensively involved in organized/free PE.

ANOVAs were used for data analysis. Regarding organized PE, there were significant differences between groups in three domains of well-being (Environmental Mastery,  $F(2,71)=5.33$ ,  $p<.01$ ; Personal Growth,  $F(2,71)=6.49$ ,  $p<.01$ ; and Self-acceptance,  $F(2,71)=3.76$ ,  $p<.05$ ), as well as on positive affect ( $F(2,71)=7.80$ ,  $p<.01$ ), depression ( $F(2,71)=3.29$ ,  $p<.05$ ) and stress measures ( $F(2,71)=4.67$ ,  $p<.05$ ). In addition, the groups differed in all aspects of physical self-concept except Health and Body fat (the smallest for Coordination,  $F(2,71)=4.14$ ,  $p<.05$ , the largest for Physical activity scale,  $F(2,71)=17.11$ ,  $p<.01$ ). With respect to free PE, differences between groups were significant in three wellbeing aspects: Environmental Mastery ( $F(2,71)=6.97$ ,  $p<.01$ ), Positive Relations with Others ( $F(2,71)=4.38$ ,  $p<.01$ ) and Purpose in Life ( $F(2,71)=6.17$ ,  $p<.01$ ), while among positive and negative affect measures differences were significant only for positive affect ( $F(2,71)=4.29$ ,  $p<.05$ ). However, only Physical Activity ( $F(2,71)=3.27$ ,  $p<.01$ ) and Endurance ( $F(2,71)=3.78$ ,  $p<.05$ ) scores from the PSDQ-S differed among groups. Post hoc analyses reveal that people involved in physical exercise more frequently have better scores on all measures where there was a statistically significant difference.

Study results support previous findings on the relationship between physical exercise and positive psychological outcomes. Moreover, this study shows that involvement in organized physical activity is related to a wider set of positive outcomes as compared to free exercise.

**Keywords:** physical exercise, psychological wellbeing, physical self-concept

Nemanja Šajinović, Milica Ludoški

Fakultet za pravne i poslovne studije dr Lazar Vrkatić

Email: [sajinovic.nemanja@gmail.com](mailto:sajinovic.nemanja@gmail.com)

## Polne razlike u usamljenosti, samopouzdanju i zavisnosti od društvenih mreža između pojedinaca koji igraju i koji ne igraju video igre

Već duži vremenski period istraživači nastoje da odgovore na pitanje da li osobe koje igraju video igrice poseduju specifičan sklop ličnosti, odnosno da li se po nekim karakteristikama razlikuju od onih koji ih ne igraju. Međutim, s obzirom na to da je tržište gejming industrije veliko i da je populacija gejmera veoma heterogena, potrebno je uzeti u obzir veliki broj specifičnih promenljivih iz domena sredine, karakteristika individue, ali i samih igrica. Kako raste broj gejmera iz populacije adolescenata, pogotovu onih ženskog pola, odlučili smo da ispitamo postoje li polne razlike u usamljenosti, samopouzdanju i zavisnosti od društvenih mreža kod onih koji igraju video igre i onih koji ne igraju video igre, s obzirom na to da se društveni odnosi i slika o sebi često ističu kao važni konstrukti u ovom razvojnom periodu.

Na uzorku od 601 ispitanika (57,4% žene, 31,6% igra video igre), starosti od 13 do 25 godina, primenjene su prevedena Current Thoughts Skala samopouzdanja, prevedena UCLA skala usamljenosti i skala Zavisnosti od društvenih mreža.

Sprovedena je dvofaktorska MANOVA gde su usamljenost, samopouzdanje i zavisnost od društvenih mreža bile u svojstvu zavisnih varijabli. Kada je u pitanju multivarijatni odnos tri varijable, nije dobijen statistički značajan interakcijski efekat pola i onih koji igraju ili ne igraju video igre. Statistički značajna interakcija je dobijena kod univarijatnog testa samo za samopouzdanje ( $F(2, 513)=5.18, p<.05$ ). Post hoc LSD analiza na marginalnim aritmetičkim sredinama je pokazala da postoje značajne razlike u odnosu na pol samo na poduzorku onih koji igraju igre, i to u korist muškaraca ( $F(1, 513)=6.4, p<.05$ ). Kako bi se preciznije analizirale dobijene razlike u samopouzdanju, sprovedena je još jedna dvofaktorska MANOVA, gde su zavisne varijable bile tri komponente samopouzdanja: uspeh, socijalni odnosi i izgled. Nije dobijena značajna interakcija kod multivarijatnog testa, ali je dobijena kada je u pitanju samopouzdanje zasnovano na izgledu ( $F(1, 593)=4.08, p<.05$ ). Žene imaju značajno niže skorove od muškaraca i to isključivo kod onih koji igraju igre ( $F(1, 593)=4.35, p<.05$ ).

Jedno od potencijalnih objašnjenja dobijenih rezultata bi moglo da bude da žene koje imaju niže samopouzdanje po pitanju izgleda koriste video igrice kako bi



pridobile mušku pažnju, koju su nesigurne da traže u realnom svetu. Pored toga, video igrice neretko omogućavaju igračima da kreiraju avatare po svojoj meri čime mogu da kompenzuju svoju nesigurnost, tako što će stvoriti i biti lik koji direktno oslikava njihove ideale lepote. Treba napomenuti da ovakav oblik istraživanja ne govori ništa o uzročno-posledičnim vezama i stoga je neophodno dodatno istražiti i produbiti ovu temu.

*Ključne reči:* video igre, usamljenost, samopouzdanje, društvene mreže

## Gender differences in loneliness, self-esteem, and social media addiction between subjects who play video games and those who do not

For a long period of time, many researchers are trying to answer a question, is there any specific personality type of people who play video games. However, since video game market is huge and population of gamers is very heterogeneous, it is necessary to take into account large number of specific independent variables such as environment, individual characteristics and the very games they play. Since the number of adolescent gamer is growing every day, especially female gamers, we decided to analyze and establish if there are gender differences in loneliness, self-esteem and social media addiction between subjects who play video games and those who do not, considering that social relations and self-image are often asserted as important factors in this development stage.

On a sample of 601 participants (57.4% female, 31.6% play video games), age 13 to 25, we used a translated version of Current Thoughts scale for self-esteem, a translated version of UCLA scale for loneliness and a Social Media Addiction scale.

We conducted a two-way MANOVA, in which Loneliness, Self-esteem and Social media addiction were used as dependent variables. When it comes to the multivariate relations between the three variables, there were no statistically significant interaction effects of gender and participants who do or do not play video games. On the other hand, a statistically important interaction was found on a univariate test, but only for self-esteem ( $F(2, 513)=5.18, p<.05$ ). Post hoc LSD analysis on marginal mean values showed measurable differences regarding gender. However, it was only within the subsample of participants who play video games, and it was in favor of the male participants ( $F(1, 513)=6.4, p<.05$ ). In order to analyze the gathered data for self-esteem more thoroughly, we conducted another two-way MANOVA. This time the dependent variables were three components of self-esteem: success, social relations and physical appearance. Even though no crucial interactions appeared after the multivariate test, it did appear with self-esteem based on physical appearance ( $F(1, 593)=4.08, p<.05$ ). Female subjects

scored much lower than male subjects, exclusively the males who do play video games ( $F(1, 593)=4.35, p<.05$ ).

One of many possible explanations for the results could be that the females who have lower self-esteem (regarding physical appearance) tend to use video games as a way of getting males' attention, for which they do not feel comfortable to ask in the real world. Furthermore, video games make it possible for the players to create avatars according to their preferences so that they can compensate their lack of self-esteem as well as become the character which represents their own aesthetic ideals. It should be noted that this type of research does not provide conclusion on casual links and further research is necessary.

*Keywords:* video games, loneliness, self-esteem, social media



PSIHOLOGIJA PERCEPCIJE I STATISTIKA

PSYCHOLOGY OF PERCEPTION AND STATISTICS

Dražen Domijan

*University of Rijeka, Rijeka, Croatia*

*Email: ddomijan@ffri.hr*

## A Neural Network Model of Illusory Line Motion

Illusory line motion (ILM) refers to the perception of motion in a bar that is presented all at once next to an inducing stimulus. There are several versions of the ILM. In a polarized gamma motion the bar is adjacent to only a single inducer. In a flesh ILM, the bar appears between two inducers and one of them is briefly flashed. In this work, a recurrent competitive map is developed to simulate the dynamics of ILM. The model is based on a winner-take-all (WTA) circuit with linear-threshold units. In addition, the model contains two novel computational elements: dendritic non-linearity that acts on the excitatory units and activity-dependent modulation of synaptic transmission between excitatory and inhibitory units. In the model, local excitation opposes global inhibition and enables enhanced activity to propagate on the path offered by the bar. Previously, the model was successfully applied in simulating the properties of attentional selection in the posterior parietal cortex. Here, computer simulations showed that the same model is capable of generating activity spreading away from the inducing stimulus. Activity spreading occurred either passively from the existing inducer or actively from the flesh. Therefore, polarized gamma motion and flesh ILM may share a common neural mechanism related to attentional selection. Moreover, the model exhibits sensitivity to the temporal relationship between flesh and the presentation of the bar. If the bar is presented simultaneously with the flesh, the ILM is abolished. In addition, activity enhancement in the model is consistent with cortical traveling waves observed in the visual cortex during perception of the ILM. However, important limitation of the model is that it cannot account for transformational apparent motion (TAM) where ILM is induced by matching the bar to an attribute of the inducing stimuli. Further modeling work is needed to capture the properties of TAM.

**Keywords:** Attention, Illusory Line Motion, Neural Network Model

Ivana Jakovljević<sup>a</sup>, Sunčica Zdravković<sup>b</sup>

<sup>a</sup>Department of Psychology, Faculty of Philosophy, Novi Sad; Laboratory for experimental psychology, Faculty of Philosophy, Novi Sad

<sup>b</sup>Department of Psychology, Faculty of Philosophy, Novi Sad; Laboratory for experimental psychology, Faculty of Philosophy, Novi Sad; Laboratory for experimental psychology, Faculty of Philosophy, Belgrade

Email: [ivana.jakovljevic@ff.uns.ac.rs](mailto:ivana.jakovljevic@ff.uns.ac.rs)

## Color naming in Serbian language

The aim of this study was to further explore the basic color term (BCT) inventory in the Serbian language. Previous results obtained with the color-eliciting task (Jakovljević & Zdravković, 2018) suggested that Serbian BCT inventory might be expanding to include more than Berlin and Key's 11 universal terms (1969), which is a tendency that has been observed for several other modern languages.

In this study, participants (19) performed a constrained naming task in which they were instructed to use monolexemic color terms to describe 367 colors from the Munsell Mercator projection. Each color was presented twice on the computer screen, in random order, and participants used the keyboard to type their answers. Participants reaction time (RT) was measured. For each color term, we calculated typical measures of basicness: frequency of occurrence, consistency (in naming one stimulus in two presentations) and consensus (inter-individual agreement in naming a single color stimuli). Within color categories with a perfect consensus, we determined focal colors (stimuli with the shortest RTs).

After we excluded terms that were not monolexemic like plavozeleno/bluegreen and non-color adjectives like tamna/dark the total of 79 different monolexemic color terms were used with average of 22.7 terms per participant. 11 universal BCTs (crvena/red, plava/blue, zelena/green, žuta/yellow, ljubičasta/purple, narandžasta/orange, crna/black, bela/white, siva/gray, roze/pink, braon/brown) showed frequency between 90% and 100% suggesting their basic status in the Serbian language. However, additional five terms showed remarkably high frequency of occurrence – tirkizna/turquoise: 84.2%, lila/lilac: 78.9%, bordo/bordeaux: 73.7%, oker/ochre: 73.7% and teget/darkblue: 63%. In 8 out of 11 universal BCTs, consistency in naming was found among all participants, high consistency was observed for terms braon/brown: 94.7%, narandžasta/orange: 94.7%, bela/white: 84.2%, but also for terms bordo/bordeaux: 73.7%, lila/lilac: 73.7% and tirkizna/turquoise: 63.2%. Perfect consensus in naming a single color stimulus with the same color term was found for stimuli within 11 universal BCTs but also for the term bordo/bordeaux.



Results of our study suggest that beside 11 universal BCTs, Serbian speakers frequently and consistently use at least four additional terms: bordo/bordeaux, lila/lilac, tirkizna/turquoise and oker/ochre. This finding puts the Serbian language into the group of modern languages whose color vocabularies are expanding due to communication needs, which makes the Serbian language suitable for the further investigation of the color-vocabulary evolving process in general.

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Keywords: basic color terms, Serbian language, color naming

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Tijana Todić Jakšić, Senka Kostić, Mina Manić

*Filozofski fakultet, Univerzitet u Prištini*

*Email: [tijana8504@yahoo.com](mailto:tijana8504@yahoo.com)*

## Tačnost klasifikacije pojmova različitih afektivnih valenci u zavisnosti od tipa vizuelne prezentacije i vrste emocije

Dosadašnje studije su pokazale da na efikasnost obavljanja zadatka može uticati emocionalni sadržaj koji je prikazan pre njega. Tačnije, prikazivanje uplašenog lica pozitivno utiče na egzekutivnu pažnju i povećava efikasnost izvršavanja zadatka koji ne zahteva veliko kognitivno angažovanje. Pretpostavlja se da preteći stimulusi angažuju adaptivne reakcije organizma. Cilj ovog istraživanja je ispitati da li prikazivanje facijalne ekspresije emocija (FEE) utiče na efikasnost klasifikacije pojmova po valenci. U istraživanju je korišćena tehnika primovanja u kojoj je prim stimulus prikaz facijalne ekspresije sreće ili straha (vrsta emocije) na fotografiji ili skici (tip vizuelne prezentacije) u kongruentnom ili inkongruentnom kontekstu sa metom. Stimulusi mete su pojmovi sa pozitivnom i negativnom emocionalnom valencom. Posle sukcesivnog izlaganja prima (1000ms) i mete, zadatak ispitanika je bio da klikom na taster miša klasifikuju pojam koji vide na ekranu kao prijatan ili neprijatan. U istraživanju je učestvovalo 26 studenata, uzrasta 18-25 godina, oba pola. Trofaktorskom analizom varijanse za ponovljena merenja utvrđeno je da je značajan efekat faktora kontekst ( $F(1,25)=6.299, p=.019$ ), kao i interakcija faktora kontekst, tip prezentacije i vrsta emocije ( $F(1,25)=7.129, p=.013$ ). Iako generalno postoji tendencija da je broj tačnih odgovora viši u kongruentnim kontekstima, interakcija pokazuje da su takve razlike značajne samo u nekim slučajevima. Rezultati naknadnih Sidakovih testova ukazuju da je broj tačnih odgovora viši ako je kao prim korišćena emocija sreće u kongruentnoj situaciji, ali samo na skici lica.

Nasuprot tome, kada je kao prim korišćena emocija straha, broj tačnih odgovora je viši u kongruentnoj situaciji samo na fotografiji lica. Najvišu tačnost ispitanici su pokazali u kongruentnim situacijama, kada su primovi bili fotografije obe FEE ili skica FE sreće. Ubedljivo najnižu tačnost pokazuje inkongruentna situacija sa primom fotografije FE straha, dok u istoj situaciji prim skice FE straha pokazuje prilično visok nivo tačnih odgovora. Na osnovu rezultata možemo da zaključimo da FEE pokazuju efekat primovanja, pojačavajući efikasnost klasifikovanja pojmova po valenci u kongruentnim i smanjujući efikasnost u inkongruentnim situacijama. Međutim, ovaj efekat zavisi od načina prikaza konkretne emocije, jer su neki prikazi verovatno informativniji za određene emocije. Tako je za emociju sreće efekat izraženiji na skici, a za emociju straha na fotografiji lica.

*Ključne reči:* afektivno primovanje, kontekst, sreća, strah, fotografija, skica

### Classification accuracy of the verbal material related to different affective valences in dependence of type of the visual presentation and kind of emotion

Previous studies showed that the efficiency in performing tasks can be affected by the emotional content shown before. More precisely, showing the scared face positively influences the executive attention and increases the efficiency in performing task that does not require much cognitive engagement. It is assumed that the threatening stimulus engages the adaptive reactions of the organism. The aim of this study is to examine whether presenting of different facial expression of emotion (FEE) influences the efficiency of classification of word by valence. In this research we used a technique of priming in which the prime stimulus is used to depict facial expression of happiness or fear (type of emotion) in a photograph or sketch (type of visual presentation) in a congruent or incongruent context with a target. Stimulus targets are words with a positive and negative emotional valence. After a successive exposition of prime (1000ms) and target, the task of the respondent was to classify the word on the screen as pleasant or unpleasant by clicking on the mouse button. The research involved 26 students, ages 18-25, both genders. Tri-factor variance analysis for repeated measurements showed that classification accuracy of the words is influenced by context ( $F(1,25)=6.299$ ,  $p=.019$ ,  $\eta^2 = .201$ ), as well as interactions of context, visual presentation type and type of emotion ( $F(1,25)= 7.129$ ,  $p = .013$ ,  $\eta^2 = .222$ ). Although there is generally a tendency that the number of accurate responses is higher in congruent contexts, the interaction showed that such differences were significant only in some cases. The results of subsequent Sidak post hoc tests indicate that the number of correct answers were higher when the emotion of happiness was used in the congruent situation, but only on the sketch of the face. By contrast, when the emotion of fear

was used as a prime, the number of correct responses was higher in the congruent situation, but only on the photographs of the face. Respondents showed the highest accuracy in congruent situations, when the primes were photographs of both FEE or sketch of FE happiness. The convincingly low accuracy was showed in incongruent situation when prime photograph of FE of fear was presented, while in the same situation, the prime sketch of FE of fear showed a fairly high level of accurate responses. Based on the results, we can conclude that the FEE show the effect of priming, increasing the efficiency of classifying words by valence in congruent and decreasing efficiency in incongruent situations. However, this effect depends on the way in which the particular emotions are shown, because some presentations are probably more informative for certain emotions. Therefore, for the FE of happiness, the effect is more pronounced on the sketch, and for the FE of fear in photograph of the face.

*Keywords:* affective priming, context, happiness, fear, photograph, sketch

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Tanja Jevremov, Nenad Jurić

*University of Novi Sad, Faculty of Philosophy, Department of psychology*

*Email:* [tanja.jevremov@ff.uns.ac.rs](mailto:tanja.jevremov@ff.uns.ac.rs)

## Application of artificial neural networks in psychology

The area of artificial neural networks (ANN) has a vivid development and significant contribution to various scientific and technological areas. Psychology had some influence in early development of basic ideas of this technique, mainly because of ANN analogy with learning processes. Considering that ANN method enables learning information and prediction of outcomes as well as dealing with self-assessment data, it is potentially suitable for using in various psychology issues, such as clinical diagnostics and professional selection. However, it seems that those potentials of applications of ANN in psychology are insufficiently used. The aim of this research was to explore the usage of ANN in psychology by using bibliographic mapping technique.

Data were collected from the articles published in psychology' journals indexed in Scopus database. The sample of 503 articles was selected using query criteria that article must contain term artificial neural network, or terms which describe different types or technical procedures of ANN (like deep or ReLU) in their titles, articles or authors' keywords. The information about the journals which those articles cited and descriptors of their content represented by keywords and terms

derived from titles and abstracts was extracted. The base knowledge on which researches presented in the sample of the articles relied on was explored using co-citation relations among cited journals, which were visually represented on a co-citation map of journals. The main research topics are investigated using co-occurrence of descriptors, which were also visually represented on a map of terms. VOSviewer software (<http://www.vosviewer.com/>) was used for construction of bibliographic maps.

The co-citation map of journals shows that appliance of ANN in psychology is based mostly on cooperation with other fields, especially neurosciences and brain research, computer sciences including human-computer interaction, and expert systems applications. The map of terms has unclear structure and is generally saturated with terms which describe methodological ANN's concepts. Although it is hardly to identify research topics related to particular psychological problems, two areas are appeared to be those that recognize the benefits from using ANN. The first one is cognitive psychology, particularly issues of visual perception and language, which is connected to ANN by their common subject of information processing. The second one includes areas with practical needs for diagnostics and risk assessment, such as appearance of diseases (e.g. Alzheimer's disease), traffic safety, insurance risk analysis, and sale forecasting, which are linked to ANN by their methodological solutions for prediction and classification.

The results demonstrated the importance of interdisciplinary approach in application of ANN. The constructed maps indicated their relatively limited use in psychology, but also revealed some possible directions of its development.

**Keywords:** artificial neural networks, Scopus database, co-citation analysis, co-occurrence analysis, bibliographic mapping

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Miloš Milošević<sup>a</sup>, Irena Ristić<sup>b</sup>

<sup>a</sup>Fakultet za fizičku kulturu i menadžment u sportu Univerziteta Singidunum

<sup>b</sup>Fakultet dramskih umetnosti Univerzitet umetnosti u Beogradu

Email: [ir.ristic@gmail.com](mailto:ir.ristic@gmail.com)

## Provera konstrukt validnosti koeficijenta izuzetnosti

Koeficijent izuzetnosti (KI) je izvedena mera kreativnosti produkta zasnovana na statističkoj proceni originalnosti. Postupak njegove konstrukcije zasniva se na kategorizaciji produkata po sličnosti, uz proveru intencionalnosti, nakon čega sledi

izvođenje mere kreativnosti pojedinačnih produkata ili odgovora kao količnika broja 1 i broja ispitanika koji su dali isti odgovor. Ako ispitanik ne produkuje ni jedan odgovor KI jednak je 0. U dosadašnjim validacionim studijama potvrđene su dobre metrijske karakteristike u proceni verbalnih i likovnih produkata. Cilj ovog rada je da testira konstrukt validnost koeficijenta izuzetnosti poređenjem sa merama izvedenim iz standardnog načina obrade testova divergentnog mišljenja. Istraživanje je sprovedeno na prigodnom uzorku ( $N=64$ ) koji je sastavljen od poduzorka umetničke populacije studenata FDU ( $n_1=33$ ), i poduzorka opšte populacije studenata FFKMS Univerziteta Singidunum ( $n_2=31$ ). Studenti su rešavali zadatak iz Testa posledica predviđenog za merenje različitih sposobnosti divergentnog mišljenja, odnosno dobili su instrukciju da produkuju što više kreativnih odgovora na pitanje „Šta bi se desilo kada više niko nikada ne bi spavao?“. Za svakog ispitanika po standardnoj proceduri obrade izvedeni su skorovi: fluentnosti (ukupan broj ideja), fleksibilnosti (broj korišćenih kategorija), originalnosti (broj jedinstvenih ideja u odnosu na sve produkovane u uzorku ispitanika, gde se jedinstven odgovor ocenjuje sa 2, odgovor koji se javlja samo 2 puta sa 1 a svi ostali odgovori koji se javljaju više od 2 puta sa 0). Izveden je i korigovan skor originalnosti zasnovan na količniku originalnosti i fluentnosti (KO). Primenom KI izračunata je kreativnost svakog pojedinačnog odgovora i ukupan skor kreativnosti ispitanika kao suma KI svih odgovora koje je ispitanik produkovao. Korelacionom analizom utvrđena je visoka pozitivna korelacija KI sa fluentnošću ( $r=0.81$ ;  $p<0.01$ ), fleksibilnošću ( $r=0.84$ ;  $p<0.01$ ), originalnošću ( $r=0.98$ ;  $p<0.01$ ), kao i sa KO ( $r=0.87$ ;  $p<0.01$ ). KO pozitivno korelira sa fluentnošću ( $r=0.53$ ;  $p<0.01$ ), fleksibilnošću ( $r=0.67$ ;  $p<0.01$ ) i originalnošću ( $r=0.92$ ;  $p<0.01$ ). Rezultati potvrđuju konvergentnu validnost KI, koji omogućuje objektivno procenjivanje kreativnih produkata. S obzirom na to da postoji visoka korelacija sa merom originalnosti, divergentna validnost KI je upitna. Ipak mera originalnosti odgovora može imati samo tri vrednosti, dok KI ima opseg od 0-1 što pruža mogućnost za viši stepen preciznosti i diskriminativnosti. Ovo potvrđuju i rezultati deskriptivne statističke analize, gde prema spljoštenosti originalnost značajno odstupa od normalne raspodele ( $RKU=1.34$ ,  $SE\tau=0.56$ ) za razliku od KI ( $RKU=0.86$ ,  $SE\tau=0.56$ ). Na osnovu korelacione analize može se zaključiti da se KI pokazao i kao bolji reprezent sposobnosti divergentnog mišljenja spram KO. Ipak, kao i standardan način izračunavanja skorova na testovima divergentne produkcije, KI se ne može koristiti za poređenje uzoraka različite veličine.

*Ključne reči:* kreativnost, originalnost, divergentno mišljenje, koeficijent izuzetnosti, konstrukt validnost

## Testing a construct validity of the uniqueness coefficient

The Uniqueness Coefficient (UC) is a derived measure of product creativity based on statistical assessment of originality. The construction starts with categorization of products by similarity, with the test of intentionality, followed by the calculation of UC for individual products or answers as the quotient of 1 and the number of same answers. In case that the respondent does not produce a single answers, the UC is equal to 0. In the previous validation studies with drawings and verbal products, good metric characteristics of UC were verified. The aim of this paper is to test the construct validity of a UC by comparing it with measures derived from the standard way of processing divergent thinking tests. The research was conducted with the sample of students (N=64) composed of a sub-sample of the artistic population (n1=33), and a sub-sample of the general students population (n2=31). Task for students was derived from the Test of Consequences for measuring different abilities of divergent thinking: the students were instructed to generate as many creative answers as they can to the question "What would happen when no one ever sleep again?". The answers were categorized, and then standard procedure was applied: measures for divergent thinking abilities for each respondent were calculated for fluency (total number of ideas), flexibility (number of categories used), originality (number of unique ideas versus all produced in the sample, where a unique response is evaluated with 2, an answer that only occurs twice with 1 and all the other answers that occur more than twice with 0). Corrected score of originality (CO) based on the ratio of originality and fluency was also calculated. The creativity of each individual answer was calculated by applying the UC, while total score of creativity for individual respondent was calculated as the sum of UC of all answers generated by the respondent. Analysis showed high correlation of UC with fluency ( $r=0.81$ ;  $p<0.01$ ), flexibility ( $r=0.84$ ;  $p<0.01$ ), originality ( $r=0.98$ ;  $p<0.01$ ), and CO ( $r=0.87$   $p<0.01$ ). CO correlates with fluency ( $r=0.53$ ;  $p<0.01$ ), flexibility ( $r=0.67$ ;  $p<0.01$ ) and originality ( $r=0.92$ ;  $p<0.01$ ). The results confirm the convergent validity of UC. Since there is a high correlation with the degree of originality, the divergent validity of the UC is questionable. Since originality can only have three values, while the UC has a range of 0-1 it enables a higher degree of accuracy and discrimination. This is confirmed by the results of descriptive statistical analysis: according to kurtosis the originality deviates significantly from the normal distribution (RKU=1.34, SE=0.56) opposed to the UC (RKU=0.86, SE=0.56). According to correlation analysis, UC has proved to be a better representative of the abilities of divergent thinking comparing to CO, but it is not adequate for comparing samples of different sizes, as well as standard procedure for calculating scores in divergent thinking tests.

**Keywords:** creativity, originality, divergent thinking, Uniqueness Coefficient, construct validity



RAZVOJNA I PEDAGOŠKA PSIHOLOGIJA

DEVELOPMENTAL AND EDUCATION PSYCHOLOGY



Vojin Simunović, Vladimir Jovanović

Filozofski fakultet Univerziteta u Beogradu

Email: [vojin.simunovic@gmail.com](mailto:vojin.simunovic@gmail.com)

## Dečja tumačenja fobija

Iako je razumevanje tuđih uverenja jedna od ključnih oblasti u proučavanju socijalne kognicije (teorije uma), pažnja istraživača dosad je zaobišla jednu klasu uverenja – iracionalna uverenja. Zato smo, na uzorku dece iz Beograda (po 20-oro dece od 5, 7 i 9 godina), ispitivali razumevanje tuđih iracionalnih strahova (fobija). Deci su čitane 3 priče u kojima se osoba koja ima neku fobiju (klaustrofobiju, akrofobiju ili agorafobiju) susreće sa objektom fobije, doživljava strah pa napušta situaciju. Zatim smo im postavljali pitanja da bismo utvrdili kako tumače fobiju kod lika iz priče. Iz statističkih analiza isključeni su neodređeni odgovori (“ne znam”, “ne mogu da kažem” i sl.) na svako pitanje.

Rezultati pokazuju da deca uglavnom smatraju da lik iz priče ima (pogrešno) uverenje da će mu se desiti nešto što zaista može da se desi (npr. da se zaglavi u liftu) a ne (iracionalno) uverenje da će mu se desiti nešto što (skoro nikad) ne može da se desi (npr. da se uguši u liftu). Većina odgovora dece na svim uzrastima (78.26% na uzrastu od 5 godina ( $\chi^2(1, N = 46) = 14.696; p = .000$ ), 68.63% na uzrastu od 7 godina ( $\chi^2(1, N = 51) = 13.889; p = .000$ ) i 67.27% na uzrastu od 9 godina ( $\chi^2(1, N = 55) = 6.564; p = .01$ ) upućuje na to da je mala verovatnoća da se desi to čega se lik iz priče plaši. Nastanak fobija je u značajnoj većini odgovora dece od 7 (81.58%;  $\chi^2(1, N = 38) = 15.158; p = .000$ ), i 9 godina (68.09%;  $\chi^2(1, N = 47) = 6.149; p = .013$ ) objašnjavan sa “bihejviorističkog” stanovišta. Na pitanje kako da strah bude trajno prevaziđen, odgovor je dalo tek 31.7% dece od 5 godina (70% na uzrastu od 7 i 56.7% na uzrastu od 9 godina), dok su ostali predlagali da lik iz priče treba da izbegava objekat fobije, da primeni postupke za samoregulaciju straha itd. Među predlozima za trajno prevazilaženje strah, na uzrastu dece od 7 (88.1%;  $\chi^2(1, N = 42) = 24.381; p = .000$ ) i 9 godina (94.1%;  $\chi^2(1, N = 34) = 26.471; p = .000$ ) najviše je onih koji upućuju na “bihejviorističke” metode.

Dobijene rezultate protumačili smo kao pokazatelj toga da deca na ispitivanim uzrastima ispoljavaju „objektivizam“ u tumačenju fobija: liku iz priče pripisuju pogrešno uverenje da će mu se desiti nešto što objektivno može da se desi, verovatnoću za to ocenjuju kao malu (što takođe jeste objektivno tačno), nastanak fobije tumače kao posledicu realnog negativnog iskustva sa objektom fobije, a za prevazilaženje fobije predlažu da lik iz priče bude dovoljno dugo izložen objektu fobije a da se ne desi ništa loše. Deca na ovim uzrastima, dakle, pokazuju

ograničeno razumevanje fobija, i u svojim tumačenjima ne približavaju se poimanju iracionalnih uverenja.

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*Ključne reči:* socijalna kognicija, razumevanje tuđih uverenja, iracionalna uverenja, fobije, teorija uma

## Children's interpretation of phobias

The understanding of other people's beliefs is one of the key areas in the studies of social cognition (theory of mind). Despite of that, one kind of beliefs - irrational beliefs, has not attracted the attention of the researchers so far. That is why we examined the understanding of irrational fears (phobias) on the sample of children from Belgrade (20 children aged: 5, 7 and 9 years). The children heard 3 stories in which a person with a phobia (claustrophobia, acrofobia or agoraphobia) encounters the object of phobia, gets scared and leaves the situation. Then we asked them questions to determine how they interpret phobia of the character from the story. Undefined answers (I don't know, I can't say etc.) were excluded from the statistical analysis.

The results show that children generally think that the character has a (wrong) belief that something that could really happen (eg. to get stuck in the elevator) will happen to him and not (irrational) belief that something that almost never could happen (eg. to suffocate in the elevator) will happen. Majority of answers at all ages (78.26% at the age of 5 ( $\chi^2(1, N = 46) = 14.696; p = .000$ ), 68.63% at the age of 7 ( $\chi^2(1, N = 51) = 13.889; p = .000$ ), and 67.27% at the age of 9 ( $\chi^2(1, N = 55) = 6.564; p = .01$ ) suggests that it is low probability to happen that what is the character afraid of. Majority of children aged 7 (81.58%;  $\chi^2(1, N = 38) = 15.158; p = .000$ ) and 9 years (68.09%;  $\chi^2(1, N = 47) = 6.149; p = .013$ ), interpreted the emergence of phobia in the "behaviouristic" way. When asked how to permanently overcome the fear, only 31.7% of children aged 5 years gave an answer (70% at the age of 7 and 56.7% at the age of 9), while the rest of them suggested that the character from the story should avoid the object of phobia, apply self-regulation procedures etc. The majority of children at the age of 7 (88.1%;  $\chi^2(1, N = 42) = 24.381; p = .000$ ) and 9 years (94.1%;  $\chi^2(1, N = 34) = 26.471; p = .000$ ) suggested "behaviouristic" ways for permanent overcoming of fear.

The results were interpreted as indicating that children at these ages manifest "objectivism" in interpretation of phobias: to the character they attribute wrong belief that something that can really happen will happen to him, the probability for

that rate as a small (which is also true), the emergence of phobia interpret as a consequence of a real negative experience with the object, and for overcoming the phobia suggest that the character should be exposed to the object for a long time while nothing bad happens. They, therefore, manifest a restricted understanding of phobias, and do not approach the concept of irrational beliefs in their interpretations.

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**Keywords:** social cognition, understanding other people's beliefs, irrational beliefs, phobias, theory of mind

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Slavica Šimić Šašić

*Sveučilište u Zadru, Odjel za izobrazbu učitelja i odgojitelja*

*Email: [ssimic@unizd.hr](mailto:ssimic@unizd.hr)*

## Regulacija emocija kod djece predškolske dobi – uloga nekih osobnih i obiteljskih čimbenika

Učinkovito reguliranje emocija ključno je za uspješan razvoj djece te psihološku i socijalnu dobrobit. Regulacija emocija povezana je sa socijalnom kompetentnošću dok su teškoće u regulaciji emocija povezane s problemima u ponašanju. Čimbenici povezani s regulacijom emocija su osobne karakteristike djeteta kao što je temperament, ali i obiteljski čimbenici, npr. nizak socioekonomski status, obiteljski stres, zlostavljanje i slično. Stoga je cilj ovog istraživanja bio ispitati ulogu nekih osobnih (spol, temperament djeteta) i obiteljskih čimbenika (obrazovanje roditelja, roditeljsko ponašanje, roditeljska kompetentnost) u regulaciji emocija djece predškolske dobi.

U istraživanju je sudjelovao 391 roditelj djece u dobi od 5 do 7 godina. Roditelji su procjenjivali svoja ponašanja prema djetetu, roditeljsku kompetentnost, ali i temperament i regulaciju emocija svoje djece. Primijenjeni su sljedeći mjerni instrumenti: Upitnik roditeljskog ponašanja (Keresteš i sur. 2012), Skala osjećaja roditeljske kompetentnosti (Gibaud-Wallston i Wandersman, 1978), Upitnik dječjeg ponašanja (Rothbart, 1996) i ček lista emocionalne regulacije (Shields i Cicchetti, 1995).

Rezultati su pokazali da su temperament djeteta, roditeljska ponašanja i doživljaj roditeljske kompetentnosti povezani s emocionalnom regulacijom kod djece. Temperament je najsnažniji prediktor emocionalne regulacije (samostalni doprinos osobnih čimbenika u objašnjenju labilnosti je 46% a regulacije emocija 27%). Obiteljski čimbenici objašnjavaju dodatnih 7% varijance u oba slučaja. Emocionalna labilnost/negativnost povezana je s većom negativnom afektivnošću, višom razinom aktivnosti i impulzivnosti te slabijim ulaganjem napora. Također je povezana sa slabijom roditeljskom podrškom, manjom popustljivošću roditelja i slabijim zadovoljstvom roditeljskom ulogom. Emocionalna regulacija povezana je s nižom razinom negativne afektivnosti, većim ulaganjem napora i većom roditeljskom podrškom.

*Ključne reči:* regulacija emocija, temperament, roditeljska ponašanja, predškolska dob

## Regulation of emotions in preschool children - the role of some personal and family factors

Effective emotion regulation is crucial to the successful development of children and their psychological and social well-being. Emotion regulation is associated with social competence, while emotional regulation difficulties are associated with behavioral problems. Factors related to emotion regulation are the personal characteristics of a child such as temperament along with family factors such as low socioeconomic status, family stress, abuse and similar. Therefore, the aim of this study was to examine the role of some personal (gender, temperament of the child) and family factors (parenting, parental behavior, parental competence) in the regulation of emotions of preschool children.

The study included 391 parents of 5-7 year old children. The parents evaluated their behavior toward the child, parental competence, and their child's temperament and regulation of emotions. The following measuring instruments were applied: Parental Behavior Questionnaire (Keresteš et al., 2012), Parent Competency Skill (Gibaud-Wallston and Wandersman, 1978), Children's Behavior Questionnaire (Rothbart, 1996) and Emotion Regulation Checklist (Shields and Cicchetti, 1995).

The results showed that the temperament of the child, parental behavior and sense of parental competence are related to emotion regulation in children. Temperament is the most powerful predictor of emotion regulation (the independent contribution of personal factors in the explanation of lability is 46% and emotional regulation 27%). Family factors explain an additional 7% of the variance in both cases. Emotional lability / negativity is associated with greater negative affectivity, higher levels of activity and impulsiveness, and less effortful

control. It is also associated with poorer parenting support, lower parental permissiveness, and less satisfaction with the parental role. Emotion regulation is associated with a lower level of negative affectivity, greater effortful control, and greater parental support.

*Keywords: emotion regulation, temperament, parental behavior, preschool age*

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Gorana Rakić Bajić<sup>a</sup>, Manojlo Maravić<sup>b</sup>

<sup>a</sup>*Univerzitet u Kragujevcu, Fakultet medicinskih nauka, studijski program Psihologija*

<sup>b</sup>*Univerzitet u Novom Sadu, Akademija umetnosti, studijski program Dizajn video igara*

*Email: gorana.rakic@gmail.com*

## Bazične psihološke potrebe igrača video igara

Video-igre već duže vreme ne predstavljaju samo adolescentnu zabavu, a savremeni trendovi psiholoških istraživanja video-igara, osim bavljenja negativnim efektima prekomerne upotrebe video-igara uključuju i ispitivanje pozitivnih efekata igranja. Postojeći statistički podaci iz 2019. godine, prikupljeni na američkom uzorku, pokazuju da je prosečan uzrast igrača 34 godine, 45% su žene, a 70% igrača ima preko 18 godina. Takođe, dosadašnja ispitivanja pozitivnih efekata igranja pokazuju da se deo privlačnosti video-igara u izvesnoj meri može objasniti time što iskustvo igranja video-igara dovodi do zadovoljenja bazičnih potreba, odnosno do doživljaja autonomije, kompetencije i povezanosti, te shodno tome impliciraju da igranje video-igara može doprineti psihološkom blagostanju. S obzirom na to da su u našoj zemlji ispitivanja video-igara još uvek malobrojna, prikazano istraživanje je sprovedeno sa namerom da doprinese proširenju znanja o relevantnim psihološkim faktorima igranja video-igara, a osnovni cilj je bilo ispitivanje bazičnih psiholoških potreba igrača video-igara i njihove relacije sa demografskim faktorima, frekvencijom i načinom igranja. Uzorak je uključivao 484 odrasle osobe, 306 (63.2%) igrača video-igara (54.2% žena) i 178 (36.8%) neigrača video-igara. Prosečna starost igrača je bila 31 godinu. Najveći procenat igrača (41,8%) svakodnevno igra video-igre. 56% ispitanika na skali procene stepena prijatnosti tokom igranja izjavljuje da se za vreme igranja oseća veoma dobro ili dobro. Bazične psihološke potrebe su ispitivane Skalom bazičnih potreba - BPNS (Basic Psychological Needs Scale) Ryan-a i Deci-ja koja obuhvata tri supskale: Autonomija, Kompetentnost i Povezanost, a demografski i podaci o igračkim navikama upitnikom konstruisanim za potrebe istraživanja. Rezultati pokazuju statistički značajnu razliku između igrača i neigrača

u nivou Povezanosti ( $t(482,484) = 2.406, p < .05, \eta^2 = 0.01$ ) - neigrači video-igara su ispunjeniji svojim bliskim odnosima ( $MD = 32.65, SD = 4.22$ ) od igrača video igara ( $MD = 31.67, SD = 4.48$ ). U nivou Autonomije i Kompetentnosti nisu utvrđene statistički značajne razlike. Dalje analize su vršene samo na poduzorku igrača video-igara. Ispitivanje relacija demografskih varijabli i bazičnih psiholoških potreba je pokazalo da nema efekta pola, bračnog stanja i nivoa obrazovanja na Autonomiju, Komepetenciju i Povezanost. Na Autonomiju efekat imaju radni status ( $F(2,306) = 3.53, p = 0.03, \text{parc. } \eta^2 = 0,03$ ) i interakcija pola i bračnog stanja ( $F(2,306) = 4.749, p = 0.009, \text{parc. } \eta^2 = 0,03$ ). Frekvencija igranja video igara ima značajan efekat na Povezanost ( $F(2,306) = 5.973, p = 0.003, \text{parc. } \eta^2 = 0,04$ ), dok efekat načina igranja nije utvrđen. Na osnovu prethodnih rezultata možemo reći da u celokupnom uzorku igranje video-igara ima efekat samo na nivo Povezanosti, pri čemu su u poduzorku igrača oni koji umereno igraju video-igre najispunjeniji svojim bliskim relacijama.

*Ključne reči: bazične psihološke potrebe, video-igre, odrasli*

## The video games players' basic psychological needs

For quite some time now, playing video games isn't considered a mere adolescent pastime, while modern trends in psychological video games research, besides addressing the negative effects of video games overuse, also include examining the positive effects of playing games. 2019 US data show that the average player is 34 years old, 45% are women, and 70% of players are over 18 years old. Previous studies show that part of the video games attractiveness can to some extent be explained by the fact that the experience of playing leads to the satisfaction of basic needs - Autonomy, Competence and Relatedness, and accordingly, implies that playing video games can contribute to psychological well-being. The presented research intended to contribute to the broadening of knowledge about the relevant psychological factors of video game playing in Serbia. The main objective was to examine the basic psychological needs of video games players, and their relationship with demographic factors, frequency and mode of play. The sample included 484 adults, 306 (63.2%) video games players and 178 (36.8%) video games non-players. The average age of video games players was 31 years. The highest percentage of players (41.8%) play video games daily. 56% of respondents on the scale of assessment of the level of comfort during play state that they feel very good or good. Basic psychological needs were assessed by the Basic Psychological Needs Scale (Ryan and Deci), which includes three subscales: Autonomy, Competence and Relatedness. Demographic and data on game habits were assessed with a questionnaire designed for research purposes. The results show a statistically significant difference between players and non-players at the



level of Relatedness ( $t(482.484) = 2.406, p < .05, \eta^2 = 0.01$ ). Non-players were more fulfilling with their close relationship ( $MD = 32.65, SD = 4.22$ ) than video games players ( $MD = 31.67, SD = 4.48$ ). At the level of Autonomy and Competence, no statistically significant differences were found. Further analyses were carried out only on the sub-sample of video game players. There was no statistically significant effect of gender, marital status, and level of education on Autonomy, Competence and Relatedness. Working status ( $F(2.306) = 3.53, p = 0.03, \text{part. } \eta^2 = 0.03$ ) and the interaction of sex and marital status ( $F(2.306) = 4.749, p = 0.009, \text{part. } \eta^2 = 0.03$ ) had statistically significant effect on the Autonomy. The frequency of playing video games has a significant effect on Relatedness ( $F(2.306) = 5.973, p = 0.003, \text{part. } \eta^2 = 0.04$ ) - the players who play video games moderately are more fulfilled with their close relationships. The effect of playing mode has not been established. To sum up, results show that in the whole sample playing of the video games effect only on Relatedness, while in players subsample, participants with moderate video games use have the most fulfilling close relationship.

Keywords: video games, basic psychological needs, adults

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Ksenija Krstić<sup>a</sup>, Jelena Radišić<sup>b</sup>, Aleksandar Baucal<sup>a</sup>

<sup>a</sup>*Filozofski fakultet, Beograd*

<sup>b</sup>*Department of Teacher Education and School Research, Faculty of Educational Sciences, University of Oslo*

Email: [kkrstic@f.bg.ac.rs](mailto:kkrstic@f.bg.ac.rs)

## Matematika u osnovnoj školi: visoko odricanje, dosada i anksioznost

Matematička pismenost predstavlja jednu od ključnih kompetencija za opšte akademsko i profesionalno postignuće (Garon-Carrier, et al., 2016) kao i za celoživotno učenje (Videnović i Radišić, 2011). Ona se definiše kao sposobnost razvijanja i primene matematičkog mišljenja u cilju rešavanja niza problema u svakodnevnim situacijama (Baucal i Pavlović-Babić, 2011). Rezultati PISA testiranja pokazuju da naši učenici postižu oko 449 poena na testu iz matematike, što je za polovinu standardne devijacije slabiji rezultat u odnosu na OECD prosek. Da bismo bolje razumeli takve rezultate, u ovom istraživanju smo se fokusirali na motivaciju i akademske emocije u vezi sa učenjem matematike, učenika osnovne škole.

Cilj istraživanja bio je da se ispitaju odnosi i prediktivna vrednost motivacije za učenje matematike i akademskih emocija učenika osnovne škole za postignuće iz



matematike. Motivacija za učenje matematike je operacionalizovana u skladu sa osnovnim postavkama Teorije vrednosti i očekivanja Ekelseve i Vigfilda, a od akademskih emocija uključene su zadovoljstvo, dosada i anksioznost. Poseban cilj istraživanja je bio da se utvrdi kako se taj odnos između učeničkog postignuća, motivacije i emocija menja sa uzrastom, od trećeg do šestog razreda.

Uzorak je činilo 817 učenika, od trećeg do šestog razreda osnovnih škola (48.7% devojčica). Varijabla Motivacija za učenje matematike, obuhvatala je četiri dimenzije: zainteresovanost, vrednost, procena sposobnosti i odricanje (Eccles & Wigfield, 2002); od akademskih emocija obuhvaćene su osećanja zadovoljstva, anksioznosti i dosade u vezi sa tri situacije učenja matematike: na časovima, pri izradi domaćih zadataka i tokom provere znanja. Kao mera postignuća uzeta je ocena iz matematike zaključena na polugodištu tekuće godine. Nakon dobijanja saglasnosti za učešće u istraživanju od direktora škola, roditelja i učenika, učenici su na času popunjavali papir-olovka upitnik, koji se sastojao od: Skale motivacije (Expectancy-value motivational scale (EVMS)) i Upitnika o akademskim emocijama (Achievement Emotions Questionnaire (AEQ)).

Rezultati su pokazali da je postignuće iz matematike u pozitivnoj korelaciji sa dimenzijama motivacije zainteresovanost, vrednost i procena sposobnosti, kao i sa emocijom zadovoljstva, dok je u negativnoj korelaciji sa dimenzijom motivacije odricanje i emocijama dosade i anksioznosti. Sa uzrastom opada postignuće učenika iz matematike, motivacija za učenje i zadovoljstvo. Istovremeno, učenje matematike kod učenika sve više izaziva dosadu i anksioznost. U ovom istraživanju nisu utvrđene polne razlike ni na jednoj od ispitivanih varijabli. Regresiona analiza je kao značajne prediktore postignuća iz matematike izdvojila procenu sopstvenih sposobnosti, odricanje i anksioznost ( $R=.554$ ;  $R^2=.307$ ,  $p=.000$ ). Na osnovu klaster analize mogu se razlikovati tri grupe učenika, uzimajući u obzir različitost dimenzija motivacije i emocija.

*Ključne reči:* matematika, odricanje, samoprocena sposobnosti, anksioznost, dosada

## Mathematics in elementary school: high cost, boredom and anxiety

Mathematic Literacy is one of the key competences for general academic and professional achievement (Garon-Carrier, et al., 2016) as well as for lifelong learning (Videnović and Radišić, 2011). It is defined as the ability to develop and apply mathematical thinking in order to solve a number of problems in everyday situations (Baucal and Pavlović-Babić, 2011). The results of the PISA survey show that our students score about 449 points on the math test, which is half the

standard deviation less than the OECD average. In order to better understand this result, in this research we focused on motivation and academic emotions related to the learning of mathematics of elementary school students.

The aim of the research was to examine the relationships and the predictive value of motivation for learning mathematics and academic emotions of the primary school pupils for achievement in mathematics. The motivation for learning mathematics has been operationalized in accordance with the basic assumptions of the Expectancy-Value theory (Eccles & Wigfield, 2002), while academic emotion involved pleasure, boredom and anxiety. A particular aim of this investigation was to determine how this relationship between student achievement, motivation and emotions changes with age, from the third to the sixth grade.

The sample consisted of 817 pupils, from the third to the sixth grade of elementary schools (48.7% of girls). Variable Motivation for learning mathematics included four dimensions: interest, value, perceived competence and cost (Eccles & Wigfield, 2002); while academic emotions included feelings of satisfaction, anxiety and boredom in relation to three situations of learning mathematics: in classes, doing homework, and test situations. As a measure of achievement pupils' midterm score was obtained. After securing participation consent by the school principals, parents and pupils, participating pupils completed a paper-pen questionnaire, which consisted of Expectancy-value motivational scale (EVMS) and Achievement Emotions Questionnaire (AEQ).

The results showed that achievement in mathematics is in a positive correlation with the motivational dimensions of interest, value and perceived competence, as well as with the emotion of satisfaction, while negative correlation was registered with the cost dimension and emotions of boredom and anxiety. With grade, the pupils' achievement in mathematics decreases, as well as their motivation for learning and perceived satisfaction. At the same time, learning of mathematics is related with an increase in anxiety and boredom. In this study no gender differences were found regarding achievement, motivation or emotions. Regression analysis singled out the perceived competence, cost and anxiety as important predictors of achievement in mathematics ( $R = .554$ ;  $R^2 = .307$ ,  $p = .000$ ). Cluster analysis revealed three student groups which can be differentiated as to the diverse dimensions of motivation and emotion.

**Keywords:** Key words: mathematics, cost, perceived competence, anxiety, boredom

Ivona Nađ, Ilija Milovanović

*Department of Psychology, Faculty of Philosophy, University of Novi Sad*

*Email: ilijamilovanovic@ff.uns.ac.rs*

## Parent math self-efficacy: Structure and relations with math achievement and math anxiety in early elementary school children

Parents often report that they do not possess sufficient knowledge in the field of math to help the child learn math at home or do math homework. This can lead to lower math achievement and higher math anxiety in children, but the previous research did not directly examine these relations. Therefore, it seems that recognizing the involvement of parents in the process of math teaching at home is of great importance for the process of reducing the child's math anxiety. Additionally, gender differences studies indicate that the father's characteristics and behavior less contribute to the child math anxiety, but more to the child math achievement, compared to the characteristics of the mother. The aims of this research were to examine the factor structure of self-efficacy in parents and to investigate relations of parent math self-efficacy and child math anxiety and achievement in the early elementary school stage. Math Self-Efficacy Scale (MSES) and Modified Abbreviated Math Anxiety Scale (mAMAS; with the Math Evaluation and Math Learning Anxiety dimensions) were applied on a sample of 176 early elementary school-aged children (Mean age = 8.76), their mothers (Mean age = 37.20) and fathers (Mean age = 40.27). Children math achievement was calculated for every student by applying the average of math grades at half-term and the end of the school year. Results of the parallel analysis suggest unidimensional structure (61.23% explained variance for fathers and 67.63% for mothers) of MSES ( $\alpha = .88$  for fathers and  $.91$  for mothers). Multiple regression analysis indicate that mother's math self efficacy negatively contribute to math evaluation anxiety in children ( $\beta = -.23$ ,  $t = -2.72$ ,  $p < .01$ ), and that father's higher math self-efficacy contribute to higher children's math achievement ( $\beta = .22$ ,  $t = 2.60$ ,  $p < .01$ ). It seems that mother's math self-efficacy, and probably related behaviors, is more oriented to the children's math learning process itself, giving support for decreasing anxiety in the field of math evaluation, while the math self-efficacy of fathers is focused on the expectations of the child and on the learning outcomes and achievement. This result could have strong practical implications for parents involved in teaching math at home: the adaptive combination of the mother's and father's

manifestation of math self-efficacy could lead to higher math achievement and lower math anxiety in early elementary school children.

**Keywords:** early elementary school stage, math achievement, math anxiety, math self-efficacy, parents

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Jasmina Pekić, Ilija Milovanović, Jasmina Kodžopeljić

*Department of Psychology, Faculty of Philosophy, University of Novi Sad*

*Email: [jpekic@ff.uns.ac.rs](mailto:jpekic@ff.uns.ac.rs)*

## Relations between empathy and bystanders attitudes toward bullying in upper elementary school stage

According to some contemporary research results between 10% and 90% of students are in some way involved in the process of violent peer interaction during elementary school education. Although the percentage varies depending on the culture and type of violence, it is a worrying fact that a large number of adolescents (approximately 50-60%) do not report school violence or take part in as a passive observer – bystander, which contributes to the development of peer violence as a dysfunctional and repetitive form of conflict resolution among students. Previous results indicate that empathy is a significant determinant of different types of behavior in peer violence. A large number of studies show that bullies are characterized with low affective and cognitive empathy in relationships with others during early and middle adolescence, but the results are not so unambiguous in the case of other roles in violent interaction, especially in the case of bystanders. The aim of this research is to examine the relations between empathy and different motives of bystanders for non-participation in the process of peer violence. Bullying-Related Beliefs Scale (B-RBS; with the dimensions: Bullying as a Personal Matter, Non-possession of Conflict Resolution Skills, and Bullying as a Victims Responsibility) and Adolescent Measure of Empathy and Sympathy (AMES; with the dimensions: Cognitive Empathy, Affective Empathy, and Sympathy) were applied on a sample of 326 (42.9% boys) upper elementary school-aged children ( $M = 13.68$  years). The results of multiple regression analysis indicate that cognitive empathy significantly and negatively contributes to the student attitude that the bullying is a personal matter ( $\beta = -.20, p < .01$ ), and to believe that lack of conflict resolution skills determine non-participation in the process of peer violence ( $\beta = -.21, p < .01$ ). On the other hand, higher affective empathy contributes negatively to the attitude that being bullied is only victims responsibility ( $\beta = -.32, p$

< .01), while sympathy has a positive contribution to attitude about non-participation due to lack of conflict resolution skills ( $\beta = .12, p < .05$ ). The research findings can be used in the development of bullying prevention and intervention programs through reinforcing those kinds of beliefs that increase the individual's willingness to intervene in bullying situations, but also through interventions which promote different kinds of empathy in bystanding students.

**Keywords:** bullying, bystanders, empathy, upper elementary school stage

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Marina Oros, Marija Zotović, Jelica Petrović

*Odsek za psihologiju, Filozofski fakultet, Univerzitet u Novom Sadu*

*Email: marina.oros@ff.uns.ac.rs*

### Kriza srednjih godina: mit ili realnost

Cilj predstavljenog istraživanja je eksploracija fenomena krize srednjih godina. Pored same izraženosti indikatora krize srednjih godina, ispitano je da li postoje razlike između ispitanika koji smatraju da su iskusili znakove krize i onih koji nisu, u generalnom zadovoljstvu životom, odnosno stepenu subjektivnog blagostanja, kao i u pokazateljima opšteg zdravlja. U istraživanju je učestvovalo 350 ispitanika, od čega je 45% muškog i 55% ženskog pola, starosti 35-55 godina. Istraživanje je bilo anonimno, a sprovedeno je na teritoriji Srbije. Korišćeni su sledeći instrumenti: modifikovana i prilagođena Kineska skala krize srednjih godina (Shek, 1996); modifikovana skraćena Skala za procenu opšteg zdravlja (General health questionnaire, Goldberg, 1992) koja se sastoji od četiri supskale – somatski simptomi, anksioznost, socijalna disfunkcionalnost i depresivnost; Skala subjektivnog blagostanja (Diener et al., 1985); kao i upitnik osnovnih demografskih podataka. Pored toga, ispitanici su odgovarali na pitanje da li su kod sebe primetili neke promene koje smatraju znakom krize srednjih godina. Spram odgovora na ovo pitanje, uzorak je podeljen na dve grupe ispitanika – oni koji smatraju da jesu iskusili znakove krize srednjih godina (N=129) i oni koji nisu (N=221). Rezultati pokazuju da između ove dve grupe postoje statistički značajne razlike u izraženosti indikatora krize srednjih godina ( $t(293)=2.240, p \leq .05$ ), kao i na tri od četiri supskale opšteg zdravstvenog stanja: somatski simptomi ( $t(339)=2.293, p \leq .05$ ), anksioznost ( $t(343)=2.24, p \leq .001$ ), socijalna disfunkcionalnost ( $t(342)=3.065, p \leq .01$ ). Nisu dobijene statistički značajne razlike na supskali koja meri depresivnost, kao ni u opštem blagostanju. Dakle, grupa ispitanika koja za sebe smatra da je iskusila neke znake krize srednjih godina postiže više skorove na skali koja meri različite aspekte srednjih godina – zabrinutost zbog starenja, manje zadovoljstvo slobodnim

vremenom, brakom, poslom, slabljenje zdravlja i sl. Takođe, izveštavaju o prisutnijim somatskim problemima, višem stepenu anksioznosti i socijalne disfunkcionalnosti.

Dobijeni rezultati se diskutuju u svetlu pitanja o normativnosti krize srednjih godina. Postoje autori koji tvrde da je zabrinutost povodom mogućnosti da se doživi kriza srednjih godina zapravo zastupljenija nego samo iskustvo krize. Kros-kulturna istraživanja takođe ne pružaju podršku ideji da su srednje godine posebno stresan i težak period. Prikazani rezultati ukazuju na potrebu daljeg ispitivanja problematike razvoja u odraslom dobu, na našim prostorima. Naši rezultati pokazuju da ispitanici koji kod sebe prepoznaju nekakve znakove krize srednjih godina zaista postižu više rezultate na merama indikatora same krize, kao i njenim korelatima.

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*Ključne reči:* kriza srednjih godina, subjektivno blagostanje, opšte zdravlje

### Midlife crisis: myth or reality

The aim of the presented study was the exploration of midlife crisis in our culture. We explored the presence of indicators of midlife crisis and analyzed differences in subjective well-being and general health between subjects who reported to have experienced signs of crisis and those who did not. The sample consisted of 350 subjects (45% male and 55% female), aged 35-55. The data was collected anonymously, using the following instruments: modified and adapted Chinese midlife crisis scale (Shek, 1996); modified short version of General health questionnaire (Goldberg, 1992), which includes four subscales – somatic symptoms, anxiety, social dysfunction and depression; Satisfaction with life scale (Diener et al., 1985) and sociodemographic questionnaire. Subject also answered whether or not they have experienced any signs of midlife crisis. According to their answers, the sample was divided into two subsamples. The first group consisted of subjects that have experienced signs of midlife crisis (N=129) and the second group consisted of subjects who report no signs of midlife crises (N=221). The results show that there are significant differences between these two groups in presence of indicators of midlife crisis ( $t(293)=2.240, p \leq .05$ ), as well as in three subscales of general health: somatic symptoms ( $t(339)=2.293, p \leq .05$ ), anxiety ( $t(343)=2.24, p \leq .001$ ), social dysfunction ( $t(342)=3.065, p \leq .01$ ). No differences were found in depression and general life satisfaction. Subjects that reported experiencing signs of midlife crisis achieve higher scores on scales that measure various areas of

midlife crisis – worrying about aging, lower satisfaction with leisure time, marriage and work, health deterioration, etc. These subjects also reported more somatic symptoms and higher levels of anxiety and social dysfunction.

Our results are discussed in terms of the question of whether midlife crisis is a normative developmental phenomenon. Previous research suggests that concerns about the possibility of midlife crisis are actually more prevalent than the experience of crisis. Cross-cultural studies also lack support for the idea that middle life is a particularly stressful and difficult period. Presented study indicates the need for further research of development in adult age in our culture. Our results implicate that people who do recognize some symptoms as a sign of midlife crisis do achieve higher results on scales that measure indicators of midlife crisis and its correlates.

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Keywords: Midlife crisis, satisfaction with life, general health

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Kristina Randelović<sup>a</sup>, Nikola Goljović<sup>b</sup>, Nataša Mladenović<sup>c</sup>, Olivera Dimković<sup>b</sup>

<sup>a</sup>Univerzitet u Prištini sa privremenim sedištem u Kosovskoj Mitrovici, Filozofski fakultet, departman za psihologiju

<sup>b</sup>Univerzitet u Nišu, Filozofski fakultet, departman za psihologiju

<sup>c</sup>Univerzitet u Prištini sa privremenim sedištem u Kosovskoj Mitrovici, Učiteljski fakultet u Prizrenu sa privremenim sedištem u Leposaviću

Email: [kristina.randjelovic@pr.ac.rs](mailto:kristina.randjelovic@pr.ac.rs)

## Da li su žene u Srbiji srećne? Zadovoljstvo životom kod žena srednjeg životnog doba

Žene u srednjim godinama čine veliki deo populacije, one izvršavaju brojne i važne uloge, a pritom su izložene mnogim životnim promenama. Većina promena koje se događaju u srednjim godinama života je očekivana, ali ipak može imati efekat na subjektivno blagostanje osobe, odnosno na njeno ukupno zdravlje. Te promene kvalitativno su drugačije i u zavisnosti od starosti i očekivanja vezanih za životnu dob. Cilj ovog istraživanja jeste da ispita prosečne vrednosti kao i da ispita postojanje razlika u izraženosti odabranih komponenti subjektivnog blagostanja



(zadovoljstvo životom, samopoštovanje, anksioznost i depresivnost) kod žena mlađeg i starijeg srednjeg životnog doba. Uzorak je bio prigodan i činilo ga je 200 ispitanica srednjih godina, 100 žena pripada mlađem srednjem dobu - od 35 do 47 godina i 100 žena koje pripadaju starijem srednjem dobu od 48 do 60 godina. Od instrumenata su korišćene sledeće skale: Skala zadovoljstva životom, Skala globalnog samopoštovanja, za procenu anksioznosti Spilbergerov inventar anksioznosti – forma Y, Bekova skala za procenu depresivnosti. Ispitivanje aritmetičkih sredina i standardih devijacija odabranih komponenti subjektivnog blagostanja pokazuje da dimenzije pozitivnog afekta – Zadovoljstvo životom i Samopoštovanje imaju više aritmetičke sredine od teorijski pretpostavljenih, dok dimenzije negativnog afekta – Situaciona anksioznost, Opšta anksioznost i Depresivnost imaju niže aritmetičke sredine od teorijski pretpostavljenih. Ispitivanje postojanja razlika u stepenu izraženosti odabranih komponenti subjektivnog blagostanja između poduzoraka žena mlađeg i starijeg srednjeg životnog doba je pokazalo da postoje statistički značajne razlike na dimenzijama Zadovoljstvo životom ( $U=4155,00$ ,  $p<0,05$ ), Situaciona anksioznost ( $U=3956,00$ ,  $p<0,01$ ) i Depresivnost ( $U=3922,00$ ,  $p<0,01$ ). Dok ispitanice mlađe srednje dobi postižu više skorove na dimenziji Zadovoljstva životom, ispitanice starije srednje dobi postižu više skorove na dimenzijama Situaciona anksioznost i Depresivnost. Dobijeni rezultati potvrdili su hipotezu, prema kojoj je pretpostavljeno da su ispitanice srednje životne dobi zadovoljne svojim životima i da nemaju značajno izražene nepoželjne komponente subjektivnog blagostanja. Ipak, rezultati govore i u prilog druge hipoteze, a to je da su pripadnice mlađeg odraslog doba zadovoljnije svojim životom, od onih koje su starije, verovano zbog toga što različite izazove mogu lakše podneti. Ponekad se može činiti da je ovo period pun izazova u kojem je teško zadržati dobro raspoloženje, doživljavati prijatne emocije i biti zadovoljan u svakom domenu života. Međutim, izgleda da se čak i u ovom turbulentnom periodu mogu pronaći razlozi za sreću i blagostanje.

*Ključne reči:* zadovoljstvo životom, sreća, subjektivno blagostanje, žene

## Are Women in Serbia Happy? Satisfaction With Life in a Middle Age Woman

Women in middle age make up a large part of the population, they carry out numerous and important roles, and they are exposed to many life changes. Most of the changes that occur in middle age are expected, but they can have an effect on the person's subjective well-being, or mental health. These changes are qualitatively different, depending on age and expectations related to life expectancy. The aim of this research is to examine the average values as well as to examine the differences in selected components of subjective well-being

(satisfaction with life, self-esteem, anxiety and depression) in women of the younger and older middle age. The research sample was convenient and consisted of 200 middle-aged respondents, where 100 women belonged to the younger middle-aged group, from 35 to 47 years old and 100 women belonged to the older middle-aged group, from 48 to 60 years old. The following scales were used as research tools: The satisfaction with life scale, Rosenberg's Self-Esteem Scale, Spielberger's state anxiety inventory for the assessment of anxiety - Form Y, Beck Depression Inventory. Results show that there is a differences in selected components of subjective well-being between younger and older women, were statistically significant differences found on dimensions Satisfaction with life ( $U = 4155.00$ ,  $p < .05$ ), Situational anxiety ( $U = 3956.00$ ,  $p < .01$ ) and Depression ( $U = 3922.00$ ,  $p < .01$ ). While younger middle ages women achieve more scores on the Satisfaction with life dimension, older middle age women achieve more scores on the dimensions of Situational anxiety and Depression. The obtained results confirmed the hypothesis, according to which it is assumed that middle-aged women are satisfied with their lives and that they do not have significantly undesirable components of subjective well-being. However, the results also confirm another hypothesis, that is, members of the younger adult age more satisfied with their lives than older ones, they are believed to be able to handle different challenges more easily. Sometimes it may seem that this period is full of challenges in which it is difficult to maintain good mood, experience pleasant emotions and be satisfied in every area of life. However, it seems that even in this turbulent period, reasons for happiness and well-being can be found.

**Keywords:** life satisfaction, happiness, subjective well-being, women

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Jelena Opsenica Kostić, Milica Mitrović, Damjana Panić

*Filozofski fakultet Univeziteta u Nišu*

*Email: [jelena.opsenica.kostic@filfak.ni.ac.rs](mailto:jelena.opsenica.kostic@filfak.ni.ac.rs)*

## Kvalitet života žena u procesu vantelesne oplodnje

Sterilitet je fenomen čiji su medicinski, psihološki i socio-kulturni aspekti nerazdvojni. Na savremenim klinikama tretmanu steriliteta pristupa se individualno i holistički, dok je u Srbiji tretman još uvek gotovo potpuno fokusiran na medicinski aspekt. Cilj sprovedenog istraživanja je dobijanje podataka o kvalitetu života žena koje se nalaze u procesu vantelesne oplodnje, koja je, pored inseminacije, i dalje jedini postupak asistirane reprodukcije koji se sprovodi u zemlji. Pošto je korišćena skala namenjena ispitivanju kvaliteta života kod problema sa fertilitetom, ispitanicama u procesu VTO i kontrolnom uzorku ispitanica zadat je i niz upitnika

koji takođe govore o blagostanju, a kod kojih je poređenje ove dve grupe moguće. Ti dodatni upitnici iskorišćeni su i za regresionu analizu na poduzorku žena u VTO procesu, kao mogući prediktori skorova na FertiQol. Uzorak ispitanika čini 163 žena koje se trenutno nalaze u postupku vantelesne oplodnje (M godina 35,58; SD=5.04) i 129 žena koje su dobile bar jedno dete bez poteškoća sa začecem (M godina 34,37; SD=4.92). Ispitanice u procesu VTO popunile su Ferti-Qol (kvalitet života kod problema sa plodnošću); a na oba poduzorka zadati su i PANAS (pozitivna i negativna emocionalnost), OAS (stid pred drugima), CCQ (prevladavanje/rezilijentnost), MSPSS (opažena socijalna podrška) i RSES (samopoštovanje). Rezultati pokazuju da se kod žena u toku VTO procesa izraženost svih FertiQol skorova značajno razlikuje, pri čemu su vrednosti najniže na subskali Duh i telo, koja se odnosi na efekat problema sa sterilitetom na fizičko zdravlje, kognicije i ponašanje (M=48.12; SD=18.84) i subskali Emocionalnost, koja se odnosi na efekat emocija na kvalitet života (M=50.10; SD=18.29). Nađene su značajne razlike u izraženosti skorova na PANAS subskali Negativne emocionalnosti ( $t=4,17$ ;  $p<.001$ ) i skorova na skali OAS, Stid pred drugima ( $t=2,09$ ;  $p<.05$ ), koji su viši kod žena u VTO procesu. Iz rezultata regresione analize izdvojicemo sledeće: značajni prediktori skorova na subskali Duh i telo su Pozitivna emocionalnost ( $\beta=.201$ ,  $t=2.55$ ,  $p<.05$ ), Negativna emocionalnost ( $\beta=-.382$ ,  $t=-4.62$ ,  $p<.001$ ) i Samopoštovanje ( $\beta=-.158$ ,  $t=-2.40$ ,  $p<.05$ ). Značajni prediktori skorova na subskali Emocionalnost su, pored subskale Negativna emocionalnost, i skorovi na Skali prevladavanja CCQ ( $\beta=-.304$ ,  $t=-3.65$ ,  $p<.001$ ), kao i Samopoštovanje ( $\beta=-.147$ ,  $t=-2.37$ ,  $p<.05$ ). Smatramo da dobijeni rezultati ukazuju na neophodnost psihološke podrške ženama u toku VTO procesa u cilju očuvanja kvaliteta života. Rezultati ujedno ukazuju i na neke aspekte na koje treba obratiti pažnju prilikom savetovanja. Nadamo se da će ovakva istraživanja dovesti i do uvođenja psihološke podrške kao integralnog dela VTO procesa na klinikama.

*Ključne reči:* sterilitet, vantelesna oplodnja, kvalitet života, FertiQol, psihološko savetovanje

## The quality of life of women undergoing in vitro fertilization

Infertility is a phenomenon whose medical, psychological and socio-cultural aspects are inseparable. In modern-day clinical treatments, it is approached individually and holistically, while in Serbia treatment is still almost completely focused on the medical aspects. The aim of the present study is to provide data on the quality of life of women undergoing in vitro fertilization, which, along with insemination, is still the only process of assisted reproduction in this country. For the participants undergoing IVF we used a scale designed to study quality of life and infertility, while the control sample were given a series of questionnaires which refer to a sense of well-being, rendering comparisons between these two groups

possible. These additional questionnaires were used for the regression analysis on the sub-sample of women undergoing IVF, as the possible predictors of scores on the FertiQol. The sample consisted of 163 women who are currently undergoing IVF (M age 35,58; SD=5.04) and 129 women who had at least one child without experiencing difficulty conceiving (M age 34,37; SD=4.92). The participants undergoing IVF filled out the FertiQol (fertility quality of life questionnaire); and both of the sub-samples also completed the PANAS (positive and negative emotions), OAS (others as shamers), CCQ (coping competence questionnaire), MSPSS (multidimensional scale of perceived social support) and RSES (self-esteem scale). The results indicate significant differences in the values of all the FertiQol scores among women undergoing the IVF process. They are the lowest on the Mind-body subscale, which refers to the effects of infertility on physical health, cognition and behavior (M=48.12; SD=18.84) and the Emotional subscale, which refers to the effects of emotions on the quality of life (M=50.10; SD=18.29). Significant differences were determined between the values of the scores on the PANAS subscale of negative emotions ( $t=4,17$ ;  $p<.001$ ) and the scores on the OAS scale, ( $t=2,09$ ;  $p<.05$ ), which are higher among women undergoing the IVF process. The results of the regression analysis indicate the following: the significant predictors of the scores on the Mind-body subscale are Positive emotions ( $\beta=.201$ ,  $t=2.55$ ,  $p<.05$ ), Negative emotions ( $\beta=-.382$ ,  $t=-4.62$ ,  $p<.001$ ) and Self-esteem ( $\beta=-.158$ ,  $t=-2.40$ ,  $p<.05$ ). Significant predictors of the scores on the Emotional subscale are, in addition to the subscale Negative emotions, also scores on the CCQ scale ( $\beta=-.304$ ,  $t=-3.65$ ,  $p<.001$ ), as well as Self-esteem ( $\beta=-.147$ ,  $t=-2.37$ ,  $p<.05$ ). We believe that the results indicate the necessity of psychological support for women during the IVF process with the aim of preserving quality of life. They also indicate some aspects to which attention should be paid during counselling. We hope that these studies will also lead to the inclusion of psychological support as an integral part of the IVF process in clinics.

*Keywords: infertility, in vitro fertilization, quality of life, FertiQol, psychological counselling*

Melinda Schaap<sup>a</sup>, Karla Van Leeuwen<sup>a</sup>, Petra Warreyn<sup>b</sup>, Ilse Noens<sup>a</sup>

<sup>a</sup>KU Leuven, Belgium

<sup>b</sup>Ugent, Belgium

Email: [melinda.schaap@kuleuven.be](mailto:melinda.schaap@kuleuven.be)

## Parenting behaviour among mothers of infants at high risk for autism spectrum disorder

**Introduction:** The importance of early environmental experiences, such as parenting behaviour, is now more and more acknowledged in research on emergent autism spectrum disorder (ASD). Observation of parent-child interaction is a key method to assess parenting behaviour, but no “gold standard” exists when it comes to which constructs should be studied and how they should be operationalised. A clear conceptual framework is thus needed to compare research findings and to inform theory and practice, since parenting assessment outcomes are needed for and used in the development and testing of theories, and in the design of interventions.

**Aims:** Our first aim was to provide a conceptual framework of parenting young children with or at risk for ASD. Our second aim was to develop a coding scheme to assess parenting behaviour among mothers of infants and toddlers at high risk for ASD within the Tracking Infants At Risk for Autism (TIARA) study, a collaboration between KU Leuven, Ghent University, and societal partners (Flanders, Belgium).

**Method:** Database search yielded 21 papers that investigated parenting of young children below 4 years of age with or at risk for ASD, using observation. Papers were synthesised narratively, and parenting constructs investigated in these papers were classified under 9 overarching parenting categories through a comprehensive consensus decision-making process. Results from our systematic review, results from a self-report questionnaire study (Parenting Behaviour Scale; Van Leeuwen, Rousseau, Hoppenbrouwers, Wiersema, & Desoete, 2011), and the recently developed Parent-Infant Coding of Interaction (PiNTCI) formed the basis of our coding scheme.

**Results:** The 21 reviewed papers included 13 unique “coding approaches” and 63 parenting constructs. Despite the large heterogeneity in constructs and the lack of uniformity in descriptions, 9 overarching categories of parenting behaviour could be identified: Warmth, Responsiveness, Scaffolding, Proactive Control, Intrusiveness, Negativity, Dyadic, Other, and Multiple. The Coding Parenting of Infants and Toddlers (CoPIT) includes 14 parenting scales, and was developed based on the first 5 scales from our review, together with the PiNTCI scales

Sensitive Responsiveness, Scaffolding, Negative Control, Positive Affect; and the PBS scales Warmth/Support, Rules/Structure, Discipline.

Discussion: The results of our systematic review suggest heterogeneity of parenting constructs and a lack of uniformity in construct definitions in current research, but also demonstrate that common core concepts exist. These results formed the basis for the CoPIT, that bridges the gap between parent-child interaction and parenting constructs, by combining scales from both frameworks. The CoPIT will be used to investigate parenting behaviour among mothers of infants and toddlers at high risk for ASD within the TIARA study. Implications for research and clinical practice will be discussed.

Keywords: parenting behaviour, parent-child interaction, ASD, review, observation

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**Bratislava Stojković**

*Centar za socijalni rad opštine Aleksinac*

*Email: [b.stojkovic@hotmail.com](mailto:b.stojkovic@hotmail.com)*

## Kvalitet života porodica sa detetom sa smetnjama u razvoju u sistemu socijalne zaštite

Porodica predstavlja osnovni izvor podrške detetu sa smetnjama u razvoju. Članovi porodice preuzimaju povećane zahteve za negom, vremenom, emocionalnim i finansijskim resursima, koji se javljaju kada se podiže dete sa smetnjama (Baker-Ericzen, Brookman-Frazee & Stahmer, 2005).

Biti roditelj deteta sa smetnjama u razvoju često se opisuje kao značajno zahtevnije od roditeljstva dece tipičnog razvoja, samim tim što je opterećeno činocima kao što su specifične potrebe deteta i pojačani zahtevi u vezi sa dodatnom podrškom. Činjenica je da podizanje deteta sa razvojnim smetnjama predstavlja ozbiljan izazov za porodicu i zahteva pojačanu brigu o detetu u mnogim aspektima.

Istraživanja pokazuju da su deca sa smetnjama u razvoju u riziku za manji kvalitet brige u svojim porodicama. Izazovi koje nameće roditeljstvo u porodicama dece sa smetnjama u razvoju, kontinuirano brojniji i složeniji i imaju značajnog uticaja na kvalitet života porodica.

Iako kvalitet života može biti objašnjen na mnogo načina, najčešće se definiše kao individualan doživljaj zadovoljstva svim aspektima života, odnosno percepcija sopstvenog blagostanja i zadovoljstva životom, uključujući fizičko, socijalno,



ekonomsko i psihološko blagostanje, kao i osećaj pozitivne društvene uključenosti i mogućnosti ostvarivanja sopstvenih potencijala). Kvalitet porodičnog života prevazilazi potrebe člana sa smetnjama, sadrži u sebi potrebe svih članova porodice, kao i jake strane funkcionisanja porodične zajednice

Cilj rada predstavlja uspostavljanje usluga socijalne zaštite u zajednici u kojoj porodice sa detetom sa smetnjama žive i praćenje promena koje dovode do poboljšanja kvaliteta života. Rezultati predstavljaju prikaz petogodišnjeg pružanja usluga za 116 porodica deteta sa smetnjama u razvoju, od informisanja, edukacije, savetovanja, do standardizovanih usluga socijalne zaštite.

U praktičnom smislu, dok je unapređenje kvaliteta života deteta sa razvojnom smetnjom ishod kojem se teži u individualnom radu sa decom, kvalitet porodičnog života je pokazatelj ishoda i uticaja usluga usmerenih na porodicu. Na osnovu praćenja promena kvaliteta porodičnog života i njegovog poboljšanja, moguće je uporediti efekte različitih usluga.

Teorijski značaj rezultata do kojih se došlo se ogleda u ulozi i mestu koje usluge imaju u procesu poboljšavanja, odnosno pospešivanja sveukupnog kvaliteta života porodica sa detetom sa smetnjama u razvoju i načinu na koji se to postiže. Poseban praktičan značaj predstavljaju saznanja o proceni potreba porodica deteta za smetnjama u razvoju, njihovom aktivnom učešću, kao i planiranju uspostavljanja usluga socijalne zaštite u skladu sa potrebama porodice.

*Ključne reči:* Porodica, deca sa smetnjama, kvalitet života

## Quality of life of families with children with disabilities in development in the social welfare system

Family is the main source of support to children that are delayed in development. The members of the family have increased request for care, time, emotional and financial resources which exist in bringing up a child that is delayed in development (Baker-Ericzen, Brookman-Fraze & Stahmer, 2005).

Being a parent of a child that is delayed in development is often described as more demanding than of children with typical development, because it is loaded with the factors of specific needs of the child and increased requests connected to additional support. It is a fact that bringing up a child with developmental delays is a true challenge for the family and demands increased care for the child in various aspects.

Research shows that children who are delayed in development are at risk to receive less quality care within their families. The challenges posed by parenting in



families of children with developmental disabilities are continuously increasing and complex and have a significant impact on the quality of life of families.

Although life quality could be explained in many ways, it is defined most frequently as individual experience of pleasure towards all aspects of life, in fact, it is a perception of individual well-being and pleasure of life, including physical, social, economic and psychological well-being as well as the feeling of positive social inclusion and possibilities of fulfilling potentials one has. The quality of family life exceeds the needs of the member that is delayed in development, contains in itself the needs of all the members of the family as well as the strong sides of the family community functioning.

The aim of the work is to establish social protection services in the community in which families with children with disabilities live, as well as to monitor changes that lead to an improvement in the quality of life. The results are a snapshot of a five-year service delivery for 116 families, from information, education, counseling, to standardized social care services.

In practical sense, while the improvement of the life quality of a child who is delayed in development is an outcome to which individual work with the child aims, the quality of family life is an indicator of the results and the influences of the services directed to the family. Based on the family life quality tracking and its improvement, it is practically possible to compare effects of different services.

The theoretical significance of the results obtained is reflected in the role and place that services play in the process of improving or enhancing the overall quality of life of families with a child with developmental disabilities and how this is achieved. Of particular practical importance are the findings on the assessment of the needs of families of children with disabilities, their active participation, as well as the planning of establishing social care services in accordance with the needs of the family.

**Keywords:** Family, children with developmental delays, life quality

Vesna Šeper, Nebojša Nešić

College of Applied Sciences "Lavoslav Ružička" Vukovar, Croatia

Email: vesna.seper@vevu.hr

## Stavovi studenata fizioterapije prema deci s posebnim potrebama

Uvod: Deca s posebnim potrebama su ona koja imaju, ili su u povećanom riziku za nastanak hroničnih telesnih, razvojnih, emocionalnih, ili stanja vezanih uz ponašanje, te ona koja zahtevaju zdravstvene i druge usluge u količini i vrsti koju deca tipičnog razvoja inače ne zahtevaju. Pozitivni stavovi prema deci s posebnim potrebama rezultiraju davanjem jednakih prilika za uključivanje u sve aspekte života, u čemu važnu ulogu imaju i zdravstveni radnici. Opšti cilj: utvrditi stavove studenata fizioterapije prema deci s posebnim potrebama. Specifičan cilj: utvrditi da li postoje razlike u tim stavovima ovisno o spolu, dobi, završenoj srednjoj školi, mestu stanovanja, broju braće i sestara, obrazovanju roditelja i imovinskom stanju porodice. Metode i materijali: istraživanje za ovaj rad provedeno je na Veleučilištu „Lavoslav Ružička“ u Vukovaru tokom akademske godine 2016./2017. U istraživanju je ukupno sudelovalo 93 studenta fizioterapije prve i treće godine studija koji su se dobrovoljno javili. Studenti su trebali popuniti upitnik s 12 tvrdnji o stavovima prema deci s posebnim potrebama, koji je sastavljen samo za potrebe ovog istraživanja. Odgovori su ponuđeni u vidu petostepenske Likertove skale. Statistička je obrada podataka urađena na IBM SPSS Statistics programu, verziji 23. Za utvrđivanje razlika u odgovorima po spolu i mestu stanovanja korišten je Mann – Whitney U test, a za razlike u odgovorima prema ostalim socio-demografskim obeležjima (dob, završena srednja škola, stručna sprema majke i oca, broj braće i sestara, imovinsko stanje porodice) korišten je Kruskal – Wallis test. Statistička je značajnost utvrđena na nivou  $p \leq 0.05$ . Rezultati: U istraživanju je sudelovalo više žena (56) nego muškaraca (37), starosti  $22.7 \pm 4$  godine. Najveći broj ih je završio gimnaziju (42%) i medicinsku školu (34%). Odgovori koje su dali statistički se značajno razlikuju u kategoriji spol (tvrdnja 7  $p=0.05$ ; tvrdnja 8  $p=0.03$ , i tvrdnja 12  $p \leq 0.05$ ), broj braće i sestara (tvrdnja 8  $p \leq 0.05$ ) i imovinsko stanje (tvrdnja 11  $p=0.05$ ). Zaključak: u ovom su istraživanju razlike u stavovima prema deci s posebnim potrebama utvrđene ovisno o spolu, broju braće i sestara, te socioekonomskom statusu porodice.

**Ključne reči:** stavovi; deca s posebnim potrebama; studenti fizioterapije

## Attitudes of physiotherapy students toward children with special needs

**Background:** Children with special needs are children that have or are at risk of developing physical, neurological, emotional or behavioral conditions, or need special health services and other services in such amount and manner that typical developing children usually do not need. Positive attitudes toward children with special needs will result in giving them equal opportunities to integrate in all aspects of life. Healthcare professionals have important role in creating attitudes toward children with special needs. **Purpose:** The aim of this research was to determine attitudes of first and final year of physiotherapy students and if those attitudes differ regarding sex, age, dwelling, number of siblings, finished secondary school, education of parents and family income. **Materials and Methods:** This cross-sectional research was done at College of Applied Sciences „Lavoslav Ružička“ in Vukovar during academic year 2016/2017. Ninety three freshman and final year physiotherapy students voluntarily participated. They were asked to fill out a questionnaire containing 12 statements about children with special needs, specially designed for this research. Answers were given on a five-level Likert scale. SPSS Statistics version 23 was used for data analysis. Mann – Whitney U test was used to determine differences based on sex and dwelling and for the rest of the variables Kruskal-Wallis test. Statistical significance was set at  $p \leq 0.05$  level. **Results:** more women (56) than men participated (37), mean age  $22.7 \pm 4$ . Most of them finished gymnasium (42%) and secondary school for nurses (34%). Statistical significant differences regarding sex were found for statements 7 - Children with special needs have the same rights as typical developing children ( $p=0.05$ ); 8 - Children with special needs can have same hobbies as typical developing children ( $p=0.03$ ); and 12 - Children with special needs usually trigger feelings of sorrow ( $p \leq 0.05$ ). Significant differences regarding number of siblings were found for statement 8 ( $p \leq 0.05$ ) and regarding family income for statement 11 – After graduating Physiotherapy I am competent enough to work with children with special needs ( $p=0.05$ ). **Conclusion:** attitudes toward children with special needs may differ regarding sex, number of siblings and family income.

**Keywords:** attitudes; children with special needs; physiotherapy students



SOCIJALNA PSIHOLOGIJA

SOCIAL PSYCHOLOGY

Ivana M. Jakšić<sup>a</sup>, Katarina Mijatović<sup>a</sup>, Tamara Džamonja Ignjatović<sup>b</sup>

<sup>a</sup>*Faculty of political sciences, University of Belgrade, Serbia*

<sup>b</sup>*Faculty of political sciences, University of Belgrade, Serbia; Faculty of philosophy, University of Belgrade, Serbia*

*Email: ivanamjaksic@gmail.com*

## Perceived and actual gender discrimination: Effects on personal self-esteem and coping styles

Although women continue to face different forms of discrimination in all domains of life, their perceptions of gender discrimination do not necessarily reflect the objective circumstances. Women, as well as the other members of non-privileged groups, tend to minimize the discrimination they personally face in comparison to discrimination their social group faces. These perceptions tend to have differential effects on important outcomes: while perceived personal discrimination negatively affects emotional well being, acknowledging group discrimination promotes affirmative action and delegitimization of the status quo. Motivational and cognitive explanations have been offered to account for these findings. The aim of this research was to explore personal/group discrimination perception discrepancy and its relation to actual gender discrimination, as well as their differential effects on personal self-esteem and discrimination coping styles. Convenience sample of 273 women from all parts of Serbia, of various ages (19-62,  $M=37.4$ ) and SES completed e-survey. Perceived personal ( $\alpha=.81$ ) and group discrimination ( $\alpha=.85$ ) were assessed with the set of items typically used for this purpose in previous studies, actual discrimination in different domains of life was determined with modified Schedule of Sexist Events (SES-LM, Klonoff & Landrine, 1995), Rosenberg's scale was used for measuring personal self-esteem ( $\alpha=.84$ ), while coping styles (withdrawal and action) were assessed with modified Coping with discrimination check list (Mc Neilly et al., 1996). We observed personal/group perceived gender discrimination discrepancy: women perceived group discrimination to be higher than personal discrimination ( $t(1,205)=16.13$ ). Using hierarchical multiple regression we found that measures of actual discrimination in domains of upbringing, education, work and partner relationships explained 36% of variance in perceptions of personal discrimination and 17% in perceptions of group discrimination. In both cases, measures of discrimination in education and work were the strongest predictors. Perceived personal discrimination explained 2% of variance in personal self-esteem above actual discrimination (4%), while perceived group discrimination had no contribution. Withdrawal coping style could only be predicted by actual discrimination during upbringing and education (6% of

variance), while personal self-esteem was the only variable predicting active coping style (6%). Our findings provide novel confirmation of the motivational hypothesis in explaining personal/group discrimination perception discrepancy, according to which women minimize personal experiences of discrimination in order to maintain positive feelings towards themselves. Our findings demonstrate that when reporting on perceived personal discrimination women tend to disregard discrimination in domains of life with stronger ties to emotional self (upbringing and partner relationships vs. education and work).

**Keywords:** gender discrimination, personal/group discrimination perception discrepancy, self-esteem, discrimination coping styles

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Ivana Burić, Milica Milosavljević, Stevan Nikolić

*Faculty of Philosophy, Department of Psychology, Laboratory of Experimental Psychology, Novi Sad*

*Email: stevanbet365@gmail.com*

## Relation between Attitudes toward Homosexuality and Religiousness

The aim of this research was to examine whether there is a statistically significant correlation between Religiousness and Attitude toward Homosexuality; whether there is difference in attitude toward homosexuality depending on the level of parents' education; as well as to examine whether score on the dimension Attitude toward Homosexuality could be presupposed based on dimension Religiousness. Meta analysis conducted by Bernard Whitley (Whitley, 2009) shows that religiousness in general can be associated with negative attitude toward LGBT population. Based on the other researches, our initial assumption was that people with higher score on Religiosity questionnaire will have more negative attitude toward LGBT population. Also, there is assumption that people who were raised by higher educated parents will have more liberal standpoint (Farnworth, Longmire, West, 1998, according to Kozolski, 2010). According to the research (Roi & Mandemakers, 2017), parents' education indirectly, through effect on child's education, influence child's attitude toward LGBT population. The sample was suitable and included 333 people (M = 146, F = 187) between the ages of 18 and 45 (M = 21,47; SD = 2,76). Instruments that were used in the research were: Religiosity questionnaire (RO-3; Ljubotina, 2002) and Attitudes toward Homosexuality Scale (ATHS; Falomir-Pichastor & Mugny, 2009). The results showed a statistically

significant mean negative correlation between Attitude toward Homosexuality and dimension Religious Beliefs ( $r = -0.40$ ,  $p < .01$ ), Dimension Of Ritual Religiosity ( $r = -0.36$ ,  $p < .01$ ) and dimension Consequences Of Religiosity On Social Behavior ( $r = -0.54$ ,  $p < .01$ ). There are statistically significant differences in Attitude toward Homosexuality between groups that originate from the families in which parents have different levels of education. More positive attitude have the people whose fathers have higher education ( $t = -2.425$ ;  $df = 331$ ,  $p < .05$ ), as well as the people whose mothers have higher education ( $t = -2.844$ ,  $df = 331$ ,  $p < .05$ ). Regression analysis shows that Attitude toward Homosexuality can be statistically significant predicted based on the all three subdimensions of religiousness ( $R^2 = 0.294$ ;  $F(3, 329) = 45.62$ ;  $p = .000$ ), and Consequences Of Religiosity On Social Behavior is statistically significant predictor ( $\beta = .041$ ,  $p < .01$ ), while dimensions Religious Beliefs ( $\beta = .012$ ,  $p > .01$ ) and Dimension Of Ritual Religiosity ( $\beta = .041$ ,  $p > .01$ ) didn't separate as individual and statistically significant predictors. So, to conclude, the people who see themselves as religious have more negative view of homosexual people. On the other hand, the people whose parents have higher level of education have more positive attitude toward homosexual people. This research shows how our religiousness affects our view and attitude toward homosexuality. It also shows how parents can have influence on someone's attitude toward homosexual people.

**Keywords:** Religiousness, Attitudes toward Homosexuality, Education

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Duško Kljajić, Jasna Milošević

*Faculty of Media and Communications, Singidunum University*

*Email: [dusko.kljajic.20160670@fmk.edu.rs](mailto:dusko.kljajic.20160670@fmk.edu.rs)*

## Exploring HPV vaccine knowledge in Serbia

The Human Papillomavirus infection prevention vaccine (HPV vaccine) has been increasingly coming to focus, as HPV is the leading cause of several kinds of cancer. Immunization rates throughout the world are very low, especially in the male population, seeing as complications from HPV are extremely rare for men. Although vaccine knowledge has been proven not to be enough to ensure a positive attitude towards vaccination, it is a necessary condition. Therefore it is of great importance to investigate the factors behind HPV knowledge.

Drawing from a nationally representative sample of adult Serbian population from May year 2018 (N=1480), we investigated: a) the level of HPV knowledge in Serbia;



b) differences in health attitudes and vaccine behavior of those who are (not) aware of HPV; c) the predicting ability of socio-demographic and psychological predictors of HPV knowledge

In the study we included standard set of socio-demographic variables, media literacy, trust in the medical system, medical conspiracy and conspiracy mentality as predictors of HPV knowledge.

We hypothesized low level of HPV knowledge in Serbia (H1), statistical differences in medical attitudes towards health and behavior of those (not) aware of HPV (H2), and psychological variables as better predictors than socio-demographic in predicting HPV awareness(H3).

The results of our study confirm a) the low rates of general knowledge about vaccines and specific HPV awareness: only 34% of adult population knew what the HPV vaccine was;. b) We found significant differences in media literacy between those who knew about HPV and those who did not:  $t(1219) = 3.87, p = .00$  (MD = 1.50), as well as vaccination behavior  $t(1012.986) = 2.68, p < .01$  (MD = 0.13), and medical conspiracy  $t(792.749) = -2.85, p < .01$  (MD = -1.13). There were no significant differences between the two groups in trust in the medical system or conspiracy mentality. Significant differences were also found in socio-demographic variables: age  $t(1215.93) = -2.23, p < .05$  (MD = -1.84); education  $t(1069.870) = 7.91, p = .00$  (MD = 1.15). c) A combined model of both psychological and socio-demographic variables only explained 4% of the variance in HPV knowledge.

The level of knowledge on HPV and vaccination in general is, per our hypothesis low. Our second hypothesis has also been confirmed: our results suggest that the more educated and media savvy are more likely to be informed about HPV. Taking the better education and access to information into account, it isn't surprising that the younger population knows more than the older, nor is the greater willingness to vaccinate amongst people who are better informed about HPV. The low predictive ability of measured variables suggests the importance of context in gaining knowledge, besides individual characteristics. Although general education and media literacy are important, they are not enough to ensure reliable information in specific fields, such as HPV vaccination.

**Keywords:** HPV vaccine knowledge, immunization, Serbia

Jasmina Mehulić, Željka Kamenov

Sveučilište u Zagrebu, Filozofski fakultet, Odsjek za psihologiju

Email: [jmehulic@ffzg.hr](mailto:jmehulic@ffzg.hr)

## Otac na roditeljskom/roditeljskom dopustu - rodne uloge, stavovi i namjera korištenja

Premda prema Zakonu o roditeljskim i roditeljskim potporama, očevi imaju pravo korištenja roditeljskog i roditeljskog dopusta već nakon sedamdesetog dana od rođenja djeteta, u Hrvatskoj to pravo koristi tek 2% očeva. Zakon Republike Hrvatske u skladu je s preporukama Vijeća Europe o poticanju očeva na korištenje dopusta u svrhu osiguranja ravnoteže između poslovnog i privatnog života oba roditelja i skrbnika. Također, dualnim korištenjem dopusta potiču se i ravnopravna podjela roditeljskih uloga kao i suzbijanje rodne diskriminacije na tržištu rada.

S ciljem utvrđivanja i provjere odrednica stavova muškaraca i žena o očevom korištenju roditeljskog i roditeljskog dopusta, te provjere mogućnosti predviđanja korištenja dopusta na temelju stava o korištenju dopusta, provedeno je online istraživanje koristeći kvotno uzorkovanje ( $N = 539$ ; 53.1% žena;  $M_{dob} = 42$  godine,  $SD_{dob} = 17.79$ ). Za potrebe istraživanja konstruirana je Likertova Skala stavova o očevom korištenju roditeljskog i roditeljskog dopusta koja je sadržavala 24 čestice te su u analizama korištene i dimenzije ekspresivnosti i instrumentalnosti Skale rodni uloga (PAQ, Spence, Helmreich i Stapp, 1975) i Skala stavova prema rodni ulogama (Kamenov, Jelić i Jugović, 2009). Skala stavova o očevom korištenju roditeljskog i roditeljskog dopusta bila je visoko pouzdana (Cronbachov  $\alpha = .94$ ) te su sudionici iskazali umjereno pozitivan stav prema očevom korištenju roditeljskog i roditeljskog dopusta. Od sociodemografskih karakteristika uvrštenih u regresijsku analizu ( $R^2 = .26$ ,  $SE = 15.17$ ,  $F(7,484) = 16.483$   $p < .05$ ), stav je bio određen jedino spolom ( $\beta = .19$ ,  $t = 4.470$ ,  $p < .05$ ), pri čemu žene, u odnosu na muškarce, iskazuju značajno pozitivniji stav o očevom dopustu ( $M_{žene} = 2.86$ ,  $SD = 0.44$ ;  $M_{muškarci} = 2.59$ ,  $SD = 0.52$ ;  $t(469) = -6.280$ ,  $p < .05$ ). I među muškarcima i među ženama, ekspresivnost ( $\beta = .32$ ,  $t = 7.57$ ,  $p < .05$ ) i stav prema rodni ulogama ( $\beta = .26$ ,  $t = 6.41$ ,  $p < .05$ ) bili su značajno i direktno povezani sa stavom o očevom dopustu, a posredno - putem stava prema očevom dopustu - i s namjerom korištenja roditeljskog ili roditeljskog dopusta kod muškaraca ( $b = .08$ ,  $p < .05$ ,  $OR = 1.083$  (95% CI: 1.052 – 1.115)), te namjerom traženja partnera da koristi roditeljski ili roditeljski dopust kod žena ( $b = .08$ ,  $p < .05$ ,  $OR = 1.086$  (95% CI: 1.036 – 1.138)). Rezultati ovog istraživanja ukazuju na važnost stava kao jedne od odrednica namjere korištenja očevog dopusta, ali i upućuju na potrebu za identifikacijom kako ostalih potencijalnih odrednica stava, tako i namjere očevog korištenja dopusta.

**Ključne reči:** stav, ocev dopust, roditeljski i roditeljski dopust, rodne uloge

## Fathers taking parental leave – gender roles, attitudes and intention to use

Although according to the Croatian law, both parents have the right to take paid parental leave as early as seventy days after the child is born, in Croatia only 2% of fathers take any parental leave. Croatian law corresponds with the recommendations put forward by the European Council that aim to ensure a work-life balance for both the mother and the father. Dual use of parental leave also encourages a more equitable division of parental roles as well as battling gender-based discrimination in the labour market.

This study aimed to determine the attitude towards fathers using parental leave and its correlates among both men and women. Additionally, this study also sought to assess the relationship between the attitude towards and intent to use father's parental leave. An online questionnaire and quota sampling were used ( $N = 539$ ; 53.1% women;  $M_{\text{age}} = 42$  godine,  $SD_{\text{age}} = 17.79$ ). A Likert's scale of Attitudes towards father's use of parental leave was constructed and validated. It has 24 items and a high internal consistency reliability (Cronbach's  $\alpha = .94$ ). The main analysis assessed the relationship between the Attitudes towards father's use of parental leave and the Personal Attributes Questionnaire (PAQ, Spence, Helmreich, & Stapp, 1975), more specifically dimensions of expressivity and instrumentality, as well as the Attitudes towards Gender Roles Scale (Kamenov, Jelić, & Jugović, 2009). The results indicate moderately positive attitudes towards father's use of parental leave among both men and women. A multiple regression analysis was conducted ( $R^2 = .26$ ,  $SE = 15.17$ ,  $F(7,484) = 16.483$ ,  $p < .05$ ). Of the sociodemographic variables attitude is determined only by sex ( $\beta = .19$ ,  $t = 4.47$ ,  $p < .05$ ), with women expressing a somewhat more positive attitude than men towards fathers using parental leave ( $M_{\text{women}} = 2.86$ ,  $SD = .44$ ;  $M_{\text{men}} = 2.59$ ,  $SD = .52$ ;  $t(469) = -6.280$ ,  $p < .05$ ). Among both men and women, expressivity ( $\beta = .32$ ,  $t = 7.57$ ,  $p < .05$ ) and the attitude towards gender roles ( $\beta = .26$ ,  $t = 6.41$ ,  $p < .05$ ) were directly associated with the attitude towards fathers using parental leave, as well as indirectly - through attitudes towards fathers using parental leave - with the intention to use father's parental leave in men ( $b = .08$ ,  $p < .05$ ,  $OR = 1.083$  (95% CI: 1.052 – 1.115) and the intention to ask the father to use his parental leave in women, respectively ( $b = .08$ ,  $p < .05$ ,  $OR = 1.086$  (95% CI: 1.036 – 1.138). The results of this study indicate the importance of attitude as one of the determinants of intent to use father's parental leave, but also point to the need for further assessment of other potential determinants of attitude towards and intent to use fathers using parental leave.

**Keywords:** attitude, father's parental leave, parental leave, gender roles

Marija Branković

Faculty of media and communications, Singidunum University

Email: [marija.brankovic@fmk.edu.rs](mailto:marija.brankovic@fmk.edu.rs)

## Are vegetarians warm and competent? Contents and predictors of stereotypes about vegetarians

Food choices of an individual can affect other people's impressions of them. Whereas both historical examples and contemporary Internet contents abound in negative views of people abstaining from meat, more recent research suggests vegetarians are typically viewed as principled, somewhat weak and feminine. However, there is little research on the specific contents of stereotypes about this group in non-Western countries. In this study we therefore set out to establish stereotypes about vegetarians along warmth and competence dimensions, as well as whether these perceptions are related to social distance towards vegetarians. Also, we wanted to investigate possible predictors of stereotype positivity, namely, one's own frequency of meat consumption, general attitudes towards animals and animal exploitation, perceptions of vegetarianism as a threat to traditional worldviews as well as perceived moral superiority of vegetarians. We recruited a sample of 275 participants from Serbia for a survey study among students and via snowballing (from 18 to 56 years of age, 83% female). They rated the probability that vegetarians possess a list of positive and negative traits (from 0 to 100%), indicated their level of preferred social distance towards vegetarians ( $\alpha = .91$ ) and also their own frequency of meat consumption, attitudes towards animals ( $\alpha = .82$ ), whether they perceive vegetarianism as a threat to traditional worldviews ( $\alpha = .86$ ) and whether they felt they were seen as morally inferior by vegetarians ( $\alpha = .76$ ). Results suggest that vegetarian diet choices can lead to stereotyping, since all of the trait ratings were significantly above or below chance (50%). Stereotypes about vegetarians among the non-vegetarian majority of the sample proved quite positive in content, which can be related back to the characteristics of the sample (mostly well-educated and liberal). Ratings on warmth dimension ( $M = 67.31$ ,  $SD = 17.59$ ) were somewhat higher than on competence dimension ( $M = 63.87$ ,  $SD = 19.32$ ) ( $t(245) = 5.13$ ,  $p < .01$ ). Specifically, non-vegetarians rated vegetarians as civilized (69.35%), good (64.80%) and self-reliant (61.42%), as well as not violent (25.87%), abnormal (27.01%) or uneducated (27.37%). A hierarchical regression analysis revealed that, controlling for frequency of meat consumption, perception of vegetarianism threat ( $\beta = -.22$ ,  $p < .01$ ) and general attitude towards animals ( $\beta = .17$ ,  $p = .012$ ) predicted stereotype positivity ( $R^2 = .13$ ,  $p < .01$ ). In effect, stereotype positivity predicted less social distance toward close relations with vegetarians ( $r$

=.27,  $p < .01$ ). It appears that vegetarians are not necessarily perceived in negative terms personally. However, less positive impressions are to be found among people viewing them as subversive to the traditional worldviews as well as those with less favorable attitudes towards animals.

**Keywords:** stereotypes, vegetarians, vegetarianism threat, attitudes towards animals

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Ljiljana Gregov, Ana Proroković, Nataša Šimić, Andrea Tokić

*University of Zadar*

*Email: ljgregov@gmail.com*

## Cognitive reflection and reflexion in moral reasoning

Previous studies showed relations between results of the Cognitive Reflection Test (CRT) and utilitarian moral reasoning, but, there is not clear evidence does CRT results correlate with moral reasoning when it is measured by hypothetic scenarios (i.e. when there are no intuitive answers). The aim of this study was to test do people who prefer reflexive or reflective types of thinking (measured by CRT test) differ in moral reasoning when it's assessed by hypothetic scenarios. We assumed that people who prefer the reflexive way of thinking would have a higher result on Test of moral reasoning because this sort of thinking is related to preferences for higher engagement in complex cognitive tasks (and which corresponds to arguments related to Kohlberg's higher stages of moral development). In contrary, reflective types generally prefer a heuristic way of thinking so we assumed that persons who prefer this type of thinking would have lower results on Test of moral reasoning.

In this study participated 442 subjects (279 males, 163 females; age range 19 - 76 ( $M=34.52$ )). The task of subjects was to fill out online English versions of Moral reasoning test (Proroković, 2016) and expanded version of Cognitive Reflection Test (CRT) (Toplak, West, Stanovich, 2014). Two tests were applied through PsyToolkit software which collected the subject's answer and time needed to answer (response time). Based on CRT result two groups of participants are formed: reflexive type ( $n=211$ ; 5 of 7 correct answers) and reflective type ( $n=100$ ; minimum 4 of 7 intuitive answers).

The results showed that reflexive types had a higher level of moral reasoning (IMR) than reflective type ( $F(1,309)=4.94$ ;  $p=.027$ ). These two types also differed in the perception of relevance arguments that reflect the six Kohlberg's stages of moral

development ( $F(1,309)=19.30, p=.000$ ), the reflective types all six arguments assessed as more relevant than reflexive types. The relevance of arguments linearly rises with stage increment ( $F(5,305)=6.87, p=.009$ ), which is expected. For reflexive type this rise is linear, however, for reflective type, it seems that exists two categories of argument's relevancy, i.e. low relevant arguments (reflects first, second and fourth stages) and high relevant argument, which reflects third, fifth and sixth stages. These unusual results in the conventional stage are something specific related to the reflective group, i.e. they are driven by affect based on associations (social norms) rather than rules (laws).

Finally, it seems that cognitive reflection types are related to moral reasoning even than when moral reasoning is measured by the instrument which doesn't have the intuitive type of answers (like utilitarian dilemmas have).

**Keywords:** index of moral reasoning, reflexive, reflective, CRT, Kohlberg's moral stages

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**Alija Selimović**

*University of Tuzla*

*Email: [alija.student@gmail.com](mailto:alija.student@gmail.com)*

## Political identity and memory of civil protests in Federation of Bosnia and Herzegovina in 2014

In 2014 several Bosnian cities experienced large-scale anti-government protests

due to the citizens' dissatisfaction with the state's social situation Civil protests began in Tuzla in February. This paper examines the relationship between party identification and the memory of violent demonstrations of political activists from Tuzla that belonging to one of the two of the most important political parties: the Social-Democratic Party (SDP) and the Party of Democratic Action (SDA). The aim of the analysis is to examine whether there are differences in the perception of political activists about the causes of civil protests, as well as whether there are differences in recapturing the violent episodes from February, 2014. How does political participation influence past events, including violent episodes? In addition, as the SDP was the ruling party at the time of the protest, the goal is to determine whether there are any attributional biases in recalling key episodes of violent protests. The investigation is conducted on 60 male political activists from the Social-Democratic Party (SDP) and the Party of Democratic Action (SDA). The

parties' choice is made in accordance with the party's importance and their (in)direct link to the key events of 2014. Only respondents older than 30 years and politically active in their parties at the time of February protest are targeted in the sample. Interviews were conducted with all respondents. During interviews we gathered information about the causes of the protests, the perpetrators, the organizers, the real background of the events, as well as about the aggressors and the victims of the events. The basic hypothesis of the survey is based on the theory of social identity (Tajfel & Turner, 1986), which assumes that respondents will more positively evaluate members of their own group rather than members of an external group. The attributional biases are manipulated by using the error-choice test method (Hammond, 1948), by making the key events intentionally presented in a way that does not match the actual facts. The direction of deviation of the respondents was tested. The 24 key events were selected, and results shows that 74% of all responses favored their own political party. No differences were found between two groups of respondents according to the preferential rate  $t(58) = .54$ ,  $p < .67$ . According to the theory of social identity, the respondents of both parties followed the discounting principle and recalled less episodes that could be a threat to their political identity.

**Keywords:** political identity, social identity, attributional bias, memory

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**Safet Mušić**

*Ministarstvo odbrane BiH*

*Email: [musicsafet@yahoo.com](mailto:musicsafet@yahoo.com)*

## Migrantska situacija u Bosni i Hercegovini kroz prizmu socijalne psihologije i sigurnosti: izazovi i perspektive

Migrantska situacija u Bosni i Hercegovini s obzirom na njenu aktuelnost i kompleksnost, predmet je brojnih neslaganja, rasprava i nedorečenosti oko načina rješavanja trenutnog stanja. Međutim, složenost problematike iziskuje kontinuirano propitivanje, kao i dugoročnije sagledavanje situacije iz više uglova, u cilju adekvatnijeg djelovanja radi prevazilaženja evidentnih prepreka. Dostupni podaci ukazuju na izrazitu potrebu da se sa stanovišta socijalne psihologije, sagleda koncept migrantske situacije u kontekstu Bosne i Hercegovine, kao specifičnog tranzicijskog područja čiji su stanovnici i sami bili izbjeglice. Dodatno je potrebno obraditi i sigurnosni aspekt i to u oba smjera, migranti kao potencijalni sigurnosni izazov i migranti kao predmet kriminalizacije. S tim u vezi, istraživački rad ima za cilj



da istraži efekte i posljedice socijalizacije u kontekstu stavova, motiva ili ličnosti općenito, odnosno da sagleda uticaj koje sredina ostavlja na migrante i obostrano, s osobitom pažnjom na to kako kulturološke i društvene promjene utiču na ponašanje migranta i sigurnosnu situaciju.

Rezultati istraživanja će pokazati modele na koji način migranti kreiraju jedan (novi) socijalni kontekst i u kakvoj vezi je taj novi kontekst sa sredinom u kojoj se nalaze, odnosno bosanskohercegovačkim prostorom. Istovremeno, za potrebe rada analiziraće se i način izvještavanja elektronskih medija u BiH, kako bi predstavili medijsku sliku o migrantima, radi ukazivanja na važnost medija u kreiranju narativa o migrantima u našem društvu. Osim toga, autor će istraživanjem naglasiti i problematiku kriminalizacije migrantske situacije, u smislu različitih zloupotreba migranata u političke svrhe ili svrhe povećanja moći, te općeniti uticaj migrantske situacije na stabilnost i sigurnost Bosne i Hercegovine.

Osnovna hipoteza od koje se polazi jeste da migrantska situacija u Bosni i Hercegovini utiče na cjelokupnu socijalnu situaciju. S druge strane, specifičnost bosanskohercegovačkih prostora te (ne)adekvatno rješavanje migrantske situacije uvjetuje i promjene u samim ponašanjima migranta, te postavlja pitanje adekvatnog inkorporiranja migranata u novu sredinu. Rad će pratiti i istraživanje koje će se sprovesti s ciljem dobivanja relevantnih podataka sa terena, a realizovaće se metodom ispitivanja, odnosno anketiranja i intervjuisanja. Rezultati istraživanja i analiza trenutne migrantske situacije omogućiće predlaganje adekvatnih modela i preporuka za buduće djelovanje relevantnih aktera.

*Ključne reči:* migrantska situacija, koncept ličnosti, socijalna psihologija migrantske situacije, kriminalizacija migracija u Bosni i Hercegovini

## The migrant situation in Bosnia and Herzegovina through the prism of social psychology and security: challenges and perspectives

The migrant situation in Bosnia and Herzegovina in view of its actuality and complexity is the subject of numerous disagreements, debates, and inconsistencies about the way to resolve the current situation. However, the complexity of the problem requires continuous questioning, as well as a long-term view of the situation from multiple angles, with the aim of more adequate action in order to overcome evident obstacles. The available data point to the urgent need to look at the concept of a migrant situation in the context of Bosnia and Herzegovina, from a social psychology point of view, because Bosnia and Herzegovina is a specific transitional area whose inhabitants were refugees two decades ago. In addition, it is necessary to address the security aspect in both directions, migrants as a

potential security challenge and migrants as a subject of criminalization. According to this research paper, the aim is to investigate the effects and consequences of socialization in the context of attitudes, motives or personalities in general, but also to examine the impact which the environment leaves on migrants with particular attention to how cultural and social changes affect the behavior of migrants and security situation.

Furthermore, the research results will show models of how migrants create a (new) social context and in what relation is this new context with the environment in which they are located, that is the territory of Bosnia and Herzegovina. At the same time, the author will analyze the manner of reporting at electronic media in order to represent the image of migrants in media, and demonstrate the importance of media in creating narrative about migrants in our society. Therefore, with this research author will accent the issue of criminalization of migrant situation, regarding various misuses of migrants for political purposes or the purpose of empowerment of some political option, and the general impact of the migrant situation on the stability and security of Bosnia and Herzegovina.

The basic hypothesis is that the migrant situation in Bosnia and Herzegovina affects the overall social situation. On the other hand, the specificity of Bosnian-Herzegovinian territory and (in)adequate resolution of the migration situation also entail changes in the behavior of migrants and raises the question of the adequate incorporation of migrants into the new surroundings. For the purpose of this paper, the author will conduct research that will be carried out with the aim of obtaining relevant data from the field and will be carried out using the survey method and interview. The results of the research and analysis of the current migrant situation will enable the author to propose adequate models and recommendations for the future action of relevant actors.

**Keywords:** Migrant situation, the concept of personality, the social psychology of the migrant situation, criminalization of migration in Bosnia and Herzegovina

Aleksandra Huić<sup>a</sup>, Ivana Jeđud Borić<sup>b</sup>, Ana Širanović<sup>c</sup>

<sup>a</sup>University of Zagreb, Faculty of Humanities and Social Sciences, Department of Psychology

<sup>b</sup>University of Zagreb, Faculty of Education and Rehabilitation Sciences, Department of Social Pedagogy

<sup>c</sup>University of Zagreb, Faculty of Humanities and Social Sciences, Department of Pedagogy

Email: [ahuic@ffzg.hr](mailto:ahuic@ffzg.hr)

## Nurturance vs. Self-determination – what Croatian citizens believe about child rights

According to the UN Convention on the Rights of the Child (CRC), all children (persons under the age of 18) have the right to protection and survival, the right to optimal development and the right to express their opinions and participate in decisions which affect them. However, whether or not child rights will be implemented and how, depends primarily on adults. Therefore, the main goal of this study was to examine how adults in Croatia view children and their rights. This was part of a larger UNICEF Croatia project which investigates participation of children from vulnerable groups. Total of 1000 adult Croatians participated in the study (47.5% women; 64.1% high school graduates, 23.3% university graduates; from all Croatian regions, 55.2% employed; 58.3% married, 68.5% with children). The sample is representative for the adult Croatian population. We examined their perception of children (image of the child), and their attitudes towards and understanding of child rights. All the instruments were constructed for the purposes of this study and based on available questionnaires in the field and the CRC. Expectedly, results show children are viewed very positively. However, the image of the child is somewhat ambivalent – Croatian adults view children as active, cooperative and capable to express their opinion, they also view them as vulnerable and dependent. Overt support for different child rights based on the CRC was high, with support for nurturance rights ( $M=6.51$ ,  $SD=0.731$ ) being significantly higher ( $t = 34.84$ ,  $p<.0001$ ) than support for self-determination rights ( $M=5.67$ ,  $SD=0.924$ ). In addition, those who have children support nurturance rights ( $M=6.56$ ,  $SD=0.667$ ) more than those without children ( $M=6.41$ ,  $SD=0.849$ ) ( $t = 2.945$ ,  $p<.01$ ), but there were no significant differences in support of self-determination rights between those with or without children ( $t = 0.198$ ,  $p>.05$ ). When we examined attitudes towards child rights via modern prejudice (e.g. “children should stop complaining that they do not have enough rights”, “children today have too many rights, and too little responsibilities”, “children rights

threaten adult rights”)we observed high endorsement of modern prejudice ( $M=3.75$ ;  $SD=1.058$ ). In addition, those who harbor more modern prejudice also believe that adults should respect and support children rights less ( $r = -.44$ ,  $p<.001$ ), and support both nurturance ( $r = -.19$ ,  $p<.001$ ) and self-determination rights less ( $r = -.31$ ,  $p<.001$ ). They also have a more negative image of a child. They are more ready to believe children are disobedient ( $r = -.40$ ,  $p<.001$ ), boring ( $r = -.37$ ,  $p<.001$ ), vulnerable ( $r = -.06$ ,  $p<.05$ ), passive ( $r = -.33$ ,  $p<.001$ ) and less capable of self-determination and participation in decisions ( $r = -.09$ ,  $p<.01$ ). Overall, results indicate that important strides need to be made with adults and their attitudes towards child rights.

**Keywords:** child rights, nurturance rights, self-determination rights, image of the child, attitudes

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**Anesa Agović**

*Centar za društveno istraživanje Global Analitika*

*Email: [global.analitika@gmail.com](mailto:global.analitika@gmail.com)*

## Uticaj cyberbullinga na mentalno zdravlje maloljetnika

Zbog sve veće dostupnosti djece i mladih internetu i društvenim mrežama, koje se koriste potpuno nekontrolisano, sve je veći broj djece žrtava zlostavljanja putem interneta. Zlostavljanje počinje kao cyberbullying, ali nerijetko se zlostavljanje nastavi i van virtuelnog svijeta i preraste u teže oblike zlostavljanja. Takođe, zabrinjavajuća je činjenica da se međuvršnjačko nasilje sve češće dešava putem društvenih mreža ili komunikacije mobitelom.

O problemu zlostavljanja maloljetnika se govori i prepoznaje se, ali se problem sistemski ne rješava i često se zanemari činjenica povezanosti između nekažnjeno počinioaca nasilja na internetu sa budućim prekršiocem krivičnog zakona. Iz tog razloga nekažnjena zlostavljачka ponašanja se najčešće produbljuju.

Prema podacima iz više istraživanja u Bosni i Hercegovini, veliki broj maloljetnika trpi posljedice nasilja na internetu počinjenog od strane njihovih vršnjaka i razvijaju simptome na psihološkom planu. Djeca i mladi ne govore svojim roditeljima o nasilju na internetu kojem su izloženi, te često roditelji nisu ni upoznati na koji način njihova djeca provode svoje slobodne vrijeme na internetu.

Posljedice zlostavljanja na internetu utiču na ponašanju djece i mladih, a manifestuju se kroz agresivna, neurotična ili depresivna ponašanja. S tim u vezi u

okviru problema istraživanja, sam predmet istraživanja će se odnositi na to kakve posljedice cyberbullying ima na mentalno zdravlje maloljetnika. Zlostavljanje djeteta na internetu od strane vršnjaka u BiH ne prepoznaje se u dovoljnoj mjeri kao mogući rizik, ali ni kao prijeteća opasnost da se kod žrtve nasilja ozbiljno naruši mentalno zdravlje.

Za potrebe ovog rada realizovano je anketiranje roditelja i nastavnika u školama u Kantonu Sarajevo, a u kojima su zabilježeni slučajevi nasilja na internetu. Takođe, potrebno je analizirati i trenutnu zakonsku regulativu koja tretira zaštitu maloljetnika, te i na taj način razlučiti o sankcionisanju počinioca ovog nasilja, kao i navesti na razmišljanje o drugim preventivnim metodama.

Metode koje će biti korištene u ovom istraživanju su: analiza sadržaja, odnosno ankete i statistička metoda. Na taj način autor će doći do potrebnih podataka koji su aktuelni i mogu biti od značaja za buduća istraživanja, kojih na ovu temu inače nedostaje.

*Ključne reči:* Cyberbullying, Mladi, Maloljetnik, Prevencija, Internet

## The impact of cyberbullying on the minor's mental health

Due to the increasing availability of children and young people on the Internet and social networks, which are used completely uncontrollably, there is a growing number of children victims of abuse via the Internet. Abuse begins as cyberbullying, but infrequently abuse continues beyond the virtual world and develops into more serious forms of abuse. Also, it is concerning that peer violence is increasingly occurring through social networks or cell phone communications.

About the problem of juvenile abuse is being spoken and it is recognized, but the problem is not systematically resolved and the fact that there is a link between an unpunished perpetrator of online violence and a future criminal offender is often overlooked. For this reason, unpunished abusive behaviors tend to deepen.

According to data from various research in Bosnia and Herzegovina, a large number of minors suffer the effects of cyberbullying, that was conducted by their peers, thus develop psychological symptoms. Children and young people do not tell their parents about the online violence they are exposed to, and often parents are not even aware of how their children spend their free time online.

The consequences of online abuse affect the behavior of children and young people which are manifested through aggressive, neurotic or depressive behaviors. In this regard, within the scope of the research problem, the subject matter of the research will be concerned with the effects of cyberbullying on the

mental health of minors. Abuse of a child via the Internet by peers in BiH is not sufficiently recognized as a possible risk, nor as a threat to severely violate their mental health.

For the purpose of this paper, a survey of parents and teachers in schools in the Canton of Sarajevo was conducted, in which cases of violence via the Internet were recorded. Also, it is necessary to analyze the current legislation that deals with the protection of minors, and thus to discern the sanctioning of the perpetrators of such violence, as well as to reflect on other preventive methods.

The methods that will be used in this research are content analysis, i.e. surveys and statistical method. Therefore, the author will obtain the necessary data that is actual and may be relevant for future research, which otherwise is lacking on this topic.

**Keywords:** Cyberbullying, Youth, Minor, Internet, Prevention



PSIHOLOGIJA SPORTA

SPORT PSYCHOLOGY



Jovana Trbojević<sup>a</sup>, Jelica Petrović<sup>b</sup>

<sup>a</sup>*Matica srpska, Novi Sad*

<sup>b</sup>*Univerzitet u Novom Sadu, Filozofski fakultet, Odsek za psihologiju*

*Email: jovana.trbojevic88@gmail.com*

## Motivational climate as predictor of basic psychological needs in sports of young Serbian female athletes: the role of coach and teammates

In youth sports coach and teammates have relevant role in athlete's development as a player. They create motivational climate that can be task or ego-involving. The type of motivational climate directly influences behavior and values, but also the performance of an athlete. Recently, many studies turned to examining the role of motivational climate on the satisfaction of basic psychological needs in sports, with regard primarily on coach and parents. Having in mind that in adolescence, most important relationships in sports are the ones with peers – teammates and coach, this research examines predictive role of motivational climate created by coach and teammates on the satisfaction of basic psychological needs in sports; need for competence, autonomy, and relatedness. The sample consisted from 192 female young athletes, from collective sports, average age of 13.6 years from difference clubs on the territory of Vojvodina. During early spring time in 2017, they filled out Peer Motivational Climate in Youth Sport - MCYSQ (Ntoumanis & Vazou, 2005), Perceived Motivational Climate in Sport Questionnaire-2 - PMCSQ-2 (Newton, Duda & Yin, 2000), and the Basic Need Satisfaction in Sport Scale (BNSSS, Ng, Losdale, & Hodge, 2011). The predictive model consisted from factors: Task-involving motivational climate created by coach, Punishing mistakes by coach, Unequal treatment by coach, Task-involving motivational climate created by teammates, and Ego-involving motivational climate created by teammates, while criteria variables were need for Competence, Autonomy-Choice, and Relatedness. Results of regression analysis show that this model is statistically significant for all three psychological needs (Competence ( $F(5)=10.410$ ,  $p=.00$ ), Autonomy-Choice ( $F(5)=4.379$ ,  $p=.001$ ); and Relatedness ( $F(5)=20.497$ ,  $p=.000$ )) and that it explains 21.9% of variance for Competence, 10.5% for Autonomy-Choice; and 35.5% for Relatedness. For all three basic needs Task-involving motivational climate created by teammates singled out as significant predictor, but for Competence and Relatedness significant predictive role also has Task-involving motivational climate created by coach. Theoretical and practical implication of three results is discussed in the paper.

**Keywords:** motivational climate, youth sports, relationships with coach, teammates, basic needs in sports

Aleksandra Crvenko, Jelena Sokić, Stanislava Popov

Fakultet za sport i turizam - TIMS, Novi Sad

Email: [aleksandra.crvenko.f2618@s.tims.edu.rs](mailto:aleksandra.crvenko.f2618@s.tims.edu.rs)

## Značaj imaginacije u psihološkoj pripremi ženskog tima vaterpolo reprezentacije: Preliminarni nalazi

Ako analiziramo literaturu koja se bavi veštinama kojim se vrhunski sportisti koriste da bi postigli optimalno psihološko stanje za svoju izvedbu, zaključimo da su one mnogobrojne, a tema kompleksna. Savremena istraživanja ističu ulogu imaginativnih sposobnosti kao specifične mentalne veštine koja doprinosi unapređenju sportskog performansa, kao i postizanju boljih rezultata. U ovom radu bavili smo se vezom između specifičnih aspekata sposobnosti imaginacije i različitih psiholoških veština u ženskom timu vaterpolo reprezentacije. Cilj istraživanja je utvrđivanje zastupljenosti specifičnih imaginativnih sposobnosti vaterpolistkinja u kreiranju strategija, postavljanju ciljeva, suočavanju sa potencijalnim teškoćama, kao i opštijih psiholoških karakteristika važnih za sportsku izvedbu poput samopouzdanja, orijentacije na tim, koncentracije, itd., kao i utvrđivanje relacija među pomenutim konstruktima.

Istraživanje je sprovedeno na populaciji vaterpolistkinja (N=28), a podaci su prikupljeni u okviru dijagnostičkog postupka za potrebe psihološke pripreme ženske vaterpolo reprezentacije Srbije. Ispitivanje je obavljeno tokom priprema za evropsko prvenstvo 2018. godine. Za ove svrhe korišćeni su prevodi instrumenata na srpski jezik: Upitnik sposobnosti imaginacije u sportu (SIAQ: Williams & Cumming, 2014) i Upitnik psiholoških veština za sport - verzija za mlade (PSIS-Y: Elferik-Gemser, 2005).

Nakon izračunavanja standardizovanih vrednosti za skorove na supskalama korišćenih instrumenata, možemo zaključiti da je od imaginativnih sposobnosti u našoj vaterpolo reprezentaciji najzastupljenija imaginacija afekta povezanog sa sportskom izvedbom, a među opštim psihološkim veštinama samopouzdanje, odsustvo anksioznosti i motivacija za postignućem. Kada su u pitanju relacije između izmerenih psiholoških konstrukata, ukupna imaginativna sposobnost pozitivno korelira sa motivacijom za postignućem ( $r=.70$ ,  $p<.001$ ), koncentracijom ( $r=.64$ ,  $p<.001$ ) i mentalnom pripremljenošću ( $r=.58$ ,  $p<.001$ ). Posmatrajući svaku supdimenziju sposobnosti imaginacije posebno, sposobnost imaginacije cilja pozitivno korelira sa odsustvom anksioznosti ( $r=.64$ ,  $p<.001$ ), dok imaginacija strategije ( $r=.37$ ,  $p<.005$ ), cilja ( $r=.41$ ,  $p<.005$ ), i veštine izvođenja ( $r=.43$ ,  $p<.005$ ) pozitivno koreliraju sa samopouzdanjem.

Opšti zaključak koji možemo izvesti iz ovih rezultata jeste da razvijanje veština imaginacije ima značaja u opštoj psihološkoj pripremljenosti za vrhunsku sportsku izvedbu, dok pojedine specifične imaginacije, poput imaginacije cilja i strategije, promovišu sportsko samopouzdanje i redukciju anksioznosti.

*Ključne reči:* imaginacija, psihološka priprema, ženski vaterpolo tim, elitni sport

## The importance of imagery in psychological preparation of the national female water-polo team: Preliminary report

Analyzing the literature that deals with the skills which top athletes use to achieve the optimal psychological condition for their performance, one can conclude that they are numerous, and the subject is complex. Contemporary research emphasizes the role of imagery abilities as a specific mental skill that contributes to the improvement of sporting performance, as well as achieving better results. In this paper assessed the relationship between particular aspects of the ability of imagination and various psychological skills in the women's team of water-polo representation.

We aimed to examine the influence of the specific imagery abilities that water-polo female athletes use in creating strategies, setting up goals, facing potential difficulties, and more general psychological characteristics important for sports performance, such as self-confidence, team orientation, concentrations, etc.

The research was carried out on the population of 28 female water-polo athletes of the national team of Serbia, and the data were collected during the diagnostic procedure intended for designing the program of psychological preparation. The test was conducted during the preparations for 2018 European Championship. For these purposes, Serbian translations of the following instruments were used: The Sport Imagery Ability Questionnaire (SIAQ: Williams & Cumming, 2014) and Psychological Skills for Sport - Youth Version (PSIS-Y: Elferik-Gemser, 2005).

After calculating the standardized scores for each subscale, we found that the most represented imagery ability is the imagination of the affect, and among the general psychological skills self-confidence, absence of anxiety and motivation for achievement. When it comes to the relationships between measured psychological constructs, the overall imagery ability positively correlates with motivation for achievement ( $r = .70, p < .001$ ), concentration ( $r = .64, p < .001$ ) and mental preparedness ( $r = .58, p < .001$ ). Observing each subdimension of the ability of imagination in particular, the ability to visualize the goal positively correlates with the absence of anxiety ( $r = .64, p < .001$ ), while the visualization of the strategy ( $r = .37, p < .005$ ), the goal ( $r = .41, p < .005$ ), and performance skills ( $r = .43, p < .005$ ) positively correlate with self confidence.

The general conclusion we can draw from these results is that imagery is important in general psychological preparedness for elite sports performance, while certain specific imaginations, such as the imagination of the goal and the strategy, promote sports self-confidence and reduction of anxiety.

Keywords: imagery, psychological preparation, women's water-polo team, elite sport

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Sladana Grujić<sup>a</sup>, Jovana Trbojević<sup>b</sup>

<sup>a</sup>Fakultet za sport i turizam, Novi Sad

<sup>b</sup>Matica srpska, Novi Sad

Email: [jovana.trbojevic88@gmail.com](mailto:jovana.trbojevic88@gmail.com)

## Fizički self i opaženo ponašanje saigrača kao prediktori potrebe za kompetencijom kod mladih sportista

U skladu sa razvojnim promenama karakterističnih za adolescenciju, ovaj rad se bavi ispitivanjem relacija između načina na koji mladi sportisti percipiraju sopstvene fizičke sposobnosti i ponašanje saigrača i zadovoljene potrebe za kompetencijom. Potreba za kompetencijom predstavlja jednu od bazičnih univerzalnih potreba, koja dolazi do izražaja upravo tokom adolescencije. Mladi sportista ima potrebu da se oseća sposobnim, uspešnim u odabranoj aktivnosti i da ga drugi tako opažaju. Na doživljaj lične sportske kompetencije u velikoj meri utiče fizički self – predstava o sopstvenoj fizičkoj sposobnosti, ali i ponašanje saigrača. U okviru sporta, saigrači predstavljaju značajnu socijalnu vršnjačku grupu koja oblikuje vrednosti, ponašanje i identitet mladog sportiste.

Uzorak u ovom istraživanju sastojao se od 262 ispitanika (dečaka=131), prosečnog uzrasta od 13,7 godina koji se aktivno bave rukometom, odbojkom i košarkom minimum 3 godine, u klubovima sa teritorije Vojvodine. Tokom 2017/2018. godine oni su popunjavali Skalu fizičke samoefikasnosti (The Physical Self-Efficacy Scale, Ryckman et al., 1982) – subskalu percipirana fizička sposobnost i Upitnik opažene motivacione klime kreirane od strane saigrača (Peer Motivational Climate in Youth Sport – MCYSQ, Ntoumanis & Vazou, 2005) u okviru kojeg su izdvojene dve subskale: motivaciona klima usmerena na učenje i motivaciona klima usmerena na postignuće. Potreba za kompetencijom merena je subskalom Kompetencija iz Skale osnovnih psiholoških potreba u sportu (Basic Need Satisfaction in Sport Scale BNSSS, Ng, Losdale, & Hodge, 2011).

Rezultati regresione analize pokazuju da percipirana fizička sposobnost i motivaciona klima koju kreiraju saigrači predstavljaju značajan prediktivni model ( $F(3,223)=50.59, p=.00$ ) koji objašnjava 40.5% varijanse potrebe za kompetencijom. Kao značajni individualni prediktori izdvojili su se percipirana fizička sposobnost ( $\beta=.567, p=.00$ ) i motivaciona klima usmerena na učenje koju kreiraju saigrači ( $\beta=.146, p=.02$ ). Mladi sportista koji percipira sebe kao fizički sposobnog i opaža da saigrači kreiraju motivacionu klimu koja je podržavajuća, usmerena na učenje i pružanje emocionalne podrške, u većoj meri imaće zadovoljenu potrebu za kompetencijom. Fizički self u velikoj meri boji doživljaj kompetentnosti u adolescenciji kada adolescent više pažnje posvećuje sopstvenom izgledu i izgradnji ličnog identiteta. Paralelno sa izgradnjom selfa i identiteta, adolescent – mladi sportista – ima pred sobom i razvojni zadatak da uspostavi značajne interpersonalne odnose. Saigrači u okviru sporta predstavljaju vršnjačku grupu u kojoj adolescent formira interpersonalne odnose koji u velikoj meri doprinose njegovom poimanju sebe i ličnog uspeha. Teorijske i praktične implikacije biće razmatrane u radu.

*Ključne reči:* adolescencija, omladinski sport, motivaciona klima, saigrači, fizički self, kompetencija

### Physical self and the perceived behavior of teammates as predictors of the need for competence among young athletes

In accordance with developmental changes in adolescence, this paper examines the relationships between the young athlete's perceived physical abilities, perceived behaviors of teammates, and satisfaction of the need for competence. The need for competence is one of the basic universal needs, which is intensified during adolescence. Young athletes have the need to feel capable, successful in the selected activity and to be viewed as such by others. The perception of personal sports competence is greatly influenced by the physical self - perception of one's own physical ability, but also by the behaviors of teammates. Within the sport, teammates represent a significant social group that shapes values, behavior and identity of a young athlete.

The sample consisted of 262 respondents (boys=131), average age of 13.7 years, who actively train handball, volleyball and basketball for at least 3 years in different clubs from Vojvodina. During 2017/2018. they've completed Physical Self-Efficiency Scale (Ryckman et al., 1982) - subscale Perceived Physical Ability, and the questionnaire Peer Motivational Climate in Youth Sport (MCYSQ, Ntoumanis & Vazou, 2005), with two subscales: task-oriented motivational climate and ego-oriented motivational climate. The need for competence was measured with the score from subscale Competence from the Basic Scale of Basic Psychological Needs in Sport (BNSSS, Ng, Losdale, & Hodge, 2011).

The results of the regression analysis show that the perceived physical ability and motivational climate created by the teammates represent a significant predictive model ( $F(3,223)=50.59, p=.00$ ) which explains 40.5% of variance of the need for competence. Perceived physical ability ( $\beta=.567, p=.00$ ) and task-oriented motivational climate ( $\beta=.146, p=.02$ ) singled out as significant individual predictors. A young athlete who perceives himself as physically able and notices that teammates create a motivational climate that is supportive, focused on learning, and providing emotional support, will have more satisfied need for competence.

Physical self has significant part in development of sense of competence in adolescence. Adolescent devotes more attention to his own appearance and development of self image. Parallel to development of self and identity, adolescent has one more developmental task – forming interpersonal relationships. Teammates in sport represent peer group in which adolescent forms interpersonal relationships that greatly contribute to his own perception of self and personal success. Theoretical and practical implications will be discussed in the paper.

**Keywords:** adolescence, youth sport, motivational climate, teammates, physical self, competence

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Tijana Kabić, Stanislava Popov, Jelena Sokić

*Fakultet za sport i turizam, Novi Sad*

*Email: [tijanakabic@gmail.com](mailto:tijanakabic@gmail.com)*

## Ispitivanje latentne strukture Skale za procenu motivacije maratonaca na populaciji sa prostora bivše Jugoslavije

Iako legenda kaže da je grčki vojnik Filipides, nakon što je pretrčao 42km od Maratona do Atine kako bi javio da su Persijanci poraženi – preminuo, poslednjih godina je sve veći broj onih koji se odlučuju na trčanje ove distance. Nekada je ova disciplina bila rezervisana za atletičare, a danas je među maratoncima sve veći broj rekreativaca, od kojih se neki nikada pre toga nisu bavili sportom.

Broj maratonaca se u periodu od 1977. do 2007. godine u SAD povećao za više od 10 puta, a taj trend rasta i sve veća popularnost trčanja maratona prisutni su i u našoj zemlji. Šta to motiviše ljude na ovu zahtevnu i iscrpljujuću aktivnost, pokušali smo da saznamo na uzorku od 145 maratonaca (101 muškarac, 44 žene). Uslov je bio istrčan makar jedan maraton, a taj broj je varirao od 1 do maksimalnih 208.

Korišćena je Skala za procenu motivacije maratonaca (Motivation of Marathoners Scale – MOMS) konstruisana 1993. godine za sveobuhvatnu procenu razloga za



trčanje maratona (Masters, Ogles & Jonton, 1993). Sadrži 56 tvrdnji, sa sedmostepenom Likertovom skalom odgovora. Ova skala je na našem jeziku samo jednom korišćena, ali za procenu motivacije za dugoprugaško trčanje što obuhvata polu i mini-maraton. Ovde se prvi put koristi samo na populaciji maratonaca.

U cilju ispitivanja latentne strukture skale za procenu motivacije maratonaca, sprovedli smo eksploratornu faktorsku analizu, metodom glavnih komponenti, sa kosom Promax rotacijom. Kajzer-Majer-Olkinov pokazatelj reprezentativnosti (KMO= 0,87), i značajnosti Bartletovog testa sfericiteta ( $\chi^2(1540) = 6473,24, p < 0,001$ ) ukazali su na opravdanost primene ove analize.

Na osnovu paralelne analize retencije faktora, i uz primenu kriterijuma 95. percentila, zadržano je 5 komponenti koje objašnjavaju 56,71% ukupne varijanse. Vrednosti Cronbach alfa koeficijenta kreću se od 0,85 do 0,92 za pojedinačne skale.

Dobijeno je 5 faktora motivacije za trčanje maratona, i oni su imenovani kao: Prevladavanje stresa, Unapređenje mentalnog zdravlja i kontrola težine, Takmičarski duh, Afilijacija, Fizičko zdravlje.

Prema sadržaju izolovanih faktora mogli bismo da zaključimo da osim sportskih u trčanju maratona značajno učestvuju i psihološki faktori. Tu pre svega mislimo na unapređenje mentalnog zdravlja, doprinos osećanju soptvene vrednosti, što znači da uzrok konstantnog porasta broja maratonaca verovatno leži u tome što se sve veći broj ljudi na ovaj način oslobađa od stresa i brine o svom psihičkom, ali i fizičkom zdravlju.

*Ključne reči:* motivacija, trčanje maratona, mentalno zdravlje

## Examination of the latent structure of the Motivation of Marathoners Scale on the population from the territory of the former Yugoslavia

Although the legend says that the Greek soldier Filipides died after crossing 42km from Marathon to Athens to report that the Persians were defeated, there has been an increasing number of those who choose to run this distance in recent years. While this discipline was reserved for athletes before, there is a growing number of recreational runners among the marathoners today, and some of them have never been involved in sports before.

The number of marathoners increased more than 10 times between 1977 and 2007 in the USA, and this trend of growth and the increasing popularity of running marathons are also present in our country. Using a sample of 145 marathoners (101 men, 44 women), we tried to find out what motivates people to this demanding and exhausting activity. The inclusion criterion required that participant had already completed at least one marathon, and this number varied from 1 to maximum 208.



The Motivation of Marathoners Scale (MOMS) was constructed in 1993 for a comprehensive assessment of the reason for running a marathon (Masters, Ogles & Jonton, 1993). It contains 56 items, with a seven-fold Likert response scale. This scale was used only once in the Serbian speaking area, but to estimate motivation for long run, which includes a half and a mini marathon. This was the first time to be used exclusively in the marathon population.

In order to examine the latent structure of MOMS scale, exploratory factor analysis (EFA) (SPSS 21.0) was used. Kaisere-Meyere-Olkin test indicated very good sampling adequacy (KMO = .87)

Latent factors were extracted by principal components analysis, and the optimal number of factors was determined by the parallel analysis with 95% percentile criterion. This criterion suggested a five-factor solution, which explained 56.71 % of the variance.

Cronbach alpha coefficients range from 0.85 to 0.92 for individual scales.

Five factors of motivation for running marathon were isolated: Stress Copying, Mental Health Improvement and Weight Control, Competitive Spirit, Affiliation, Physical Health

According to the content of isolated factors, we could conclude that besides sports, psychological factors are also significantly involved in marathon running. First of all, improving mental health and contribute to the feeling of own value, which means that the cause of the constant increase in the number of marathoners probably lies in the fact that for an increasing number of people this is the way to overcome stress and to take care of their physical as well as physical health.

**Keywords:** motivation, running marathon, mental health

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Petra Anić, Alessandra Pokrajac-Bulian, Miljana Kukić, Tamara Mohorić  
*Sveučilište u Rijeci, Filozofski fakultet, Odsjek za psihologiju*

*Email: [panic@ffri.hr](mailto:panic@ffri.hr)*

## Odnos motivacije i učestalosti vježbanja sa zadovoljstvom izgledom mladih žena

Redovita tjelesna aktivnost predstavlja zdrav način kontrole tjelesne težine. Razumjeti što može motivirati osobu na vježbanje značajno je u prevenciji negativne slike tijela, ekstremnih dijetnih ponašanja i prekomjerne tjelesne težine. Neki pojedinci posjeduju odgovarajuću motivaciju, samopouzdanje i sposobnosti

potrebne za uživanje u fizički aktivnom načinu života (Longmuir i Tremblay, 2016), dok druge osobe vježbaju iz pogrešnih motiva, tako da njihovo vježbanje postaje disfunkcionalno (Dumitru, Dumitru i Maher, 2018).

U istraživanju su sudjelovale 262 ispitanice u dobi od 18 do 29 godina ( $M = 21.52$ ,  $SD = 1.86$ ). Indeks tjelesne mase (ITM) kretao se od 18.03 do 31.51 ( $M = 22.09$ ,  $SD = 2.69$ ). U uzorku je 22.1% djevojaka ispodprosječne težine, 62.3% normativne tjelesne težine, dok je 15.6% prekomjerno teških sudionica. Tjelesnom aktivnošću bavi se 190 ispitanica (72.5%).

Sudionice su odgovarale na pitanja o učestalosti bavljenja tjelesnom aktivnosti, visini i težini te su ispunile Upitnik o motivima za vježbanje (EMI-2, Markland i Ingledew, 1997) i Upitnik sociokulturalnih stavova prema izgledu (SATAQ-4R, Schaefer i sur., 2016). Upitnici pokazuju zadovoljavajuće metrijske karakteristike.

Dvosmjernom analizom varijance provjerene su razlike u motivaciji za vježbanjem i internalizaciji ideala izgleda s obzirom na učestalost vježbanja i ITM. Ispitanice koje vježbaju više puta tjedno, u odnosu na one koje ne vježbaju ili vježbaju samo jednom tjedno, kao motive vježbanja ističu osvježenje, uživanje, izazov, poboljšanje izgleda i povećanje tjelesne snage. Ispitanice koje vježbaju 2 ili 3 puta tjedno čine to i zbog želje za pripadanjem grupi, dok je za ispitanice koje vježbaju 4 i više puta tjedno, značajan motiv vježbanja povećanje tjelesne privlačnosti. Ispitanice koje vježbaju 4 ili više puta tjedno, razlikuju se od ispitanica koje vježbaju rjeđe ili uopće ne vježbaju jer su u većoj mjeri internalizirale ideal mišićavosti kojemu teže. Pripadanje grupi i kontrola tjelesne težine kao motivi za vježbanje, razlikuju djevojke različitoga ITM-e. U odnosu na djevojke višeg ITM-a, one nižega naglašavaju pripadanje grupi kao važan motiv za vježbanje, dok djevojke višeg ITM-a naglašavaju kontrolu tjelesne težine. Prekomjerno teške djevojke češće percipiraju pritisak okoline u smjeru promjene izgleda, odnosno doživljavaju veći pritisak obitelji, vršnjaka, značajnih drugih osoba (npr. romantičnih partnera, trenera) i medija da poboljšaju izgled, smanje količinu masnoća te izgledaju mršavije.

ITM ima važnu ulogu u percepciji pritiska okoline na promjenu izgleda, ali nije povezan s učestalosti vježbanja. Poznavanje motivacije za vježbanje može pomoći u kreiranju programa za poticanje vježbanja koje proizlazi iz zdravih motiva poput osvježenja, pripadanja grupi, uživanja, očuvanja zdravlja, a stavlja u drugi plan potencijalno štetne motive poput tjelesne privlačnosti i mišićavosti.

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**Ključne reči:** motivacija za vježbanje, tjelesni izgled, indeks tjelesne mase, pritisak okoline

## Relationship between motivation for exercise and frequency of exercise with the appearance satisfaction in young women

Regular physical activity represents a healthy way of controlling body weight. Our understanding of motives for exercise has significant role in prevention of negative body-image, extreme dieting behavior and overweight. Some individuals have the proper motivation, self-confidence, and abilities needed to enjoy a physically active lifestyle (Longmuir & Tremblay, 2016), while others exercise for the wrong motives, which can lead to dysfunctional exercise (Dumitru, Dumitru, & Maher, 2018).

Data from 262 female participants, aged from 18 to 29 ( $M = 21.52$ ,  $SD = 1.86$ ) were used. Body mass index (BMI) ranged from 18.03 to 31.51 ( $M = 22.09$ ,  $SD = 2.69$ ). In our sample, 22.1% of girls had below average weight, 62.3% had normative body weight, and 15.6% were overweight. More than 70% of participants ( $N=190$ ) are engaged in some physical activity.

Data were gathered on the frequency of physical activity, body weight and height. Participants also filled Exercise Motivation Inventory (EMI-2, Markland & Ingledew, 1997) and Sociocultural Attitudes Toward Appearance Questionnaire (SATAQ-4R, Schaefer et.al., 2016). Both questionnaires had good psychometric properties.

Using 2-way ANOVA we compared motivation for exercising and the internalization of the ideal body appearance with regard to the frequency of exercise and BMI. Girls who exercise multiple times a week, compared to those who do not exercise or exercise only once a week, emphasize revitalization, enjoyment, challenge, appearance and strength and endurance as main motives for exercising. In addition, girls who exercise 2 or 3 times a week emphasize affiliation as a motive, while for those who exercise 4 or more times a week, a significant motivation to exercise is physical attractiveness. Girls who exercise 4 or more times a week have internalized the ideal muscular body more than girls who are exercising less frequently or not at all.

Affiliation and weight management, as motives for exercise differs for the girls regarding their BMI. Girls with lower BMI emphasize affiliation as a motive, while girls with higher BMI give more value to the body weight control.

Overweight girls perceive more pressure to change their appearance compared to girls with normative weight or girls below average weight. They perceive more pressure from the family, peers, significant others (e.g. romantic partners, trainers, teachers) to look better, to reduce body fat and to look thinner.

BMI has important role in perceiving sociocultural pressure to change appearance, but it is not related to exercise frequency. Identification of main motives for

exercise can help in creating training programs that emphasize healthy motives, such as refreshment, affiliation, enjoyment, health preservation, and give less importance to potentially damaging motives, like the sense of physical attractiveness and muscularity.

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**Keywords:** Key words: motives for exercise, body appearance, body mass index, sociocultural pressure

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Dragan Glavaš<sup>a</sup>, Marko Bičanić<sup>b</sup>, Mario Pandžić<sup>a</sup>, Suzana Obrovac Lipar<sup>a</sup>

<sup>a</sup>*Hrvatsko katoličko sveučilište*

<sup>b</sup>*Trčaona - škola & klub trčanja*

*Email: dragan.glavas@unicath.hr*

## Dimenzije motivacije aktivnih trkača

Koji su motivi za svladavanjem duljih trkačkih staza posebno je aktualno pitanje danas kada sve veći broj rekreativaca pomiče granice svoje tjelesne izdržljivosti i teži svladavanju polumaratona ili maratona. U nastojanju odgovora na ovo pitanje i s ciljem operacionalizacije motivacije za trčanjem maratona razvijena je skala motivacije maraton trkača (Motivation of Marathoners Scale – MOMS; Masters, Ogles i Jolton, 1993). Pretpostavlja devet subskala (Psihološko suočavanje, Samopoštovanje, Smisao života, Usmjerenost na opće zdravlje, Tjelesna masa, Pripadanje, Prepoznavanje, Natjecanje, Postizanje osobnih ciljeva) koje mjere četiri kategorije motiva (Psihološki motivi, Zdravstveni motivi, Društveni motivi, Motivi postiguća). Iako iskorak u konceptualizaciji motivacije u okviru ovog specifičnog oblika ljudskog djelovanja, jezične adaptacije upitnika ipak nisu jasno potvrdile pretpostavljenu strukturu upućujući na moguće adaptacije modela. Cilj ovog istraživanja je testirati pretpostavljenu, odnosno utvrditi najbolju strukturu modela za proučavanje motivacije za ove oblike trčanja. U istraživanju je sudjelovalo 340 rekreativnih trkača (61 muškarac, 279 žena), sudionika škole trčanja (dobi između 19 i 59), s iskustvom trčanja utrka od minimalno 5 kilometara do istrčanog polumaratona. Rezultati konfirmatorne faktorske analize nisu potvrdili pretpostavljenu deveto-faktorsku strukturu, u skladu s testiranjima u drugim jezičnim kontekstima. Naknadni eksploratorni i konfirmatorni postupci uputili su na

sedmo-faktorsku strukturu potvrđujući potrebne modifikacije, a potencijal skale se očituje u modelu s prilagođenim pretpostavljenim subskalama u hrvatskom kontekstu.

*Ključne reči:* Aktivno trčanje, motivacija, zdravlje, maraton

## Motivation dimensions of active runners

The motives for mastering long-distance runs is the especially current question of nowadays when an increasing number of recreational players challenge the limits of their physical endurance and strive to master the half marathons or marathons. The Motivation of Marathoners Scale (MOMS; Masters, Ogles & Jolton, 1993) has been developed in order to answer this question to operationalise the motivation for marathon running. The questionnaire includes nine subscales (Psychological Coping, Self-Esteem, Life Meaning, General Health Orientation, Weight Concern, Affiliation, Recognition, Competition, Personal Goal Achievement) that measure four broader motive categories (Psychological Motives, Physical Health Motive, Social Motives, Achievement Motives). Albeit being a step forward regarding motivation conceptualisation within this specific form of human activity, the language adaptations of the questionnaires did not clearly confirm the assumed structure pointing to possible model adaptations. The aim of this research is to test the assumed structure and to determine the best model for studying the motivation for these forms of running. The research involved 340 (61 males and 279 females) recreational runners, running school attendants, aged between 19 and 59 years, with running experience from a minimum of 5 kilometres to a half-marathon run. The results of CFA did not confirm the assumed original 9-factor structure, in accordance with tests in other language contexts. Further EFA and CFA analyses indicated 7-factor structure confirming the scale modification necessity, and manifesting scale potential in a model with customised sub-scales in the Croatian context.

*Keywords:* Active running, motivation, health, marathon

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PROGRAMSKI ODBOR	ORGANIZACIONI ODBOR
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dr Marija Zotović	dr Jelena Matanović
dr Ivana Mihić	dr Tanja Jevremov
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IZDAVAČ  
Filozofski fakultet Univerziteta u Novom Sadu  
Dr Zorana Đinđića 2, Novi Sad

ZA IZDAVAČA  
Prof. dr Ivana Živančević Sekeruš, *dekan*

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