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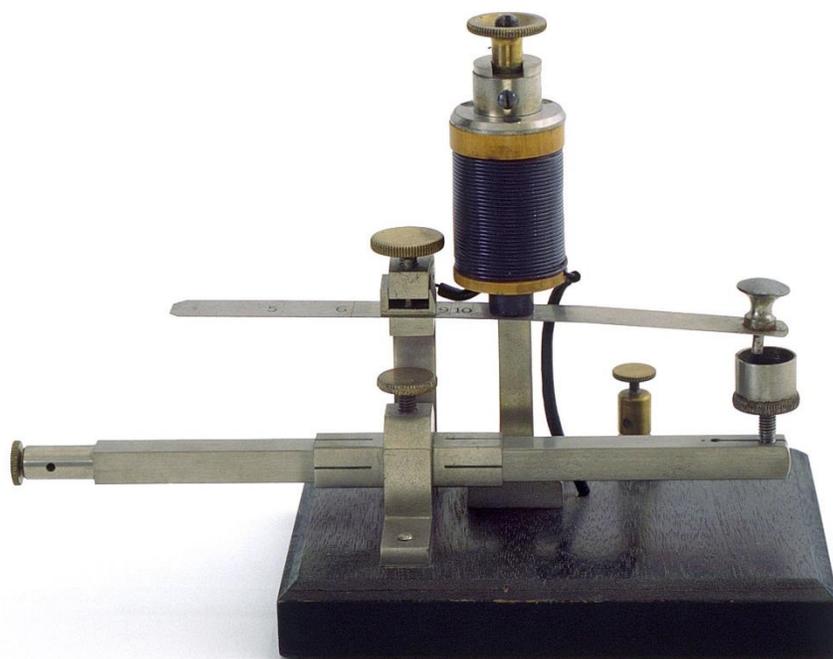
INSTITUTE OF PSYCHOLOGY
LABORATORY FOR EXPERIMENTAL PSYCHOLOGY
FACULTY OF PHILOSOPHY, UNIVERSITY OF BELGRADE

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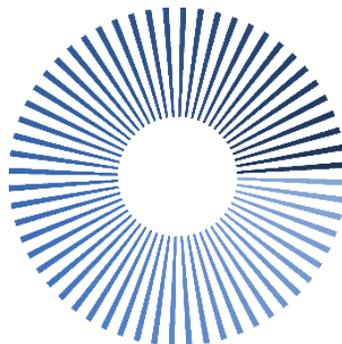
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CONTENTS

PERSONALITY PSYCHOLOGY 43

PSYCHOLOGY OF EDUCATION 59

SOCIAL PSYCHOLOGY

COGNITIVE PSYCHOLOGY

Do Higher-Level Chess Players Rely on Heuristics in General as well as in Chess Problem Solving?

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Abstract

It has been confirmed that expert chess players solve chess positions in a matter of seconds thanks to their ability to match memorized patterns with positional patterns. This superiority usually manifests itself in a context of familiar chess positions and is reflected in speed and accuracy. Chess experts develop an intuitive approach that is occasionally incorrect, especially when it needs to be suppressed by a more analytical approach (e.g. Einstellung effect). This study investigates the intuitive and heuristic approach developed in chess experts, more specifically, it compares how they solve problems inside and outside their domain of expertise. This study was conducted in several chess clubs across Croatia, and participants were chess players with various levels of expertise. Cognitive Reflection Test (CRT) was used to assess general problem solving ability, and specially developed chess problems were used for domain-specific problem solving. The results showed that chess players with greater expertise are more efficient in domain-specific tasks but this is unrelated with efficiency in general tasks. Also, participants more accurate in domain-specific tasks were more accurate in general tasks. Our results suggest that expert chess players might transfer their cognitive style in broader problem-solving domains where it is sometimes useless or even harmful.

Keywords: chess problem solving, Cognitive Reflection Test, expert reasoning, cognitive styles, dual-process theory of thinking

Introduction

The research literature about chess expertise reveals that expert chess players are more dominant in their processing speed than in processing depth when compared to intermediate or amateur chess players (De Groot, 1978). Researchers concluded that chess players utilize memory chunks about chess positions, developed throughout many years of practice, in a reflexive and automatized fashion. These memorized perceptual and conceptual chunks are repeated patterns of chess configuration that can be retrieved easily while relevant features are observed (Potter, 1993; Gobet & Lane, 2010). Expert chess players need to observe only certain segments of a chess position to construct a mental image from long-term memory, shortening the time required to elicitate a move, i.e. the mental representation of the next chess configuration, enabling the probability of a critical positional evaluation (Gobet, 1998). Such processes are initially developed consciously, deliberately and slowly by following chess rules and the knowledge of chess rules. Expert chess skills evolve in heuristic, intuitive and fast mechanisms represented in quick and accurate decisions (Chase & Simon, 1973). The described differentiation in information processing matches the processing mechanisms in dual process theory (Campitelli et al. 2015). Specifically, Type 1 processes (T1) of thinking include chess players' fast and intuitive decision making in familiar chess positions and Type 2 (T2), which includes more explicit logic operations, in less familiar chess positions. T1 and T2 thought processes have several benefits and drawbacks for the problem solver. T1 process might skew the inference due to biased experience, but usually leads to the correct and stereotyped solution. In contrast, the T2 process requires more resources, but leads to the correct solution in a more formal manner even in an unencountered solution. When more general problems are considered (e.g. Hanoi tower problem) they include lesser familiarity and therefore elicitate the T2 process (Evans, 2003). According to prior research, there is no or relatively little (chess) expertise transfer to other fields of problem solving (Gobet, 2016), meaning that experts' domain-specific memory and T1 processing are no longer useful, thus more reliant on T2 processes to solve the problem. It is known that solving a general logical problem requires reasoning that includes meta-cognition (Fletcher and Carruthers, 2012), which may be more developed in those who have more experience in logical problem-solving (Evans, 2003). Comparing differences in cognitive styles, the tendency to solve problems intuitively or reflectively, between those who have more experience with logical problems in some domains and those who do not might be of interest. Investigating such a tendency is possible in a broader context by applying the Cognitive Reflection Test (CRT) (Frederick, 2005), which measures one's tendency to override intuitive responses and engage in more reflective cognitive processes. CRT consists of minimally three problems, sometimes more, each of which has an obvious but incorrect response. The author assumes that an incorrect response is elicited by the activation of the T1 process and the correct response requires the activation of the T2 process. For the T2 to be activated, one must note that the first answer is incorrect, which requires reflection on his one's own cognition. Investigating the role of cognitive styles among chess players might provide insight into the heuristics influencing decision-making in domain-specific, as well as in general problem solving. This could illuminate the general nature of chess experts' cognition. Accordingly, it was expected that expert chess players are prone to be faster and more accurate - efficient in both areas of problem solving.

Method

Sample

A total of 48 chess players participated in the experiment. All are members of different chess clubs in Croatia. The participants' (N=48, age M=30, 5 female) chess expertise was displayed on the chess national rating system scale (ranging from 1547 to 2270 Elo points).
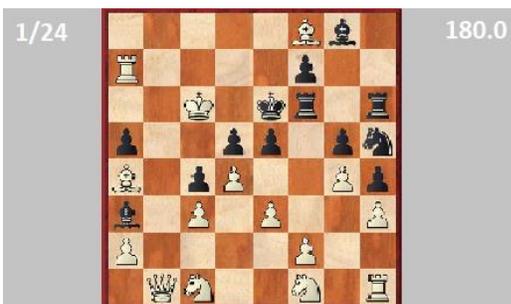
Figure 1: Chess task example.

Design, Materials and Procedure

This study was part of a broader research project on chess expertise. For this particular study, a correlational research design was deployed. The parameters of accuracy and response time in chess and CRT problems were used as variables. Participants solved 24 chess problems (in all of them white mates in two moves), followed by three CRT tasks. All problems were presented on a computer screen. For examples, see Figures 1 and 2. Participants had three minutes per chess problem and no time restriction during CRT assessment. The chess problems were developed carefully in collaboration with an independent group of chess experts, with great variance in difficulty and position motives. Each chess problem was created in order to simulate imaginative processes, simulating both white moves and black countermoves.

Participants responded by clicking the starting and ending square of a given move which triggered response time measurement.

Results

Due to asymmetrically distributed results, nonparametric Spearman's rho correlations were used. The analysis in total can be seen in Table 1. As expected, the results show that chess players with a higher Elo rating are more efficient in chess problem solving, both in accuracy and speed (Elo and accuracy: rho=.77, p<.001, Elo and response time: rho=-.61, p<.001). Additionally, we calculated correlations with specific types of CRT response (reflective vs. intuitive). These results proved most interesting in this study. They show that there is a tendency that players with more chess expertise respond with shorter response time in intuitive responses to CRT problems than less expert players (rho = -.32, p<.05). Furthermore, contrary to expectations, it was shown that chess players more accurate in chess problem solving, were less accurate in CRT (rho = -.29, p<.05).

Figure 2: CTR task example.

Table 1: Spearmans' rho correlations among relevant variables

		Level of expertise	Response time (chess)	Chess accuracy	CRT accuracy	Response time - Reflective response (CRT)	Response time - Intuitive response (CRT)
Level of expertise	rho	—					
Response time (chess)	rho	-0.611***	—				
Chess accuracy	rho	0.771***	-0.598***	—			
CRT accuracy	rho	-0.13	0.223	-0.291*	—		
Response time - Reflective response (CRT)	rho	-0.096	0.470**	-0.144	0.309*	—	
Response time - Intuitive response (CRT)	rho	-0.319*	0.465**	-0.198	-0.107	0.376*	—

Note. * p < .05 ** p < .01 *** p < .001

Duscussion and Conclusion

The aim of this research was to investigate the relationship between chess expertise and cognitive styles in general and in domain-specific problem solving. The hypothesis was that chess players with a higher rating are more efficient (both more accurate and faster) in chess and CRT problem solving and that chess players' problem solving efficiency will positively correlate with their CRT efficiency in general. Results showed a positive correlation between efficiency (both accuracy and speed) in chess problems and chess rating, which confirms the well-known conclusion that chess rating is a precise, established scaling system (Gobet, 1998). It is expected that higher-level chess players solve chess problems more accurately and rapidly, because they use the advantage of mental heuristics based on a vast knowledge base confirming the validity of their decision (Gobet & Simon, 1996b). Classic research on heuristic reasoning (Simon, 1955; Tversky & Kahneman, 1974) showed that people generally make heuristical and incorrect responses rather than correct ones. Frederick (2005) indicates a positive relation with logical reasoning and that CRT results match moderately with measures of cognitive ability. Accordingly, chess skill is positively correlated with intelligence and reasoning (Burgoyne et al., 2016), which implies that more skilled chess players might have higher scores on CRT as well. However, the results obtained in this study indicate that more accurate chess players tend to have lower CRT results, i.e., a less reflective cognitive style. In other words, it seems that they are more prone to use an intuitive approach and heuristics in their decision-making regardless of whether they engage in chess problems or more general problem solving (such as one typical for CRT problems). The literature on chess expertise indicates the frequent of use of heuristics in chess experts' performance and their difficulties in abjuring it, as evinced in Einstellung effect (Bilalić et al., 2008). To conclude, the results suggest that higher-level chess experts are more mentally rigid than lower-level chess players, and that they are also less reflective and prone to use heuristics not only in a specific domain, but in general problem solving as well. Possible reason for such behavior is that the frequent usage of successful heuristics leads to a habit of using heuristics more frequently. In addition, it also instills more confidence in them when making decisions, which is not only limited to a familiar domain. Such a cognitive style is, thus, transferred to other problem solving domains.

References

Burgoyne, A.P., Sala, G, Gobet, F., Macnamara, B.N., Campitelli, G., & Hambrick, D.Z. (2016). The relationship between cognitive ability and chess skill: A comprehensive meta-analysis. *Intelligence*, 59, 72-83.

Bilalić, M., McLeod, P. i Gobet, F. (2008). Why good thoughts block better ones: The mechanism of the pernicious Einstellung (set) effect. *Cognition*, *108*(3), 652-661.

Campitelli, G., Connors, M., Bilalić, M., & Hambrick, D. (2015). Psychological perspectives on expertise. *Frontiers in Psychology*, 6:258.

Chase, W.G., & Simon, H.A. (1973). The mind's eye in chess. In W.G. Chase (Ed.), *Visual Information Processing. Proceedings of the Eighth Annual Carnegie Symposium on Cognition* (pp. 215-281). Academic Press.

De Groot, A.D. (1978). *Thought and Choice in Chess (Revised translation of De Groot, 1946)*. Mouton Publishers.

Evans, J.St.B.T. (2003). In two minds: dual-process accounts of reasoning. *Trends in Cognitive Sciences*, *7*(10), 454-459.

Fletcher, L., & Carruthers, P. (2012). Metacognition and reasoning. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *367*(1594), 1366-1378.

Frederick, S. (2005). Cognitive reflection and decision making. *Journal of Economic Perspectives, 19*(4), 25-42.

Gobet, F. (1998). Expert memory: a comparison of four theories. *Cognition, 66*(2), 115– 152.

Gobet, F., & Lane, P. (2010). The CHREST architecture of cognition: The role of perception in general intelligence. *Proceedings of the 3d Conference on Artificial General Intelligence (AGI-10)*. Atlantis Press.

Gobet, F., Lloyd-Kelly, M., & Lane, P. (2016). What's in a name? The multiple meanings of "chunk" and "chunking". *Frontiers in Psychology*, 7:102.

Potter, M.C. (1993). Very short-term conceptual memory. *Memory & Cognition, 21*, 156-161.

Simon, H.A. (1955). A behavioral model of rational choice. *Quarterly Journal of Economics, 69*, 99–118.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185*, 1124–1131.

Adaptive Memory: The Effect of Danger Signal Frequency on Word Retention

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Abstract

We aimed to investigate whether the frequency of danger signals would affect word retention in the survival-based scenario. The original task (Nairne et al., 2007) was extended by including safety signals (green circle and no tone - G) and danger signals, i.e., predator proximity (red circle followed by a high-frequency sound - R). The signals' ratio varied, resulting in 5 conditions: GGGG, RRRR, GRRR, RGGG, and RRGG. Participants were randomly assigned to groups and were instructed to assess to what extent each of the 32 nouns presented is useful for survival. Upon task completion, participants had 2 minutes to write down items they could remember. ANOVA results indicated no significant differences between the average number of recalled items per group. Levene's test of homogeneity of variance showed the difference between the GGGG and RRRR conditions, where the within-group variability was lower in the RRRR group than in the GGGG group. A visual inspection of the data shows the difference in variability is mainly due to the difference in the upper half of the distribution. Additionally, word retention means for the subsample of the above mean scores differ significantly for the GGGG and RRRR conditions. Our study indicates that a high frequency of danger signals possibly reduces word retention in the survival-based scenario.

Keywords: danger signal frequency; adaptive memory; survival scenario; retention variability

This study was inspired by the research of Nairne (Nairne, Thompson, & Pandeirada, 2007) concerning the evolutive role of memory. Nairne et al. (2007) instructed participants to rate common, neutral nouns for their survival relevance (securing food, water, and protection from predators) in the context of a survival-based scenario (stranded in a foreign land, without basic survival materials). The same words were also rated in non-survival scenarios (pleasantness assessment, relevance of moving to a foreign land, and personal relevance). In surprise retention tests, participants consistently showed the highest retention when words were rated for their survival relevance. These findings suggest that the human memory system might be "tuned" to retain information processed for survival, possibly reflecting an adaptive function.

The survival processing has since been shown to persist across different study designs and recall and recognition tests (e.g., Kostic, McFarlan, & Cleary, 2012; Nairne & Pandeirada, 2010; Otgaar, Smeets, & van Bergen, 2010).

Although survival situations are stressful by nature, the current research suggests that stress is not the mechanism underlying the survival processing advantage. For example, Smeets et al. (2011) found that increased cortisol levels lead to better retention in both survival-based scenarios and control scenarios. These findings are interesting since it has also been shown that retention of stressful situations and stress-related stimuli is enhanced via the HPA axis-based release of adrenal stress hormones acting on brain regions involved in memory formation (Labar & Cabeza, 2006; Phelps, 2004; Quaedflieg & Schwabe, 2017).

Despite stress not being the proximal mechanism of the survival processing advantage, varying degrees of stress might affect retention in the survival-based scenario. This possibility was explored in an experiment in which we manipulated the stress level by varying the frequency of danger signals in the survival-based scenario. We decided to use this manipulation since research on frequency processing indicates that humans are sensitive to various types of frequencies, pointing to their cognitive and ecological relevance (see Zacks & Hasher, 2002).

Method

Design

The independent variable was the presence of a danger signal which was represented by a red circle and a high-frequency sound (R). The absence of danger was represented by a green circle and no additional sound (G). The probability of danger event was a between-subject variable, varied in five conditions - 0, 0.25, 0.5,

0.75, and 1 probability. In other words, the independent variable had five levels: (1) all safety signals – GGGG, (2) one danger and three safety signals - RGGG, (3) two safety and two danger signals – GGRR, (4) one safety and three danger signals – GRRR, (5) all danger signals - RRRR. The order of the signals was random. For example, in the case of one safety and three danger signals, the safety signal could have been placed in four different positions: GRRR, RGRR, RRGR, and RRRG. The dependent variable was the number of reproduced nouns.

Participants

The participants (N = 140, 76.4% female), University of Banja Luka students, were randomly assigned to five groups, with 28 participants per group.

Stimuli

As stimuli, we used the 32 nouns used in the Van Overschelde et al. (2004), translated into the Serbian language: truck, fuel, mountain, pepper, book, charcoal, juice, shoes, finger, aunt, chair, catfish, silver, orange, whiskey, flute, snow, door, cabbage (instead of broccoli from the original list), bear, cathedral, screwdriver, car, sword, apartment, football, crystal, silk, teacher, pan, sock, eagle.

Procedure

Participants received the following on-screen instruction: "Imagine you are in an unknown land, in the age when people survived by hunting and gathering. There is a possibility that you will encounter predators. You will see red and green circles on your screen. A red circle and sound signal predator proximity and a threat to your life. A green circle signals safety and the absence of danger. You will now be presented with a list of words. Please assess how much each word would help you to survive by pressing the numbers on the keyboard. 1 means that a word wouldn't help you at all, and 5 means that a word would be of great help.".

After the instruction, first, a white screen with a black cross was presented for 500 *ms*, and after that, a safety or danger signal was introduced for 1500 *ms*. Following the disappearance of the signal and a 500 *ms* delay, a group of eight words was introduced with the words shown one by one. Each word was presented for five seconds with a 5-point survival-relevance scale. Once a group of nouns was assessed, a signal was again presented, followed by another group of eight nouns. In other words, nouns were split into four groups of eight nouns, with signals preceding them.

In the end, participants were presented with a surprise retention task, where they were given two minutes to write down all the words they could remember.

Results

ANOVA results indicated no significant difference between the number of recalled items per group (*M* range from RRR*R* = 10.96 to GGG*R* = 11.89; Figure 1). However, results of Levene's test of homogeneity of variance indicated a significant difference between the GGGG and RRRR conditions ($F(1, 54) = 7.64$, $p = .008$), with the within-group data variability being lower in the RRRR group (*SD* = 2.76) than in the GGGG group (*SD* = 5.50). A visual inspection of the data indicates that this difference in variability is mainly due to the difference in the upper half of the distribution. In addition, word retention means for the subsample of above the mean scores differ significantly for the GGGG (*M* = 14.81, *SD* = 3.64) and RRRR (*M*=12.72, *SD* = 0.96) conditions ($t(32) = 2.35$, $p = 0.012$, $g = 0.79$ (one-tail)).
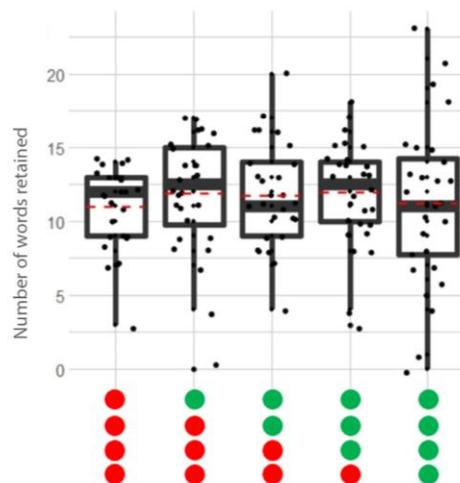
Figure 1: Distribution of retention per experimental group.

Discussion

Our exploratory study points to the possibility that a high frequency of danger signals reduces word retention in comparison to the absence of danger. Namely, word retention means for the subsample of the above mean scores differ significantly between the extreme conditions (GGGG and RRRR). This potential finding is contrary to our intuition that a higher frequency of danger would lead to better retention. We will discuss one possible neurobiological explanation here.

Namely, stressful events direct attentional and memory processes toward stress-related stimuli. Within seconds following stressor onset, the release of catecholamines, including noradrenaline, is triggered. Rapid catecholaminergic and glucocorticoid actions set the brain in a memory formation mode that facilitates the encoding of stressor-related stimuli but impairs the

retrieval of stressor-unrelated stimuli (Quaedflieg & Schwabe, 2017). Because the nouns evaluated in terms of usefulness were neutral and therefore not inherently related to the stressor, reduced retention manifested as reduced variability in the number of retained words.

In future studies, we should explore this potential neurobiological explanation by including a stressor-related noun condition, as well as expanding to contemporary scenarios. Also, the length of the experiment should be manipulated since the memory formation mode might take a longer time to reach full effect (Droste et al. 2008). Furthermore, we should address other techniques to manipulate the probability of danger which could be more meaningful from the evolutionary perspective, for example, by using other fear-relevant stimuli (e.g., Lobue & DeLoache, 2008) as danger signals.

References

Kostic, B., McFarlan, C. C., & Cleary, A. M. (2012). Extensions of the survival advantage in memory: examining the role of ancestral context and implied social isolation. *Journal of Experimental Psychology*: *Learning, Memory, and Cognitio*n, *38*, 1091–1098. https://doi.org/10.1037/a0026974

Droste, S. K., de Groote, L., Atkinson, H. C., Lightman, S. L., Reul, J. M., & Linthorst, A. C. (2008) Corticosterone levels in the brain show a distinct ultradian rhythm but a delayed response to forced swim stress. Endocrinology, 149(7), 3244-3253. https://doi.org/10.1210/en.2008-0103

LaBar, K. S., & Cabeza, R. (2006). Cognitive neuroscience of emotional memory. *Nature Reviews Neuroscience, 7*(1), 54–64. https://doi.org/10.1038/nrn1825

Lobue, V., DeLoache, J.S. (2008). Detecting the snake in the grass: attention to fear-relevant stimuli by adults and young children. *Psychological science, 19*(3), 284–289. https://doi.org/10.1111/j.1467-9280.2008.02081.x

Nairne, J. S. (2010). Adaptive memory: Evolutionary constraints on remembering. In B. H. Ross (Ed.), *The psychology of learning and motivation: Advances in research and theory* (pp. 1–32). Elsevier Academic Press. https://doi.org/10.1016/S0079-7421(10)53001-9

Nairne, J. S., & Pandeirada, J. N. S. (2010). Adaptive memory: Ancestral priorities and the mnemonic value of survival processing. *Cognitive Psychology*, *61*, 1–22. https://doi.org/10.1016/j.cogpsych.2010.01.005

Nairne, J. S., Pandeirada, J. N. S., Gregory, K. J., & Van Arsdall, J. E. (2009). Adaptive memory: Fitness-relevance and the hunter-gatherer mind. *Psychological Science, 20*(6),740–746. https://doi.org/10.1111/j.1467-9280.2009.02356.x

Nairne, J. S., Thompson, S. R., & Pandeirada, J. N. S. (2007). Adaptive memory: Survival processing enhances retention. *Journal of Experimental Psychology*: *Learning, Memory, and Cognition*, *33*(2), 263–273. https://doi.org/10.1037/0278-7393.33.2.263

Phelps, E. A. (2004). Human emotion and memory: interactions of the amygdala and hippocampal complex. *Curr. Opin. Neurobiol*. *14*, 198–202. https://doi.org/10.1016/j.conb.2004.03.015

Smeets, T., Otgaar, H., Raymaekers, L., Peters, M. J. V., & Merckelbach, H. (2011). *Survival processing in times of stress. Psychonomic Bulletin & Review, 19*(1)*, 113–118.* https://doi.org/10.3758/s13423-011-0180-z

Van Overschelde, J. P., Rawson, K. A., & Dunlosky, J. (2004). Category norms: An updated and expanded version of the Battig and Montague (1969) norms. *Journal of Memory and Language*, *50*(3), 289–335. https://doi.org/10.1016/j.jml.2003.10.003

Otgaar, H., Smeets, T., & van Bergen, S. (2010). Picturing survival memories: Enhanced memory after fitness-relevant processing occurs for verbal and visual stimuli. *Memory & Cognition*, *38*, 23–28. https://doi.org/10.3758/MC.38.1.23

Quaedflieg, C. W. E. M., & Schwabe, L. (2017). Memory dynamics under stress. *Memory*, *26*(3), 364–376. https://doi.org/10.1080/09658211.2017.1338299

Zacks, R. T., & Hasher, L. (2002). Frequency processing: A twenty-five year perspective. In P. Sedlmeier & T. Betsch (Eds.), *ETC. Frequency processing and cognition* (pp. 21–36). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198508632.003.0002

Confident and with Good Reason? Relationship between Judgment of Task-Solving Ability and Final Judgment of Confidence on Syllogistic Reasoning Tasks

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Abstract

Meta-reasoning refers to processes that monitor both the progress and outcome of reasoning and problem-solving. The aim of this study was to examine the effects of validity and believability as heuristic cues on judgments of task-solving ability i.e. prospective judgments of performance and final judgments of confidence in syllogistic reasoning tasks, as well as the relationship between two of these processes. Prior to completing 16 pairs of syllogistic reasoning tasks in which conclusions were either logical or illogical and believable or unbelievable, participants (N=90) read the task as fast as they could, after which they estimated how sure they were that they would solve the task correctly on a 50% to 100% scale. After completing the task, participants rated their confidence in their final answer on the same scale. Results revealed that prospective judgments of performance relied on believability and validity as heuristic cues, even after brief exposure to problems. Furthermore, a similar pattern of registered effects of validity and believability on both prospective judgments of performance and final judgments of confidence suggest a common underlying process for different meta-reasoning judgments.[1]

Keywords: meta-reasoning, syllogistic reasoning, judgment of task-solving ability, judgment of confidence

Introduction

Meta-Reasoning processes monitor the progress of reasoning and problem-solving activities and they allocate cognitive recourses and regulate the time and effort devoted to different tasks (Nelson & Narens, 1990; Ackerman & Thompson, 2017). Although these processes are not directly introspective, they appear as feelings of (un)certainty about how successful the reasoning process has, or will unfold (Clore & Parrot, 1994; Ackerman & Thompson, 2017). These feelings, known as metacognitive judgments, rely on heuristic cues that represent implicit information regarding tasks or an individual's previous experience and they are generally predictive of subsequent performance (Koriat, 1997; Ackerman, 2019). Two of the cues that individuals rely on while solving syllogistic reasoning tasks appear to

be the validity and believability of conclusions (Shynkaruk & Thompson, 2006). This study aimed to examine whether individuals are able to rely on two of those heuristic cues even after brief exposure to the problem, prior to task solving, introducing the newly proposed judgments of task-solving ability i.e. prospective judgments of performance. It also aimed to examine the effects of these cues on the final judgment of confidence and its relationship to previously proposed measure by comparing the pattern of expected effects.

Method

Sample

A total of 90 undergraduate students of psychology at Faculty of Philosophy, University of Belgrade, participated in the study in return for course credit. Informed consent was obtained from all participants in the study.

Materials

By crossing dimensions of conclusion validity and believability, 16 pairs of syllogistic reasoning problems were constructed. Congruent syllogisms were ones in which the conclusion was both logical and believable or illogical and unbelievable, while incongruent were the ones in which logicality and believability of the conclusion were conflicted. The following task format was adopted:

> *Birds have a beak.*
> *A pigeon is a bird.*
>
> *The pigeon has a beak.*

Participants' task was to determine whether the conclusion follows logically from the presented premise, regardless of the believability by clicking on YES or NO button.

Two rating scales regarding prospective judgments of performance and final judgments of confidence were also included. Since the participants had a prior fifty-fifty chance of solving the task correctly simply by the luck, scales used to asses two of the judgments ranged from 50% (Not certain at all/Certain by chance) to 100% (Completely certain). When assessing the prospective judgment of performance,

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[1] The results displayed in this resume were obtained on the larger sample than the one mentioned in the earlier submitted abstract form, while this resume also takes different and more detailed approach to analyses that were previously portrayed.

participants were asked "*How certain are you that you would solve the task correctly?*", that is "*How confident are you that you have provided the correct answer?*" when assessing the final judgment of confidence. Participants rated their (un)certainty by sliding the pointer on a scale which showed the percentage of their beliefs.

Procedure

By checking the preconditions regarding the online research participation, participants completed two of the practice tasks. They were instructed to read the premises and the conclusion of the presented syllogism as fast as they could, clicking on the "Next" button as soon as they did. They were then asked to estimate how sure they were that they would solve the task correctly on 50% to 100% scale. By giving the estimation, participants were then presented with the same task and given unlimited time to provide an answer, after which they were asked to rate how confident they were in the provided answer on the same scale. Once they have finished two practice blocks, the procedure was repeated using 16 pairs of syllogistic problems that were presented in random order.

Results

Two-way repeated measures ANOVA firstly revealed a statistically significant effect of validity ($F(1,89)=42.85$, $p<.01$) and believability ($F(1,89)=11.28$, $p<.01$) on accuracy, as well as significant interaction ($F(1,89)=72.182$, $p<.01$), suggesting that overall incongruent syllogisms were more difficult to solve ($M_{\text{logical-unbelievable}}=3.13$, SD=1.19; M; $M_{\text{illogical-believable}}=2.40$, SD=.1.43) than congruent ones ($M_{\text{logical-believable}}=3.72$ SD=.56; $M_{\text{illogical-unbelievable}}=3.86$, SD=.41). Furthermore, two-way repeated measures ANOVA revealed significant effects of validity ($F(1,89)=10.55$, $p<.01$) and believability ($F(1,89)=9.95$, $p<.01$) on prospective judgments of performance, as well as significant interaction ($F(1,89)=5.41$, $p<.05$). Initial judgments of performance were higher for valid than for invalid conclusions, and for believable than for unbelievable conclusions. Results are shown in Figure 1.
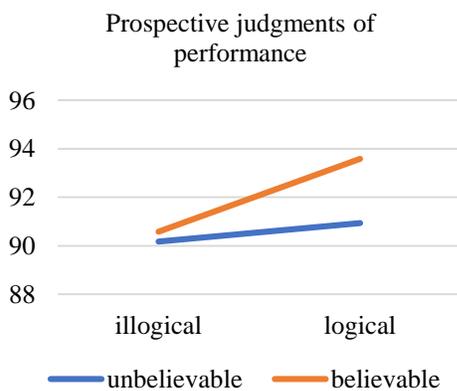
Figure 1: Prospective judgments of performance rated on 50 to 100% (*y* axis) scale depending on logicality and believability

A significant effect of validity ($F(1,89)=18.91$, $p<.01$), and significant interaction between validity and believability ($F(1,89)=28.28$, $p<.01$) were revealed for final judgments of confidence. Participants were most confident in the answers they provided when solving believable valid syllogisms and least confident in the ones they gave when solving unbelievable valid problems. Results are shown in Figure 2.
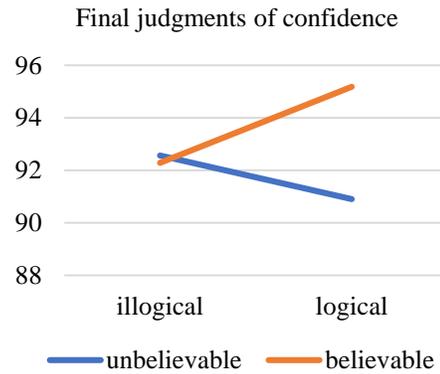
Figure 2: Final judgments of confidence rated on 50 to 100% (*y* axis) scale depending on logicality and believability

Discussion

Firstly, the results of this research confirmed the classical finding that incongruent tasks are more difficult to solve compared to congruent ones (Evans et al., 1983). More importantly, the obtained results indicated that initial prospective judgments of performance relied on believability and validity as heuristic cues, even after brief exposure to syllogistic problems and even before the initial response was generated. Participants were able to quickly detect the validity of syllogisms, since they rated believable valid syllogisms as more likely to be solved correctly than believable invalid syllogisms. What is more, participants also reported the highest confidence in the answers they had given when solving believable valid syllogisms. An overall similar pattern of effects obtained for both prospective judgments of performance and final judgments of confidence not only shows that both judgments rely on heuristic cues, but also suggests that there is a common underlying process for different metacognitive judgments. At last, it should be noted that this study introduced a new methodology regarding brief exposure to a problem prior to its solving, bringing out the newly proposed measure, prospective judgments of performance, that differs from similar ones used in previous studies (e.g. prior judgment of performance or difficulty (Bajšanski et al., 2014) or judgment of solvability that participants give regarding their belief about whether a certain problem has a solution at all (Lauterman & Ackerman, 2019)). Hence, the methodology should be replicated in order to examine the robustness of registered effects, as well as to examine the relationship

with similar judgments. The methodology could also be improved by limiting the time that participants have when first reading the problem. At last, future studies should take into account other heuristic cues regarding syllogisms (such as mood of premises, syllogism figure, and task format).

References

Ackerman, R. (2019). Heuristic cues for meta-reasoning judgments: Review and methodology. Psihologijske teme, 28(1), 1-20. https://doi.org/10.31820/pt.28.1.1

Ackerman, R., & Thompson, V. A. (2017). Meta-reasoning: Monitoring and control of thinking and reasoning. Trends in cognitive sciences, 21(8), 607-617. https://doi.org/10.1016/j.tics.2017.05.004

Bajšanski, I., Močibob, M., & Valerjev, P. (2014). Metacognitive judgments and syllogistic reasoning. Psihologijske teme, 23(1), 143-166. Obtained from: https://hrcak.srce.hr/120498

Clore, G. L., & Parrott, W. G. (1994). Cognitive feelings and metacognitive judgments. European Journal of Social Psychology, 24(1), 101-115. https://doi.org/10.1002/ejsp.2420240108

Evans, J. S. B. T., Barston, J. L., & Pollard, P. (1983). On the conflict between logic and belief in syllogistic reasoning. Memory & cognition, 11(3), 295-306. https://doi.org/10.3758/BF03196976

Jameson, K. A., Narens, L., Goldfarb, K., & Nelson, T. O. (1990). The influence of near-threshold priming on metamemory and recall. Acta Psychologica, 73(1), 55-68. https://doi.org/10.1016/0001-6918(90)90058-N

Koriat, A. (1997). Monitoring one's own knowledge during study: A cue-utilization approach to judgments of learning. Journal of experimental psychology: General, 126(4), 349. https://doi.org/10.1037/0096-3445.126.4.349

Lauterman, T., & Ackerman, R. (2019). Initial judgment of solvability in non-verbal problems–a predictor of solving processes. Metacognition and Learning, 14(3), 365-383. https://doi.org/10.1007/s11409-019-09194-8

Shynkaruk, J. M., & Thompson, V. A. (2006). Confidence and accuracy in deductive reasoning. Memory & cognition, 34(3), 619-632. https://doi.org/10.3758/BF03193584

Does Time Pressure Make Us Illogical?

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Abstract

Hybrid models of reasoning posit the concept of logical intuitions that are based on highly automatized mindware, that is – knowledge about mathematical, logical, and probabilistic principles. The aim of the present study was to investigate precisely when logical intuitions activate. To this end, we have conducted an experimental study and employed the two-response paradigm which allowed for delineating intuitive from deliberative answers on cognitive reflection test. We also registered participants intelligence, mindware and executive functions in order to use these known correlates to pinpoint the logical intuitions timeframe. The results indicate that logical intuitions activate in the first 250 ms after participants have read the task.

Keywords: dual process theories, logical intuitions; mindware; executive functions; intelligence

Introduction

Dual process theories pertain to a group of cognitive processing models based on the idea that human reasoning operates by two types of processes – the Type 1 and the Type 2 processes (Wason & Evans, 1974) which are also labelled intuitive and deliberative processes. Intuitive processes are automatic, associative, fast, high-capacity, and do not engage working memory. Deliberative processes are intentional, slow, low-capacity, and engage working memory, i.e., controlled attention (Evans, 2019; Evans & Stanovich, 2013; Pennycook, 2017). In order to describe the interaction between these processes, different dual processing models have been proposed, and the latest type are the hybrid models (e.g., the Three-stage Model by Pennycook et al., 2015). These models are serial in that they describe the activation of two types of processes as sequential – during reasoning, intuitive processes are activated first, and deliberative processes take part later if certain conditions are satisfied (Pennycook et al., 2015). So, in the initial stages of reasoning, multiple intuitive processes are activated in parallel, and these intuitions take at least two forms – heuristic and logical intuitions (De Neys, 2012). Heuristic intuitions are based on experience (e.g., stereotypes), while logical intuitions are based on highly automated mindware – knowledge of logical, probabilistic, and mathematical principles that are necessary to solve any reasoning task (Perkins, 1995). However, when this knowledge is adopted to such an extent that it is automated, it can be used intuitively (Burič & Konradova, 2021). When heuristic and logical intuitions cue different answers, i.e., when there is a conflict, if one detects this conflict, Type 2 or deliberative processes can be activated (De Neys, 2017). Therefore, in order to detect the conflict and/or give a correct answer, one does not have to engage in cognitively expensive deliberative processing, as multiple intuitions, or a logical intuition will suffice, respectively. Apart from the mindware they are based on (Burič & Šrol, 2020), logical intuitions are also positively correlated to cognitive abilities (Thompson et al., 2018). The findings pointing to the existence of logical intuitions, as well as the findings on the correlates of this construct, are not numerous, but are consistent. However, it was not previously addressed when logical intuitions activate, apart from the fact that they are generated before Type 2 processing. Therefore, the aim of the present study was to pinpoint the timeframe in which logical intuitions give outputs. To this end, we conducted an experimental study and employed the two-response paradigm (Thompson et al. 2011), a procedure in which participants are presented with the same reasoning tasks twice – once with a strict time limit to capture intuitive response, and then with unlimited time so that deliberative processing can take part. In the present study, the time limitations were calculated by data driven approach, and not by using data from different sample of participants. Further, total of six strict time limits were used, and previous research findings regarding correlates of logical intuitions, were used to pinpoint in which one of the multiple restricted time conditions logical intuitions activate.

Method

Participants

Sample consisted of 195 participants. Participants were recruited via Facebook advertisement and data were collected online.

Design and variables

The study consisted of an experimental and correlational part. The experimental part followed a 2 (CRT response time condition: limited, unlimited; within subjects) x 6 (group: time limited to 250, 500, 750, 1000, 1250, 1500ms; between subjects) factorial design. In the correlational part the measures of executive functions (updating, shifting, inhibition; Miyake et al., 2000), intelligence and mindware were used as predictors of the number of correct responses on CRT in both limited and unlimited time conditions.

Materials

Materials used in this study consisted of: CRT (8 tasks; Damnjanović et al., 2019) presented in a multiple choice form – correct, heuristic and the most common atypical answer (Damnjanović et al, 2019; Ilić & Damnjanović, 2021); executive functions battery (Živanović, 2019); short Raven's progressive matrices (RPM; Živanović, 2019); 21 mathematical problems (developed for the purposes of this study); CRT reading speed test comprising the total of 40 sentences (5 sentences per CRT task, matched in length (both letters and words) and structure with the particular CRT task).

Procedure

Study procedure was as follows: (1) all participants read 40 sentences in a randomized order to measure CRT reading speed; (2) solved CRT within a strict time limit calculated, for each CRT task separately, as the mean reading speed for 5 sentences corresponding to that particular CRT + 250-1500ms; (3) solved 21 mathematical problems to measure mindware; (4) following the two response paradigm (Thompson et al. 2011), all participants completed CRT again, but in unlimited time condition, (5) and solved 3-back task, Stroop task, Local-global task and short Raven's progressive matrices.

Results

ANOVA revealed differences in the number of correct answers (accuracy) between limited and unlimited time conditions ($F(1, 192) = 270.858., p < .001$). No differences in accuracy between 6 groups in restricted conditions were observed ($F(5, 187) = 0.177, p = .971$).

Results of regression analyses predicting accuracy in both limited and unlimited condition are presented in Table 1. The mindware predicted accuracy in both restricted and unrestricted CRT tasks. Regression analyses for each group separately revealed that the only significant model predicting accuracy in different limited time conditions (i.e. groups) was the 250 ms condition model – accuracy was positively predicted by scores on stroop (inhibition), local-global (shifting) and mindware.

The two-response paradigm allows for registering patterns of participants' answers which take four forms: correct-correct, correct-incorrect, incorrect-correct, and incorrect-incorrect. 32% of the times participants failed to solve a CRT task regardless of time restriction condition. However, in 34% of correct trials in unlimited time condition, half were preceded by correct answers given with a strict time limit.

Table 1. Results of regression analyses where CRT accuracy was predicted by executive functions, intelligence, and mindware measures.

Factor	Condition	R^2	p	β (** – p < .01)				
				3-back	Stroop	Local-global	RPM	Mindware
CRT response time condition	Limited	.074	0.012	-0.007	0.134	0.034	0.063	0.221**
	Unlimited	.371	<.001	-0.008	0.053	0.025	0.039	0.600**
Group (time limited to)	250ms	.430	0.001	0.113	0.368*	0.306*	0.051	0.380*
	500ms	.341	0.082	0.084	-0.312	-0.054	0.408	0
	750ms	.179	0.286	-0.279	0.018	-0.198	0.24	0.144
	1000ms	.147	0.476	-0.159	0.172	-0.087	0.083	0.348
	1250ms	.229	0.297	0.174	0.07	0.149	-0.449	0.632*
	1500ms	.150	0.601	-0.078	0.108	0.122	0.497	-0.629

Discussion

In order to pinpoint the timeframe in which logical intuitions, a concept introduced in hybrid models of dual processing, activate and give outputs, we conducted an experimental study in which we imposed participants with strict time limits for solving a CRT task. In line with the findings supporting the hybrid models of reasoning (e.g., Burič & Šrol, 2020), we registered that participants are indeed capable of intuitively solving reasoning tasks correctly – half of the participants who correctly solved a task in unlimited time condition also gave correct answer in the limited time condition. Next, although we registered significant difference between the accuracy in limited and unlimited time conditions, we did not register a significant difference between groups – all participants solved statistically the same number of tasks in limited time condition regardless of the time allowed. Further, we conducted multiple regression analyses which revealed that accuracy in both restricted and unrestricted conditions can be predicted by mindware. This is expected as we need mindware to solve any task, but an automated mindware is necessary for logical intuitive reasoning (Burič & Konradova, 2021). Finally, to examine in which timeframe logical intuitions are active, we conducted six multiple regressions with accuracies in CRT for each group as dependent variables and mindware, progressive Raven's

matrices scores, and scores on executive functions tasks as predictors. The only statistically significant model was registered in the 250ms time limit condition. Since logical intuitions are known to correlate with cognitive abilities, and mindware, the results point to a conclusion that the first 250ms are probably the point in time when logical intuitions are already activated and give outputs. This conclusion takes into account that intuitions might be activated even during task reading. Further improvements of methodology are needed to pinpoint the exact time, and not the timeframe, of logical intuitions. The present study also has some other limitations. The small sample by group might have led to registering some random effects. Also, the fact that we also registered that mindware was significant predictor of accuracy in 1250ms condition, and the fact that there were many missing values (participants didn't have time to provide an answer) indicate that procedure for measuring participants' reading speed might have not been precise enough. Namely, it is possible that participants read tasks slower than texts of the same length. Future studies should address these problems.

References

Burič, R., & Konrádová, Ľ. (2021). Mindware instantiation as a predictor of logical intuitions in the Cognitive Reflection Test. *Studia Psychologica, 63*(2), 114-128.

Burič, R., & Šrol, J. (2020). Individual differences in logical intuitions on reasoning problems presented under two-response paradigm. *Journal of Cognitive Psychology, 32*(4), 460-477.

Damnjanović, K., Novković, V., Pavlović, I., Ilić, S., & Pantelić, S. (2019). A cue for rational reasoning: Introducing a reference point in cognitive reflection tasks. *Europe's journal of psychology*, *15*(1), 25.

De Neys, W. (2012). Bias and conflict: A case for logical intuitions. *Perspectives on Psychological Science*, *7*(1), 28-38.

De Neys, W. (2017). Bias, conflict, and fast logic: Towards a hybrid dual process future?. In W. De Neys (Ed.), *Dual Process Theory 2.0* (pp. 47-65). Oxon, UK: Routledge.

Evans, J. S. B. (2019). Reflections on reflection: the nature and function of type 2 processes in dual-process theories of reasoning. Thinking & Reasoning, 25(4), 383-415.

Evans, J. S. B., & Stanovich, K. E. (2013). Dual-process theories of higher cognition: Advancing the debate. *Perspectives on psychological science, 8*(3), 223-241.

Ilić, S., & Damnjanović, K. (2021). The effect of source credibility on bullshit receptivity. *Applied Cognitive Psychology*, *35*(5), 1193-1205.

Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis. *Cognitive psychology*, *41*(1), 49-100.

Pennycook, G., Fugelsang, J. A., & Koehler, D. J. (2015). What makes us think? A three-stage dual-process model of analytic engagement. *Cognitive psychology, 80*, 34-72.

Perkins, D. (1995). *Outsmarting IQ: The emerging science of learnable intelligence*. Simon and Schuster.

Thompson, V. A., Pennycook, G., Trippas, D., & Evans, J. S. B. (2018). Do smart people have better intuitions?. *Journal of Experimental Psychology: General, 147*(7), 945.

Thompson, V. A., Turner, J. A. P., & Pennycook, G. (2011). Intuition, reason, and metacognition. *Cognitive psychology, 63*(3), 107-140.

Živanović, M. (2019). Efekti transkranijalne neuromodulacije fronto-parijetalne funkcionalne mreže na više kognitivne funkcije. Doktorska disertacija. Filozofski fakultet, Univerzitet u Beogradu, Beograd.

Wason, P. C., & Evans, J. S. B. (1974). Dual processes in reasoning?. *Cognition, 3*(2), 141-154.

Is there a Difference in the Stroop Effect in Latin and Cyrillic Words?

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Abstract

The main goal of this research was to examine the Stroop effect in Cyrillic and Latin words. The Stroop task enables the examination of the relationship between the perceptual demand of the stimulus and the reading process. The experiment involved 33 subjects who first learned Cyrillic. Two factors were varied: the alphabet (Latin and Cyrillic) and the congruence of the color and color name (congruent and incongruent). Reaction time (RT) was measured as dependent variable. The results show that there is a main effect of the alphabet on RT. Latin words are processed faster than Cyrillic. A statistically significant interaction between varied factors was also found. In Latin words there is a difference in processing stimuli, while in Cyrillic words there is none. The obtained differences in the Stroop effect can be partially explained by the different complexity of the letters and the greater cognitive engagement involved in their processing.

Keywords: Stroop effect, Latin, Cyrillic

Introduction

Language represents a symbolic system composed of signs and rules that enable us to communicate and interpret the world around us. Although those signs and symbols are used for speech or verbal expression, there is another aspect of expression through the writing system. The writing system represents the graphical representation of language in the form of strings or letters. They use visual symbols to represent language. In its outer form, writing appears as strings of characters arranged along lines. In its inner structure it concentrates on representing the words of a language (Kessler & Treiman, 2015). Most often, writing systems are divided based on the symbols they use. Systems that use symbols that stand for morphemes are called logographies. Phonographic systems in which the basic elements represent syllables are syllabaries, and phonographic systems in which the basic elements represent phonemes are alphabets (Kessler & Treiman, 2015; Sampson, 1985;). The Serbian language has an alphabetic writing system. It consists of a set of letters in which each letter usually corresponds to a phoneme or voice of a certain spoken language (Vejnović, 2012). The Serbian language is also characterized by a specific phenomenon of bialphabetism or synchronous digraphy. This is parallel use of two alphabetic systems - Latin and Cyrillic (Ivković, 2013; 2015). Both systems are composed of thirty letters, where each letter is represented by one grapheme, except for the letters "dz", "lj" and "nj" in the Latin alphabet. Each letter in both alphabets has its own phonemic interpretation, i.e.

stands for one phoneme that never changes. Most of the total number of letters (characters) Cyrillic and Latin alphabets are specific only to one or the other alphabet, but there are also a certain number of shared letters. Namely, there are several letters that appear in both alphabets and have the same phonemic interpretation (A, E, J, K, M, O, T), but there is also a smaller number of letters (B, N, P, C) that occur in both alphabets and have a different phonemic interpretation (Lukatela & Turvey, 1998; Lukatela, Savić, Ognjenović, & Turvey, 1978).

Generally speaking, the sequence of cognitive processes during reading is the same (or similar) for all systems. At the first level, visual information is presented in the form of graphemes, and then these input data are compared with knowledge stored in long-term memory (lexical, syntactic, semantic or general knowledge). The final goal is the understanding of words, sentences and text (Li et al., 2022). At that basic, first level, the visual system needs to detect and integrate the visual characteristics of which graphemes are made. If there is a difference in the appearance and visual complexity of individual letters, there will be a difference in the perceptual demands of reading these writing systems.

Verhoeven and Perfetti (2021) investigated the systematic variations of different languages and writing systems and their effects on the reading process. They emphasized the graphic complexity that can be different in different writing systems, but also within a single type. For example, Latin-based alphabets are less complex than other alphabetic writing systems when taking into account the shape and visual appearance of the letters.

The examination of perceptual limitations in reading different writing systems was examined through the Stroop paradigm (Fang, Tzeng, & Alva, 1981; Levitt, Nakakita, & Katz, 2015). The Stroop effect is an interference between reading the words in color and the perception of the color in which the words are written. Reading is an automatic process that is initiated by the presentation of words (Kostić, 2006; Moors & Houwer, 2006) and it is faster than naming word properties (MacLeod, 2015). The visual complexity of letters is negatively correlated with the efficiency of their identification (Pelli, Burns, Farell, & Moore-Page, 2006), so it can affect the reading process.

The main goal of this research was to examine the Stroop effect in Cyrillic and Latin words. Most Cyrillic letters contain junctions that represent connections between letter lines, which makes them visually more complex. Although objective measurements of the visual complexity of letters

have not been done within the Serbian language, there is research that shows that the Russian Cyrillic alphabet has substantially more average complexity than the Latin based alphabets (Verhoeven & Perfetti, 2021). That finding can partially support our assumptions. Given that the visual complexity of letters is related to the speed of their identification, we can assume that graphemically more complex Cyrillic letters will affect the efficiency of their recognition and reading, and thus will model the Stroop effect.

Method

Sample

The sample consisted of 33 students of the University of Banja Luka, aged 19 to 25. All subjects were equal in terms of which letter they learned first (Cyrillic). The second criterion was the absence of a preference for one alphabet in reading and writing. Subjects provided subjective assessments of letter preferences in reading and writing (separately), and we only analyzed data for those who did not have preferences.

We obtained verbal consent for participation in the experiment from all respondents and none of them reported the existence of a color vision deficiency.

Design and Procedure

Two factors were varied: the alphabet (Latin and Cyrillic) and the congruence of the color and color name (congruent and incongruent). In congruent condition word "RED" was printed in red color, while in incongruent condition was printed in blue color. An example of stimuli is shown in Figure 1. The classic Stroop task was used in which the subjects had to choose the color of the stimulus (word) that was shown to them. Five colors were used: red, green, blue, purple, and brown. Participants gave answers by pressing the appropriate key on the keyboard. Each of the five keys used was marked with a sticker of the appropriate color. Each participant had 40 trials with an additional five trials for exercise. The first twenty exposures contained congruent stimuli and the remaining twenty were incongruent ones. Considering that earlier research shows that the magnitude of the Stroop effect increases with the increase in the proportion of congruent items because participants modulate their attention to words (Lowe & Mitterer, 1982), we decided to keep the ratio of congruent and incongruent exposures the same. Even if blocked exposures of congruent and incongruent stimuli would affect selective attention, first exposure of congruent stimuli would not affect cognitive control, because there is no conflict in these conditions (Botvinick et al,. 2001). It is important to note that cognitive control is a broader concept than selective attention in that it refers to the entirety of mechanisms used to control thought and behavior to ensure goal-oriented behavior (e.g., response inhibition) which is crucial for Stroop task (Parri et al., 2022). We combined each color an equal number of times with another color (in incongruence condition) because earlier

findings show that both the choice of colors and the frequency of combining pairs affect the strength of the Stroop effect (Jacoby, Lindsay, & Hessels, 2003). Reaction time and response accuracy were monitored. Data analysis was done only for correct answers.

Figure 1. Examples of stimuli in the experiment

Results

The results showed that there is a main effect of the alphabet on RT (F(1,2642)=7.67, p<.01, ŋ²=.003). Latin words were processed faster than Cyrillic. A statistically significant interaction between varied factors (F(1,2642)=9.33, p <.01, ŋ² = .004) was also found (Figure 2). In Latin words, there was a difference between congruent and incongruent stimuli (57.90ms, (95% CI, -101.56ms to -14.23ms), p<.01). But in Cyrillic words, there was no interference, and the reaction time did not differ for congruent and incongruent stimuli (48.79ms, (95% CI, -4.861ms to 102.44ms), p>.05).
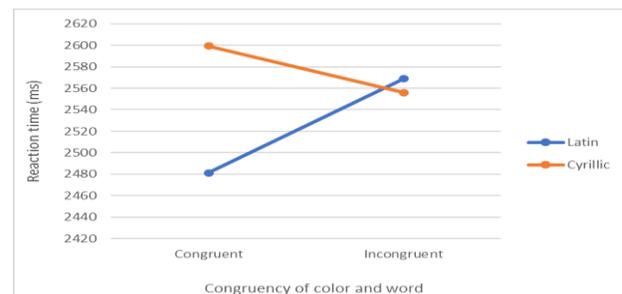
Figure 2: Reaction time in relation to alphabet and congruency in Stroop task

Discussion and Conclusion

The main goal of this research was to examine whether there is a difference in the Stroop effect when words written in different alphabets are used as stimuli. Namely, the Serbian language is characterized by the equal use of two systems, which is called bialphabetism or synchronous digraphy. There are studies that show certain differences in the processing of Latin and Cyrillic words (Vejnović, Jovanović, 2012; Vejnović, Dimitrijević, & Zdravković, 2011). The explanations for these differences were different, from the order of learning and more frequent exposure to one letter, to the visual characteristic of letters. The Stroop task enables the

examination of the relationship between orthographic structure and the reading process, and has also been used to examine the differences between different writing systems based on perceptual characteristics. The Stroop effect implies that words written in an incongruent color are processed more slowly due to the interference of two processes - reading the word and naming the color.

The results of this research show that this effect exists with Latin words. However, no inhibitory effect of incongruence was found for Cyrillic words. The Stroop effect is explained by the automatic reading hypothesis. Reading is a fast, automatic process that requires minimal cognitive engagement. However, if a conflict occurs between the two sources of information, then a greater investment is required to overcome these differences (Moors & Houwer, 2006). Our results are consistent with earlier research showing that one form of the Cyrillic script is more complex in terms of visual features compared to Latin (Verhoeven & Perfetti, 2021) and that a more complex visual identity is negatively correlated with efficient letter identification and therefore reading (Pelli, Burns, Farell, & Moore-Page, 2006). Such findings can explain the results of this research in a way that the complexity of the Cyrillic letters requires a greater engagement of attention, and has a different effect on the interference of reading and color naming. The obtained results should be checked in relation to certain perceptual variations of the letters in the two writing systems, such as letter size or font, as well as in relation to the acquisition order.

References

Botvinick, M.M., Braver, T.S., Barch, D.M., Carter, C.S., & Cohen, J.D. (2001). Conflict monitoring and cognitive control. *Psychological Review*, *108*, 624-652.

Fang, S., Tzeng, O. J., & Alva, L. (1981). Intralanguage vs. interlanguage Stroop effects in two types of writing systems. *Memory & Cognition*, *9*(*6*), 609–617

Ivković, D. (2013). Pragmatics meets ideology: Digraphia and non-standard orthographic practices in Serbian online news forums. *Journal of Language and Politics*, *12*(*3*), 335–356.

Ivković, D. (2015). Jezički krajolik Srbije (prvi deo): Percepcija prisustva ćirilice i latinice u javnoj sferi (The linguistic landscape of Serbia (part one): Perceptions of alphabet presence in the public sphere. *Antropologija, 15*(*2*), 87–110.

Jacoby, L.L., Lindsay, D.S., & Hessels, S. (2003). Item-specific control of automatic processes: Stroop process dissociations. *Psychonomic Bulletin & Review*, *10*, 634-644.

Kessler, B., & Treiman, R. (2015). Writing systems: Their properties and implications for reading. In A. Pollatsek & R. Treiman (Eds.), *The Oxford handbook of reading* (pp. 10–25). Oxford University Press.

Kostić, A. (2006). *Kognitivna psihologija*. Beograd, RS: Zavod za udžbenike i nastavna sredstva.

Levitt, J., Nakakita, M., & Katz, W. (2015). Role of phonology in reading: A Stroop effect case report with Japanese scripts. *Studies in Literature and Language*, *10*(*3*), 1-6.

Li, X., Huang, L., Yao, P., & Hyona, J. (2022). Universal and specific reading mechanisms across different writing systems. *Nature Review Psychology, 1*, 133–144 .

Lowe, D.G., & Mitterer, J.O. (1982). Selective and divided attention in a Stroop task. *Canadian Journal od Psychology*, *36*, 684-700.

Lukatela, G., Savić, M., Gligorijević, B., Ognjenović, P., & Turvey, M. T. (1978). Bi-alphabetical lexical decision. *Language and Speech*, *21*(*2*), 142-165.

Lukatela, G., & Turvey, M. T. (1998). Reading in two alphabets. *American Psychologist*, *53*(*9*),1057.

MacLeod, C. (2015). *The Stroop effect*. Encyclopedia of Color Science and Technology

Moors, A., & De Houwer, J. (2006). Automaticity: A Theoretical and Conceptual Analysis. *Psychological Bulletin*, *132*(*2*), 297–326.

Parris, B.A., Hassim, N., Wadsley, M., Augustinova, M., & Ferrand, L. (2022). The loci of Stroop effects: a critical review of methods and evidence for levels of processing contribution to color-word Stroop effects and the implications for the loci of attentional selection. *Psychological Research*, *86*, 1029-1053.

Pelli, D. G., Burns, C. W., Farell, B., & Moore-Page, D. C. (2006). Feature detection and letter identification. *Vision Research, 46*(*28*), 4646–4674.

Sampson, G. (1985). *Writing systems: A linguistic introduction*. Stanford, CA: Stanford University Press.Vejnović, D., Jovanović, T. (2012). Reading sentences in Serbian: Effects of alphabet and reading mode in self-paced task. *Psihologija*, *45* (*4*), 361-376.

Vejnović, D., Dimitrijević, S. & Zdravković, S. (2011). Oblast imenovanja ćiriličnih i latiničnih reči: novi nalazi. Empirijska istraživanja u psihologiji, XVII NAUČNI SKUP. Institut za psihologiju i Laboratorija za eksperimentalnu psihologiju, Filozofski fakultet, Univerzitet u Beogradu.

Verhoeven, L., & Perfetti, C. (2022) Universals in Learning to Read Across Languages and Writing Systems. *Scientific Studies of Reading*, *26*(*2*), 150-164.

The Effect of Color, Expectation and Gender on Sweet Taste Perception

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Abstract

Color has great importance in creating certain associations in terms of acceptance or rejection of a food product. Research has also shown that respondents most often associate red with a sweet taste and yellow with a sour taste. The aim of this research was to determine whether the taste sensation changes when the intensity of the red color changes. In addition to the visual characteristics of the stimulation, the influence of the "internal" cognitive factor - expectation and gender on gustatory perception was also examined. Three factors were varied: intensity of the red color (dark and light shade), expectation defined by the instruction given to the subjects (instruction that suggests the taste of sweet and "neutral instruction") and gender (male and female). The sample consisted of 100 subjects, with an equal number of males and females. The results showed that there is a statistically significant interaction between color and gender in taste assessment. Female participants rated the drink that had a more intense red color as sweeter. There was no statistically significant effect of cognitive factor (expectation) on taste sensation. The obtained results indicate important psychological determinants of taste perception.

Keywords: color, expectation, gender, taste perception

Introduction

The sense of taste represents one of the basic biological channels of knowledge (Ognjenović, 2002). The main task of this sense is to provide important information about food (whether it is edible or poisonous), but on the other hand, it is also a source of pleasure (Zdravković, 2008). Although the gustatory perception refers to the perception of basic tastes, it is also related to other components. Thus, the gustatory perception can be influenced by the smell of food and drink, as well as the color of the product itself, but also the sound with which the product is prepared. These components give the overall experience of food and drink (Spence, 2015). Gustatory perception can also be influenced by the state of the organism, as well as immediate experience.

Visual characteristics such as color, shape and size are important determinants when choosing food products. Color is the most important sensory cue for a product when it comes to setting people's expectations about the taste of food and drink (Spence, 2015). The use of food coloring is common, and therefore can have certain effects on the consumers themselves. Different colors affect customer behavior in different ways. Various psychological effects of food colors have been shown. Some of them are effects on the sensory thresholds of some basic tastes (Maga, 1974), then the creation of product taste associations and its attractiveness, their influence on the choice and consumption of food, etc. (Spence, 2015). In a recent study, it was determined that red

and orange were rated as the sweetest, white as the healthiest color, and yellow as the most acidic color (Hopppu et al., 2018). Accordingly, we assumed that this research will show the influence of color on gustatory perception, where more intense colors were considered sweeter and artificial

In addition to the visual characteristics of stimulation, our perception is also largely influenced by cognitive factors. One of these factors is expectation. The expectation is defined as a state of mind that is a consequence of prior information about what is likely or possible in the upcoming sensory environment (Summerfield & Egner, 2002). Expectation facilitates but also shapes perception, because it narrows the reference "sensory frame" and the subject focuses on the desired interpretation of input information.. In the literature, there are several attempts to explain the relationship between expectations and gustatory perception. One explanation is that expectation and taste cues are linked together based on prior experience (Epstein, 1977; Woods et al., 2010). Another explanation uses the assimilation-contrast model which includes an affective component (Cardello, 2007). If the previous gustatory sensations were pleasant, such experiences are remembered and assimilated into the appropriate scheme with which new sensations are compared. The same author further states that two types of expectations can be distinguished – *sensory* based and *hedonic* or *affective* based expectations. Sensory-based expectations refer to the beliefs that the product will possess certain sensory attributes at specific intensities. The second type of expectation refers to the belief that a product will be liked/disliked to a certain degree (Cardello, 2007).

Previous research has shown that the color of the product has great importance in creating certain associations in terms of accepting or rejecting the product (Hoppu et al., 2018; Piqueras-Fiszman et al., 2012; Spence, 2015). Research has also shown that respondents most often associate red with a sweet taste and yellow with sour (O'Mahony, 1983). However, although experiments have monitored the effects of specific colors on perceived flavor intensity, few studies have examined the effect of varying color intensity on a taste sensation. In this research, the focus was precisely on the analysis of the influence of intensity, i.e. color shade on taste perception. Given that empirical findings have consistently shown the existence of an association between the color red and sweet taste, the aim of this work was to determine whether the taste sensation changes when the intensity of the red color changes. In addition to the visual characteristics of the stimulation, the influence of the "internal cognitive factor - expectations on perception within the gustatory sensory

modality" was examined. We also wanted to check whether there are gender differences in the assessment of taste depending on the color or expectations, because previous research has shown that there is a difference in taste-guided behavior between males and females (Bartoshuk, Duffy, & Miller, 1994; da Silva et al., 2014). Females had more accurate sensory perception. This research confirmed gender differences because female participants rated the drink that had a more intense red color as sweeter.

Method

Sample

The research sample consisted of students of the University of Banja Luka, aged 19 to 25. One hundred participants, equally distributed by gender participated in the experiment.

Design and Procedure

This is an experiment with three independent variables: intensity of the red color (dark and light), expectation defined by the instruction given to the subjects (instruction that suggests the taste of sweet and "neutral instruction") and gender (male and female). The dependent variable was an estimate of the intensity of sweetness defined by a value on a seven-point scale.

A drink without any smell or taste was used - water colored with food coloring. The drink was placed in transparent cups so that appropriate visual information was available to the subjects. There were two intensities of red: darker (more intense red) and lighter (less intense red), which were obtained by different concentrations of added food coloring. The subjects' task was to judge the taste of the drink they tasted. One group was instructed to judge the "sweetness" of the taste, while another group was instructed to judge the taste (without the term "sweet"). Darker and lighter drinks were evaluated in both groups. The subjects rated the taste on the answer sheet by choosing a number on a scale from 1 to 7, where 1 means "not at all sweet", while 7 means "very sweet".

Results

The results of the analysis of variance did not show a statistically significant effect of color, gender or expectation on the evaluation of the sweetness of the beverage. A statistically significant interaction of gender and color on taste sensation was confirmed ($F(1,100) = 4.52$; $p < .05$; $\eta^2 = .047$). This interaction explains 4.7% of the variance of the dependent variable, which is a low effect according to Cohen's classification (Cohen, 1988). Female respondents rated the drink that had a more intense red color (darker shade) as sweeter, while the results showed the opposite for male respondents. They considered a drink with a lower intensity of red (light) to be sweeter. The results are shown in Figure 1.
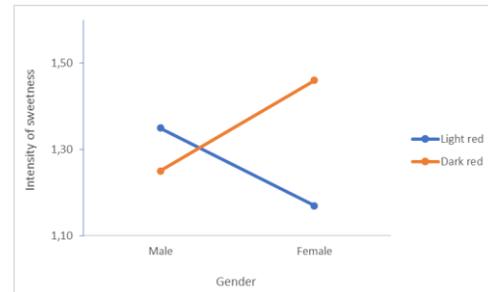
Figure 1. Graphical representation of the statistically significant interaction between gender and color

Discussion and Conclusion

The goal of this research was to examine the influence of color intensity as a visual factor and expectations as a cognitive factor on gustatory perception. We chose the red color because research shows that people most often associate it with a sweet taste (O'Mahony, 1983). Based on earlier research that showed the influence of color on gustatory perception, where more intense colors were considered sweeter and artificial (Clysdale et al., 1992; Johnson & Clysdale, 1982; O'Mahony, 1983) we assumed that similar results would be obtained in this research. But the statistical analysis did not confirm the initial assumption. The effect of color was not statistically significant. In addition, the obtained results did not show significant effect of expectation (instruction received during the research) on taste perception. The obtained results showed that there is only statistically significant interaction between color and gender in the assessment of taste. The female subjects rated the drink that had a more intense red color (dark shade) as sweeter, while the results showed the opposite for male subjects. The obtained result partially confirms the hypothesis that assumed that women evaluate the dark red drink as sweeter compared to men, which is in line with research indicating gender differences in taste sensation (Bartoshuk, Duffy & Miller, 1994; da Silva et al., 2014; & Hoppu et al., 2018). The opposite results were obtained for males. They rated lighter drinks as sweeter. The results are in accordance with earlier research, wchich assumed that women perceived more intense drinks as sweeter (Hoppu et al., 2018). Also, men may had different expection. It could be related to earlier sensory based experiences if they drank sweeter less intense drinks before.

Although certain differences in gustatory perception were obtained in the research in relation to the color of the drink and the gender of the participants, other characteristics that could be significant, such as age, body mass index or personal preferences, should be taken into account in subsequent research.

References

Bartoshuk, L.M., Duffy, V.B., Miller, I.J. (1994). PTC/PROP tasting: Anatomy, psychophysics, and sex effects. *Physiology & Behavior*, 56(6), 1165-1171.

Cardello, A. V. (2007) Measuring consumer expectations to improve food product development. In H. J. Macfie (Ed.), *Consumer-led food product development* (pp.223-261). Cambridge: Woodhead publishing.

Clydesdale,. F. M., Gover, R., & Fugardi, C. (1992). The Effect of Color on Thirst Quenching, Sweetnes, Acceptability and Flavor Intensity in Fruit Punch Flavored Beverages. *Journal of Food Quality*, *15*(1), 19-38.

Da Silva, L., Lin, S., Teixeira, M., De Siqueira, J. Filho, J. W., De Siqueira, S. (2014). Sensorial differences according to sex and ages. *Oral Diseases*, *20*(3), 103-110.

Epstein, W. (1977) Historical introduction to the constancies. In:Epstein, W. (Ed) *Stability and constancy in visual perception.(*1-22). London: Wiley.

Hoppu, U., Puputti, S., Aisala, H., Laaksonen, O., & Sandell, M. (2018). Individual Differences in the Perception of Color Solutions. *Foods*, *7*(9), 1-8. https://doi.org/10.3390/foods7090154

Johnson, J., & Clydesdale, F.M. (1982). Perceived sweetness and redness in colored sucrose solutions. *Journal of Food Quality*, *47*(*3*), 747-752.

Maga, J. A. (1974). Influence of color on taste thresholds. *Chemical Senses*, *1*(1), 115-119. https://doi.org/10.1093/chemse/1.1.115

Moran, A., & Toner, J. (2017). *A critical introduction to sport psychology* (3rd ed.). Routledge.

Ognjenović, P. (2002). *Psihologija opažanja*. Beograd: Zavod za udžbenike i nastavna sredstva.

O'Mahony, M. (1983). Gustatory responses to nongustatory stimuli. *Perception, 12*(5), 627–633.

Piqueras-Fiszman, B., Alcaide, J., Roura, E., & Spence, C. (2012).Is it the plate or is it the food? Assessing the influence of the color (black or white) and shape of the plate on the perception of the food placed on it. *Food quality and Preference*, 24 (1), 205-211.

Spence, C. (2015). On the psychological impact of food colour. *Flavour, 4*(21). https://doi.org/10.1186/s13411-015-0031-3

Summerfield, C. & Egner, T. (2009). Expectation (and attention) in visual cognition. *Trends in Cognitive Sciences*, *13*, 403-409.

Woods, A.T., Poliakof, E., Lloyd, D., Dijksterhuis, G.B., & Tomas, A. (2010). Flavor Expectation: The Effect of Assuming Homogeneity on Drink Perception. *Chemosensory Perception*, *3*(*3*), 174-181.

Zdravković, S. (2008). *Percepcija*. Zrenjanin: Sekretarijat za obrazovanje i kulturu AP Vojvodine.

Towards an Accessible Assessment of Reasoning: The Relation of Statistical Reasoning and Classic Reasoning Task Performance

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Abstract

Classic reasoning tasks regularly require computerised administration, tight experimental control and are overall not accessible to researchers outside the field. While there have been attempts to develop reasoning assessments, these have resulted in comprehensive yet difficult to implement instruments. This study is part of a project with the aim of determining which key factors need to be covered in such an instrument, while being easily administered and accessible. Modified versions of three standard reasoning tasks (the Base Rate neglect task, the Linda problem and the Covariation detection task) were conducted alongside the test of statistical reasoning in order to assess how performance on the tasks and the test relate. The study was conducted in two countries (Croatia and the UK) and languages. Quite a robust relation between performance in the reasoning tasks and on the test were observed in both samples. We can conclude that one factor which needs to be a part of the full reasoning assessment has to cover statistical reasoning as it is robustly related to overall reasoning performance.

Keywords: dual-process theory; reasoning; statistical reasoning; probabilistic reasoning; rationality

Introduction

Modern dual-process models of reasoning posit that there are multiple different Type 1 processes (DeNeys 2012; Glockner & Witteman, 2010; Pennycook et al., 2015). These can be heuristics such as availability or representativeness, which are traditional Type 1 processes, but also include logical intuitions, probabilistic heuristics and others which have traditionally been defined as Type 2. Tasks may cue multiple Type 1 processes to produce responses. If there is conflict, and it is detected, between Type 1 responses, then Type 2 processing is required to resolve it (Dujmović & Valerjev, 2018; Pennycook et al., 2015). The resolution of conflict may result in accepting the dominant response, cognitive decoupling in favour of an alternative, or abandoning all Type 1 responses in favour of more analytical processing.

The tasks developed to probe these processes usually require careful measurement in a computerized laboratory and quite a labour-intensive process of developing batteries of items. Stanovich, West, and Toplak (2016) have done extensive work in an attempt to develop measures of rationality. Their work resulted in the Comprehensive Assessment of Rational Thinking (CART). The key word being *comprehensive*, the assessment many factors which have been identified as components of rational thought but is not as focused is too large to administer for most researchers.

The overall goal of this process is to develop a compact reasoning assessment instrument from the perspective of modern dual-process models, while being accessible to researchers outside the field. The aim of this particular study is to determine whether a measure of statistical reasoning, which mostly measures probabilistic reasoning, shows robust and significant relationships with performance on a number of tasks usually used in reasoning research. These tasks routinely include judgments of probability, or simply require probabilistic reasoning in order to provide a normatively correct response. It was expected that all of the tasks used in the current study would correlate with the aforementioned measure.

Method

Participants

Participants were recruited from the UK (*N*=298) and from Croatia (*N*=292). Samples were equalised by gender ratio (71.19% female), urban to rural residence ratio (12.38% rural, 8.81% small town, 78.81% urban), age (*M*=31.42) and highest achieved education level (46.78% high school, 29.66 undergraduate, 23.56% graduate or higher).

Materials

Reasoning tasks

Three tasks adhere to a similar structure where one response to the problem can be made based on what would be normatively correct, and another can be made based on a heuristic.

The first of these is the modified base rate neglect task (BR task) which we further modified (DeNeys & Glumicic, 2008; Dujmović & Valerjev, 2018). The task can be seen in Figure 1. In this task the response can be made either based on the mathematical probability or based on the stereotype. Participants gave estimates of both populations being extroverted and sociable, then they gave probability estimates for each of the two responses.

Figure 1: Example of a modified base rate neglect task

Information about groups

Imagine a group of people consisted of 993 mathematicians and 7 hospitality workers (bartenders, hotel receptionists etc.).

Information about a randomly chosen person

One person is chosen at random from that group of 1000 people.

The person turns out to be very sociable and extroverted.

Assessment of probability

It's most probable that the randomly chosen person is:
a) a mathematician
b) a hospitality worker

Based on these four estimates, a bias score towards heuristic reasoning was calculated (equations (1) and (2)).

$$p(A) = \frac{p(char.A) * N(A)}{p(char.A) * N(A) + p(char.B) * N(B)} \quad (1)$$

$$Bias = estimated(A) - p(A) \quad (2)$$

For example, a participant gave the estimate that only 5% of all mathematicians are sociable and extroverted (*p(char.A)* in (1)), but 90% of hospitality workers have those traits (*p(char.B)* in (1)). Given that there are 993 mathematicians (*N(A)* in (1)) and 7 hospitality workers (*N(B)* in (1)), *p(A)* in (1) represents the correct probability estimate for a randomly chosen person to be a mathematician by the particular participant. In this case that would have been 88.74%. If the participant estimated the probability of a person being a mathematician to be 70% (*estimated(A)* in (2)) – then the bias is 18.74%. This means that the participant was swayed by the stereotype and the difference in how the traits are distributed for mathematicians and hospitality workers. Even though this participant is ascribing a higher probability to the person being a mathematician, the estimate is sub-optimal. This has the advantage of measuring bias even when participants give a categorically correct response (higher probability for the person being from the appropriate group). The resulting measure is a continuous variable even when based on one or a small number of tasks.

The second reasoning task was a modified version of the Linda problem (Dujmović et al., 2021). In the classic task people overestimate the probability of the conjunction of two occurrences. The classic task can be seen in Figure 2. Participants were asked to give independent probability estimates for both individual occurrences, and their conjunction.

Figure 2: Classic Linda problem

Vignette about person

Linda is 31 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations.

Probability assessment

Which is more probable?

a) Linda is a bank teller.
b) Linda is a bank teller and is active in the feminist movement.

Based on the estimates, a bias towards the conjunction fallacy was calculated (equations (3) and (4)).

$$p(A\&B) = p(A) * p(B) \quad (3)$$

$$Bias = estimated(A\&B) - p(A\&B) \quad (4)$$

For example, if a participant estimates that the probability of Linda being a bank teller is 25% (*p(A)* in (3)), and the probability of Linda being active in the feminist movement is 70% (*p(B)* in (3)), then the correct probability of the conjunction is 17.5% (*p(A&B)* in (3)). If the participant estimated that the probability of the conjunction was 60% (*estimated(A&B)* in (4)), then the bias is equal to 42.5%. This means that the participant is estimating the conjunction to be more probable than it actually is and the level of inaccuracy is measured as the bias.

The final reasoning task is the covariation detection task (Valerjev & Dujmović, 2019). The task can be seen in Figure 3. The bias towards high frequencies, rather than processing ratios, would lead participants to conclude that positive outcomes are more correlated with administering of the vaccine, while the correct response would be that the positive outcomes are negatively correlated with administering the vaccine (responses were given on a -3 to 3 Likert scale).

The modified CRT
The cognitive reflection test (Fredrick, 2005) is well known and widely used for research into human rationality. The prototypical example of a CRT item is the *bat and ball* problem shown below.

A bat and a ball cost 1.10 $ in total.
The bat costs 1.00 $ more than the ball.
How much does the ball cost?

In this study we used a modified version consisting of four items. Each item had four possible responses one of which was the correct response (analytical), one of which was the quick but incorrect response (heuristic), and two fillers (Valerjev, 2020).

Figure 3: The Covariation detection task
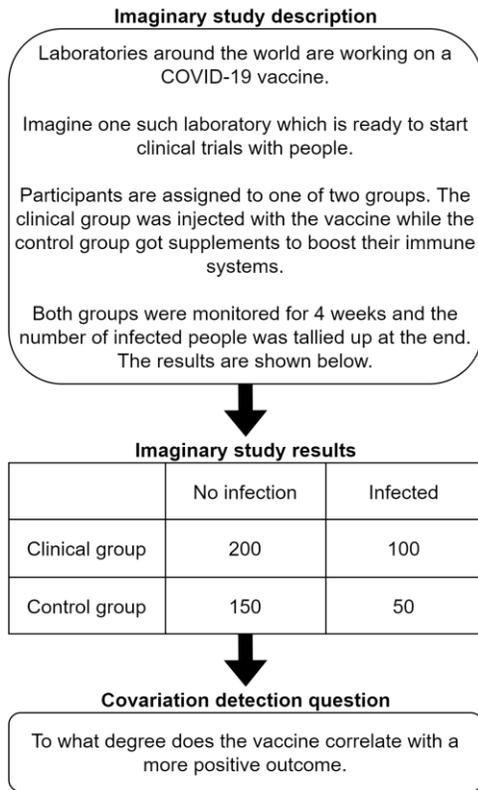
The TSR
The Test of statistical reasoning (Rapan & Valerjev, 2020; 2021) is the first stage at developing a measure which could correlate well with reasoning tasks. An example from the TSR can be seen below.

A box contains 4 white, 6 blue, and 8 black balls. A single ball is drawn. What is the probability that the ball is blue?

The test consisted of eleven time-limited (45 seconds per item) 4-alternative forced-choice tasks.

Procedure

Participants completed the study via PsyToolkit (Stoet, 2010; 2017). Participants completed the CRT followed by the BR task, the Linda problem, Covariation detection and the TSR. The order was the same for each participant, but the order of items/estimates within each task was randomized. Each estimate/item was presented independently.
    Scores on the CRT and TSR for each participant were calculated as the sum of correct responses. In the BR task and

the Linda problem, the scores were calculated as a bias towards heuristic thinking. Finally, the detection of covariation task scores mapped to a 1-7 scale where higher results indicate higher bias towards heuristic thinking.

Results

Descriptive statistics can be seen in Table 1.

Table 1: Descriptive statistics for the measures

Measure	M	SD	Skewness	Kurtosis
CRT	1.94	1.25	0.04	-0.99
BR bias	19.66	28.91	0.76	1.01
Linda bias	11.86	20.78	1.24	1.94
Covariation detection	3.80	1.59	-0.18	-0.85
TSR	7.07	2.15	-0.29	-0.49

To determine how well the CRT and reasoning tasks predict scores on the TSR – two regression analyses were conducted on the overall and both national samples (Table 2).

Table 2: Regression analyses of TSR scores as the criterion and reasoning measures as predictors

UK sample			
Predictor	r	β	t
CRT	.46	.33	6.44**
BR bias	-.31	-.14	2.68**
Linda bias	-.39	-.27	5.35**
Covariation detection	-.29	-.14	2.81**
$R = .58$; $R^2 = .34$; $R_{adj}^2 = .33$; $F(4, 290) = 37.27**$			
Croatian sample			
CRT	.37	.28	4.59**
BR bias	-.26	-.18	3.30**
Linda bias	-.17	-.12	2.17*
Covariation detection	-.28	-.24	4.59**
$R = .49$; $R^2 = .24$; $R_{adj}^2 = .23$; $F(4, 284,) = 22.15**$			
Combined sample			
CRT	.42	.31	8.21**
BR bias	-.27	-.16	4.46**
Linda bias	-.30	-.19	5.36**
Covariation detection	-.29	-.20	5.47**
$R = 54.$; $R^2 = 29.$; $R_{adj}^2 = .28$; $F(4, 579) = 58.44**$			

*$p < .05$; **$p < .001$

The regression analyses show that all of the tasks are significant predictors for TSR scores in both samples. The patterns of results were similar for samples from both countries apart from bias on the Linda problem being better correlated with TSR scores in the Croatian sample. This seems to be due to the Croatian sample having more participants who underwent at least some statistics training which considerably decreases Linda bias and the correlation with TSR.

Discussion

The study aimed to determine what is the relation between a measure of statistical reasoning and performance on classic reasoning tasks. Results showed a robust relationship both when analysing overall data and national samples independently. The relationships reported in the results are expected given that reasoning tasks routinely include aspects of probabilistic reasoning which is what the TSR primarily measures.

The variance reasoning measures explain in the TSR scores is promising for future work, though some reservations should be taken into consideration. First, this version of the TSR was time-limited which routinely results in settling for the dominant Type 1 response. Since incentivising Type 1 reasoning is common to reasoning tasks, the time-limit may be a key factor, resulting in stronger relationships. Second, the shared computerised method of administering both the reasoning tasks and the TSR contributes to the strength of the relations. It is important to investigate whether the results generalize to other settings. Finally, reasoning tasks were limited to one problem per task. Sets of items have been developed and will be administered as batteries in the future.

The end goal of this research is to develop a measure which will be available and easy to administer to researchers across different fields rather than the current tasks which are mainly limited to a fairly small research community. Such a measure would potentially make reasoning and the dual-process approach more accessible and more wide-spread since heuristics and analytical processing are part of real-world reasoning, decision making and problem solving. Future steps include detecting other relevant factors that need to be a part of such an assessment, establishing that they indeed are related to performance in established reasoning tasks, creating a manageable, accessible, curtailed version of the assessment which will cover all the determined factors and validating the final version.

References

De Neys, W. (2012). Bias and conflict: A case for logical intuitions. *Perspectives on Psychological Science, 7*(1), 28-38.

De Neys, W., & Glumicic, T. (2008). Conflict monitoring in dual process theories of thinking. *Cognition, 106*, 1248-1299.

Dujmović, M., & Valerjev, P. (2018). The influence of conflict monitoring on meta-reasoning and response times in a base rate task. *Quarterly Journal of Experimental Psychology, 71*(12), 2548–2561.

Dujmović, M., Valerjev, P., & Bajšanski, I. (2021). The role of representativeness in reasoning and metacognitive processes: an in-depth analysis of the Linda problem. *Thinking and Reasoning, 27*(2), 161-186.

Frederick, S. (2005). Cognitive reflection and decision making. *Journal of Economic Perspectives, 19*, 25–42.

Glockner, A., & Witteman, C. (2010). Beyond dual-process models: A categorization of processes underlying intuitive judgment and decision making. *Thinking & Reasoning, 16*(1), 1-25.

Pennycook, G., Fugelsang, J.A. & Koehler, D.J. (2015). What makes us think? A three-stage dual-process model of analytic engagement. *Cognitive Psychology, 80*, 34-72.

Rapan, K., & Valerjev, P. (2020). Test statističkog rasuđivanja [Test of statistical reasoning]. In V.Ć. Adorić, I. Burić, I. Macuka, M. Nikolić Ivanišević, & A. Slišković (Eds.), *Zbirka psihologijskih skala i upitnika - Svezak 10* [*Collection of psychological scales and questionnaires – Volume 10*], (pp. 103-112), Zadar: University of Zadar.

Rapan, K., & Valerjev, P. (2021). Is automation of statistical reasoning a suitable mindware in a base-rate neglect task? *Psychological Topics, 30*(3), 447-466.

Stanovich, K., West, R., & Toplak, M. (2016). *The rationality quotient: Toward a test of rational thinking.* Cambridge: MIT press.

Stoet, G. (2017). PsyToolkit: A novel web-based method for running online questionnaires and reaction-time experiments. *Teaching of Psychology, 44*(1), 24-31

Stoet, G. (2010). PsyToolkit - A software package for programming psychological experiments using Linux. *Behavior Research Methods, 42*(4), 1096-1104.

Valerjev, P., & Dujmović, M. (2019). Performance and metacognition in scientific reasoning; The covariation detection task. *Psychological Topics, 28*(1), 93-113.

Valerjev, P. (2020). Chronometry and meta-reasoning in a modified Cognitive Reflection Test. In K. Damnjanović, O. Tošković, & S. Marković (Eds.), *Proceedings of the XXV Scientific Conference Empirical Studies in Psychology* (pp. 31-34). Belgrade: Institute of Psychology, Laboratory for Experimental Psychology, Faculty of Philosophy, University of Belgrade.

CLINICAL PSYCHOLOGY

Factor Structure and Psychometric Properties of the Croatian Version of the Information Technology Anxiety Scale in a Student Sample

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Abstract

This paper aimed to translate and adapt the Information technology anxiety scale (López-Bonilla and López-Bonilla, 2012) into Croatian and check the factor structure of the scale and metric characteristics of a Croatian student sample. An exploratory factor analysis was performed using the maximum likelihood method. According to the Kaiser - Guttman criterion, the existence of one factor with a characteristic root greater than one was determined. All items had satisfactorily high saturations with extracted factor, except for the 7thitem. The 7th item was removed from the scale and an exploratory factor analysis was performed again. Again, the existence of one was determined. This factor explained 54.5% of the variance of the scale results. All items had high saturation with the factor. The scale showed high reliability. 75% of the theoretical range was covered in this sample. Kolmogorov-Smirnov test found that the results differ from the normal distribution, but the measures of skewness and kurtosis were within the allowable range according to Kline's (2011) criterion. It can be concluded that the scale of information technology anxiety has good metric characteristics in a sample of Croatian students. Additionally, the scale possesses a factor structure and psychometric properties comparable to the original version of the scale.

Keywords: anxiety; factor structure; information technology; information technology anxiety scale

Introduction

The development of new IT has led to a series of changes in people's daily lives. Along with many positive aspects of such rapid changes, there are of course also negative ones, and one of them is anxiety toward IT.

Woodrow (1991) states that if IT technology serves as a learning and teaching tool, it is necessary to constantly monitor users' attitudes about these technologies to take timely and effective measures to optimize the use of IT technology. This author believes that such measures should be short, efficient, and easily applicable to different samples. In the last decade, the development of new IT has led to the construction of measuring scales adapted to new technologies such as the Internet. However, there are surprisingly few measurement scales targeting IT-related anxiety.

Therefore, the authors López-Bonilla and López-Bonilla (2012) proposed a measurement scale that measures this construct. The scale was validated on a convenient student sample. Given that the scale was not used in Croatian samples before, the main goal of this study was to adapt and translate the scale into the Croatian language. The scale was translated from English to Croatian by two independent translators. Translators were students from the Department of English at the University of Zadar. The discrepancies between them were resolved among them. This version was then back-translated to English by a bilingual psychology graduate. The scale was also adapted in two categories: instruction alteration and response scale alteration. In the first category, participants weren't asked to evaluate their information technology anxiety *per se*, but rather in the last semester of college. Regarding the response scale alterations, in the study by Lopez-Bonilla and Lopez-Bonilla (2012), the participants answered on a 7-point Likert scale (1-strongly disagree, 7-strongly agree). In the previous agreement with the authors, a 5-point Likert scale was used in this research (1- do not agree at all, 5-completely agree) for the simpler and more common applications.

Method

Participants and procedure

147 students of the University of Zadar participated in the research, of which 70% were female. The age of the participants was expressed categorically, and the largest number of participants were between 21 and 23 years old (54.4%). The largest number of students were in the second year of undergraduate studies (31.3%).

The research was conducted online in June 2020, as part of wider research. The research was voluntary and anonymous.

Measures

Information technology anxiety scale

The scale proposed in the research by López-Bonilla and López-Bonilla (2012) is based on 12 statements. In the construction of the scale, two previously constructed and validated scales were used: The technology anxiety scale (Meuter et al., 2003) and the Computer attitude scale (Loyd and Gressard, 1984).

Data analysis

Factor structure was examined through exploratory factor analysis (EFA) in SPSS software (SPSS, v. 25) using theMaximumlikelihoodmethod. The criteria for the number of factors to be retained were the values of the characteristic root, which should be at least 1 (Kaiser-Guttman criterion), the percentage of explained variance that can be attributed to an individual factor, Catell's Scree test, and factor interpretability.

It was also checked whether the data meet the basic prerequisites for conducting factor analysis. Since the sum

value on the KMO test was 0.90 and Bartlett's test was statistically significant ($\chi2(66)= 4053.74, p<.01$) the factor analysis could be conducted.

Results

Factor analysis

According to the Kaiser-Guttman criterion, the existence of one factor with a characteristic root greater than one was determined (Table 2).All items had satisfactorily high saturations with the extracted factor (> .58), except for the 7[1] item[1] ("I don't feel threatened when others talk about IT), which can be seen in Table 2. Cattel's scree test was consistent with the obtained data and also indicated the existence of one factor.

Table 2: Factor loadings for one-factor exploratory factor analysis before and after removing the 7[1] item from the scale

Scale item	Factor 1	Factor 1*
	.682	.681
	.584	.582
	.763	.762
	.772	.771
	.601	.610
	.674	.674
	.01	/
	.641	.885
	.884	.899
	.898	.798
	.798	.754
	.754	.681
Eigenvalue (percentage of explained variance)	6.03(50.2)	6.02(54.7)

*Factor loadings for one-factor exploratory factor analysis after removing the 7[1] item from the scale

Given the low saturation of the 7[1] item with the factor (Table 2), this item was removed from the scale and the factor analysis was performed again. One factor with a characteristic root greater than one was established (Table 2).All items had satisfactorily high saturations with the extracted factor (> .58), which can also be seen in Table 2.

Distributional properties

As indicators of the normality of the distribution of summative results on the final version of the Information-Technology Anxiety scale, measures of skewness and kurtosis were taken, and the Kolmogorov-Smirnov test wasperformed. Although theKolmogorov-Smirnov test determined that the results differ from the normal distribution ($KS=.21$, $p<.01$),the measures of skewness

($zSK= 1.04$) and kurtosis ($zKu=.40$) are within the permissible range according to Kline's (2011) criterion (permissible range for both skewness and kurtosis is within -2 and +2). Considering this, and because the histogram appeared to show a normally distributed score, it is allowed to calculate the average result on the Information Technology Anxiety scale and the standard deviation of the results.

Descriptive statistics

After removing the 7[1] item from the scale, basic descriptive parameters were calculated for the 11-item scale solution. The obtained score of the scale, whose mean value is 17.85 (SD=8.08), where the theoretical minimum is 11, and the maximum of the scale is 55, shows that students demonstrate low levels of IT anxiety.

Reliability

The calculated Cronbach's alpha coefficient was 0.93, which indicates that the scale is highly reliable.

Discussion and Conclusion

The present study explored the factor structure of the Croatian version of the Information technology anxiety scale (ITAS) for students of the University of Zadar. Results from the EFA were suggestive of a one-factor structure. These results reflect the factorial structure found by Lopez Bonilla and Lopez Bonilla (2012). Only one scale item had to be removed from the scale due to extremely low factor loading (the item „I do not feel threatened when others talk about IT"). This item does not contribute to explaining the construct of information technology anxiety, at least among the sample of students from the University of Zadar, possibly due to its ambiguous wording.These results have been set on the shape of the definitive scale, composed of 11 items.Hence, thisscaleisshort, simple, reliable, efficient, and easy to administer, at least, to university students, but it is also worth mentioning that even though 75% of the theoretical range of results was covered within this sample, the scores obtained are on the lower side, indicating at least a slightly "easier" test (not too much IT anxiety). This is not surprising considering the fact that the research sample consisted of university students who use ICT on daily basis for college-related activities, and who, presumably, represent younger generations who are familiarized with such technologies from birth onwards.

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[1]For thescaleitemsinboth English and Croatian checkAppendix

References

Kline, R. B. (2011). Principles and practice of structural equation modeling (5th ed.). The Guilford Press.

López-Bonilla, J. M., & López-Bonilla, L. M. (2012). Validation of an information technology anxiety scale in undergraduates. British Journal of Educational Technology, 43(2), 56-58. https://doi.org/10.1111/j.1467-8535.2011.01256.x.

Loyd, B. H., & Gressard, C. P. (1985). The reliability and validity of an instrument for the assessment of computer attitudes. Educational and Psychological Measurement, 45 (4), 903–908.

Meuter, M. L., Ostrom, A. L., Bitner, M. J., & Roundtree, R. (2003). The influence of technology anxiety on consumer use and experiences with self-service technologies. Journal of Business Research, 56 (11), 899–906.

Woodrow, J. E. J. (1991). A comparison of four computer attitude scales. Journal of Educational Computing Research, 7, 165–187.

Appendix

Final scale items in English and Croatian

1. I feel apprehensive about using information technologies (ITs). / Plaši me korištenje tehnologije.

2. Technological information sounds like confusing jargon to me. / Informacijske tehnologije za mene su zbunjujući žargon.

3. I have avoided ITs because it is unfamiliar to me. / Izbjegavam koristiti informacijske tehnologije jer nisam dovoljno upoznat(a) s njima.

4. I hesitate to use ITs for fear of making mistakes I cannot correct. / Oklijevam koristiti informacijske tehnologije iz straha da ću napraviti pogreške koje neću moći ispraviti.

5. ITs do not scare me at all. / Informacijske tehnologije me uopće ne plaše.

6. Working with ITs would make me very nervous. / Rad s informacijskim tehnologijama čini me nervoznim/om.

8. I feel aggressive and hostile towards ITs. / Ponašam se agresivno I hostilno prema informacijskim tehnologijama.

9. ITs make me feel uncomfortable. / Informacijske tehnologije mi stvaraju neugodu.

10. I get a sinking feeling when I think of trying to use ITs. / Osjećam se loše kada pomislim na korištenje informacijskih tehnologija.

11. ITs make me feel uneasy. / Informacijske tehnologije me uznemerivaju.

12. ITs make me feel confused. / Informacijske tehnologije me zbunjuju.

Family Functioning and Negative Experiences in the Covid-19 Pandemic as Predictors of Subjective Wellbeing

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Abstract

This study aimed to investigate dimensions of family functioning and negative experiences during the Covid-19 pandemic as predictors of subjective wellbeing. The sample consisted of mothers, fathers and firstborn children from 87 families; 261 participants in total. Instruments: a socio-demographic questionnaire (income and general health issues as control variables, negative consequences of the Covid-19 pandemic, including infection, severe symptoms, and death in the family as well as job/income loss), the Family Adaptability and Cohesion Evaluation Scale (FACES IV) which measures eight dimensions of family functioning, the Scale of Positive and Negative Experience (SPANE) and the Personal Wellbeing Index (PWI) were used. To investigate the contribution of family functioning and negative pandemic consequences in predicting PWI and SPANE scores, regression analyses were conducted. Monthly income and general health issues were included as the first set of variables in all regression analyses. Results: Higher incidence of positive emotions was observed in cohesive as well as more rigid families, as well as in families whose members tend to be disengaged, while a higher prevalence of negative emotions was observed in more enmeshed and less disengaged families. Negative pandemic consequences were positively correlated with negative emotions, and negatively with positive ones.

Keywords: family functioning; Covid-19; subjective wellbeing; cohesion; flexibility

Introduction

Adequate family functioning affects healthy emotions, physical health and subjective wellbeing (Botha & Booysen, 2014; Dunst et al., 2021). One's greater wellbeing has been associated with family cohesion (Lelkes, 2006), familial support (Martin & Westerhoÿ, 2003) and strong family bonds (Alesina & Giuliano, 2010). Flexibility and adaptability in the family is important for crisis management as well (Botha & Booysen, 2014).

Research points to greater life satisfaction among those who believe that their family members show sincere care and that they may rely on family members when facing personal problems (Martin & Westerhof, 2003). Those living with family members under limited interaction have considerably lower life satisfaction (Lelkes, 2006). Research also suggests that healthy family relationships are positively linked with the subjective well-being of the family.

The uncertainty, stress and restrictions faced during the Covid-19 pandemic have had negative consequences on wellbeing (Dawel et al., 2020; Modersitzki et al., 2020; Yang et al., 2020) which were further compounded by demographic factors such as age, gender (specifically female), financial difficulties and chronic disease (Dawel et al., 2020) as well as other contextual factors, such as risk of infection (Yang et al. 2020). Fear of the coronavirus itself (Canady, 2000; Wang et al., 2020) is also associated with reduced life satisfaction, as one indicator of subjective well-being (Özmen et al., 2021). Most existing studies conducted during the pandemic have dealt with various aspects of individual functioning separated from the individual's social context, especially family functionality (Botha & Booysen, 2014). However, some research suggests that high family cohesion may possibly reduce negative psychological effects of the Covid-19 pandemic (Behar-Zusman et al., 2020). The goal of the present study was to fill the gap in existing research concerning the role of the family as a contributing factor to subjective wellbeing in crisis periods, such as the pandemic.

This study aims to investigate dimensions of family functioning and negative experience (e.g. infection, loss of income) during the Covid-19 pandemic as predictors of subjective wellbeing. As possible interfering variables, family income and existing chronic health problems are examined and controlled for. The study was conducted online, using Google Forms.

Method

Sample

The sample consisted of mothers (age- 33 to 61, M = 48.78, SD = 6.00), fathers (age- 35 to 71, M = 52.00, SD = 6.34) and firstborn children (M = 20.21, SD = 3.40; 73.5% female) from 87 families; 261 participants in total. The monthly family income for 7.4% was below 50k dinars, 24% between 50k and 100k, 36.3% between 100k and 150k, and 32.4% above 150k RSD. 75% reported having no chronic health problems, 23% one problem and 2% multiple such problems.

Instruments

Participants were administered a socio-demographic questionnaire on their monthly income and general health issues as well as negative consequences of the Covid-19 pandemic (severe symptoms, infections or deaths among themselves and family members, as well as job/income loss).

The Family Adaptability and Cohesion Evaluation Scale - IV (FACES-IV; Olson et al., 2011) is a self-report measure which is used to assess family cohesion and family flexibility (Olson, 2011). It consists of 62 items, with answers given on a 5-point Likert scale. It includes 8 subscales: balanced cohesion, balanced flexibility, unbalanced disengaged and unbalanced enmeshed (measuring dysfunctional low or high cohesion), unbalanced rigid and unbalanced chaotic (measuring dysfunctional low or high flexibility), communication and family satisfaction.

The Scale of Positive and Negative Experience (SPANE; Diener et al., 2009) is a survey measuring tendencies to positive and negative emotions which consists of two subscales (positive, negative) and 12 items answered on a 5-point Likert scale.

The Personal Wellbeing Index (PWI; The International Wellbeing Group, 2013) is a questionnaire measuring satisfaction of one's life according to one's living conditions, health, relationships and security. It comprises eight items answered on an 11-point Likert scale.

Results

A One-way ANOVA and a post-hoc Scheffe test for multiple comparisons found no significant differences in the variables studied between mothers, fathers and children, allowing for analyses conducted on the whole sample.

Initially, three regression analyses were run to investigate whether monthly income and chronic health problems are significant predictors of PWI, SPANE(+) and SPANE(-). The results showed only PWI to be significantly predicted ($R = .339$; $R^2 = .115$; $F_{(2, 259)} = 16.251$; $p < .001$) using both predictors: monthly income ($\beta = .247$, $p < .001$) and chronic health problems ($\beta = -.225$, $p < .001$). Regression coefficients for SPANE(+) and SPANE(-) as criteria variables weren't significant: $R^2 = .010$; $F_{(2, 259)} = 1.267$; $p = .283$; $R = .066$; $R^2 = .004$; $F_{(2, 259)} = .450$; $p = .638$, respectively.

To investigate the contribution of predictors (dimensions of family functioning and negative consequences related to the pandemic) in explaining subjective well-being (measured via PWI and SPANE), three regression analyses were conducted. As control variables, monthly income and general health issues were included as the first set of variables in all regression analyses.

In predicting PWI, the regression coefficients were significant: $R = .538$; $R^2 = .290$; R^2change = .175; $F_{(9, 252)}$ change = 6.638; $p < .001$. Only family satisfaction was a significant predictor: $\beta = .356$, $p < .001$.

In predicting SPANE(+), the following regression coefficients were significant: $R = .493$; $R^2 = .243$; R^2change = .233; $F_{(9, 252)}$ change = 8.276; $p < .001$, including the predictors: Balanced Cohesion ($\beta = .346$, $p = .015$); Unbalanced Disengaged ($\beta = .267$, $p = .007$); Unbalanced Rigid ($\beta = .161$, $p = .021$) and Negative pandemic experiences ($\beta = -.113$, $p = .049$)

In predicting SPANE(-), the following coefficients were significant = .450; $R^2 = .203$; R^2change = .199; $F_{(9, 252)}$ change = 5.726; $p < .001$ as well as the predictors: Unbalanced Enmeshed ($\beta = .241$, $p < .001$); Unbalanced Disengaged ($\beta = -.201$, $p = .044$); Negative pandemic experiences ($\beta = .160$, $p = .013$).

Discussion

As has been found in the literature, higher family income positively relates to subjective well-being while chronic health problems negatively relate to subjective well-being. Better family functioning and satisfaction positively relate to subjective well-being. More pandemic-related negative experiences relate negatively to subjective well-being indicators. Findings are broadly in agreement with the literature, indicating adequate family functioning is positively related to subjective well-being (Botha & Booysen, 2014; Dunst et al., 2021, Lelkes, 2006)

The association between unbalanced dimensions of family functioning and better wellbeing may seem paradoxical, yet is understandable through systemic family theory. It is explainable as being a function of maintaining the family system when satisfaction with family interrelations is low and by the specific dynamic of family functioning in a crisis. It has been already found that rigid and authoritarian systems in crisis conditions are more successful (Baumrind, 1972; Fiedler, 1967); harder material conditions are better handled in more authoritarian families (Hoff et al., 2002). It should be noted that our study is limited by its small sample, thereby not allowing for testing of moderating influences on family functioning.

Conclusion

The level of family cohesion has been shown to be a generally stronger predictor of positive and negative emotions than flexibility. The results of our study have once more demonstrated that family functioning is a protective factor in crises (Behar-Zusman et al., 2020).

References

Alesina, A., & Giuliano, P. (2010). The power of the family. *Journal of Economic Growth*, 15, 93–125

Baumrind, D. (1972). An exploratory study of socialization effects on black children: Some black-white comparisons. *Child Development*, *43*(1), 261. https://doi.org/10.2307/1127891

Behar-Zusman, V., Chavez, J. V. & Gattamorta, K. (2020). Developing a measure of the impact of COVID-19 social distancing on household conflict and cohesion. *Family Process*, 59(3), 1045-1059. doi: 10.1111/famp.12579

Botha, F., & Booysen, F. (2013). Family Functioning and Life Satisfaction and Happiness in South African Households. *Social Indicators Research*, *119*(1), 163-182. https://doi.org/10.1007/s11205-013-0485-6

Canady, V. A. (2020). APA poll finds nearly half anxious about getting COVID-19. *Mental Healthe Weakly, 30*(13), 5-5.

Dawel, A., Shou, Y., Smithson, M., Cherbuin, N., Banfield, M., & Calear, A. et al. (2020). The effect of COVID-19 on mental health and wellbeing in a representative sample of Australian Adults. *Frontiers In Psychiatry*, *11*. https://doi.org/10.3389/fpsyt.2020.579985

Diener, E., & Ryan, K. (2009). Subjective well-being: A general overview. *South African Journal Of Psychology*, *39*(4), 391-406.

Dunst, C. (2021). A meta-analytic investigation of the relationships between different dimensions of family strengths and personal and family well-being. *Journal Of Family Research*, *33*(1), 209-229. https://doi.org/10.20377/jfr-578

Fiedler, F. (1967). *A theory of leadership effectiveness* (1st ed.). McGraw Hill Text.

Hoff, E., Laursen, B.,Tardif T.ial. (2002). Socioeconomic status and parenting. In M. H. Bornstein (Ed.). *Handbook of parenting. Volume 2 Biology and ecology of parenting* (231-252). New Jersey: Lawrence Erlbaum associates, publishers.https://doi.org/10.1177/008124630903900402

Lelkes, O. (2006). Knowing what is good for you: Empirical analysis of personal preferences and the "objective good". *Journal of Socio-Economics*, 35, 285–307.

Martin, M., & Westerhof, G. J. (2003). Do you need to have them or should you believe you have them? Resources, their appraisal, and well-being in adulthood. *Journal of Adult Development*, 10(2), 99–112. Alesina, A., & Giuliano, P. (2010). The power of the family. *Journal of Economic Growth*, 15, 93–125

Modersitzki, N., Phan, L. V., Kuper, N., & Rauthmann, J. F. (2020). Who is impacted? Personality predicts individual differences in psychological consequences of the COVID-19 pandemic in Germany. *Social Psychological and Personality Science.* https://doi.org/10.1177/1948550620952576

Olson, D. H. (2011). Faces IV and the circumplex model: validation study. *Journal of marital & family therapy*, 37(1), 64–80. doi: 10.1111/j.1752-0606.2009.00175.x

Özmen, S., Özkan, O., Özer, Ö., & Yanardağ, M. Z. (2021). Investigation of COVID-19 fear, well-being and life satisfaction in Turkish society. *Social Work in Public Health.* https://doi.org/10.1080/19371918.2021.1877589

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health, 17*(5): 1729. doi:10.3390/ijerph17051729.

Yang, Haiyang, Ma, & Jingjing (2020). How an epidemic outbreak impacts happiness: Factors that worsen (vs. protect) emotional well-being during the coronavirus pandemic". *Psychiatry Research. 289: 113045.*

Different Impacts of Stressful Life Events on the Occurrence of Myocardial Infarction in Men and Women

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Abstract

Numerous life-changing occurrences might lead to discontinuity in life and the requirement for adaptation. This can provoke stress responses. Rare studies on the effects of life events on the likelihood of myocardial infarction suggest that various life events may have an impact on the occurrence of myocardial infarction. The purpose of this case-control study is to investigate if stressful life events differ in their prognostic value for myocardial infarction in men and women. There were 500 participants in the research, 200 of whom had myocardial infarctions, and 300 were healthy individuals. The Scale of Stressful Life Events was used in the study. This scale included 31 life events. The results showed that the model significantly differentiated both healthy men and women from those who had a myocardial infarction. Only four life events—marriage, childbirth, the spouse being extremely ill or harmed, and vacation—had substantial predictive value for males, compared to only one for women—vacation. It is concluded that stressful life events have a greater influence on the occurrence of infarction in men than in women and that different stressful events contribute differently to predicting the occurrence of myocardial infarction.

Keywords: Stress, Life events, Myocardial infarction, Gender differences.

Introduction

One of the most relevant health issues in past decades has been the recognition of risk factors for cardiovascular disease, their treatment, and prevention of cardiovascular disease. In addition to the traditional, few psychological, and psychosocial factors have been identified related to the incidence and progression of cardiovascular diseases (Denollet, Vrints, Conraads et al, 2008; Honig & Maes, 2000; Williams et al, 2008). A certain number of factors can be influenced, e.g. by changing behaviour (increasing physical activity, changing dietary habits, reducing BMI) or changing health status (e.g. hypertension, hyperlipidemia). Some other factors cannot be influenced (e.g. age, gender, race/ethnicity, genetic vulnerability). Some biological and behavioural factors that impact and moderate cardiovascular diseases are discovered, yet they cannot fully explain the incidence of cardiovascular incidents (about 75%) (Mejia-Lancheros, 2015). Despite modern diagnostic methods, progress in treatment, and the application of preventive measures, 58 million people die every year, of which over 17 million are from cardiovascular diseases, with as many as 7.2 million related to death due to myocardial infarction (MI) (WHO, 2018). By identifying psychological risk factors, further interventions would be enabled through the optimization of medical treatment, but also through other psychosocial and behavioural interventions.

Life events and myocardial infarction

Davison and Neale (2002, p.775) define stress as "the state of an organism exposed to a stressor" and stressor as an "event that causes stress in the organism". The research of life events began in 1919. The term "stressful life events" (SLE) became popular in the literature because of the adaptation they require from a person. Many studies (e.g., Biglari et al., 2016; Rahe, Biersner, Ryman, & Arthur, 1972) over the past 20 years have found modest but independent associations between life events and disease. On the other hand, several studies showed that stress, even when extremely high, can lead to positive outcomes, e.g. growth (Nelson and Simmons, 2003).

Cottington, Matthews, Talbott and Kuller (1980) found that women who died of MI were six times more likely to have experienced the death of a partner in the previous 6 months. Deljanin et al. (2007) determined that major financial problems, problems with the law, and severe illness of loved ones are the most significant risk factors for the onset of acute MI. Research results (Sibai, Fletcher & Armenian, 2001) showed a significantly increased risk of disease in women due to exposure to trauma that happened to them or their family, while in men the risk of illness was higher due to loss of property and job loss, especially when these men had a lower level of education.

Future research should answer the arising question - which life events affect the occurrence of MI in women and men? This research aims to determine which life events predict MI in men and women.

Method

The case-control study was conducted in the F BiH. The subjects were users of different health care institutions. Clinical group was consisted of MI survivors, and non-clinical of healthy subjects.

Sample

500 respondents aged 19 to 84 participated (54.9±12.5), of which 52.2% were men. There was no statistical difference between clinical (n=200) and non-clinical (n=300) sample in sociodemographic data.

Instruments

Life events list was constructed for this research. It consisted of 31 events that require an adjustment from an individual and are considered stressful. The respondents marked the life events they experienced in the past year.

Sociodemographic data (gender, age, marital and socio-economic status) were collected.

Results

To observe the different predictive contributions of life events in men and women, we separated the respondents according to gender and applied binary logistic regressions. We included 31 SLE as dichotomous predictor variables (happened/not happened in past year) and MI as a criterion variable (0 - healthy subjects, 1 - subjects with MI).

The model explains 30.8 - 41.4% of the variance in the development of MI in men and 20.5 - 28% in women.

The results showed that only four independent variables made a unique statistical contribution to the model in men (Table 1). The strongest predictor of MI is the birth of a child - respondents who experienced the birth of a child in the past year had MI 12.23 times more often. The second strongest predictor of MI is severe illness or injury of the partner - those subjects whose partner was seriously ill in the past year are even 3.42 times more likely to be in the group with MI. Two other significant predictors are Vacation and Wedding. Respondents who were on a vacation in the past year were about 0.20 times less likely to have a MI than those who were not on a vacation. Respondents who got married in the past year were 0.05 times less likely to have MI.

The results showed that only one independent variable Vacation) made a unique statistical contribution to the model in women. Respondents who had a vacation in the past year had MI 0.26 times less often.

In other words, two risk factors (birth of a child and severe illness or injury of the partner) and two protective factors (vacation and wedding) predict MI in men, but only one life event is a protective factor (Vacation) in women.

Discussion and Conclusion

Respondents were less likely for the occurrence of MI if they had vacation in the past year, which could be explained by recuperation – free time, more exercise, better sleep (Strauss-Blasche, 2005).

The strongest predictor of MI in males is the birth of a child. The possible explanation for the negative impact of this event on the father may lie in the fact that after the birth, the wife's attention is diverted from the man to the baby. Men also go through a major adjustment and stress

after the birth of a child, but dealing on his own and suppressing emotions. Unlike women, men continue to work after the birth of a child, taking on additional care for their wives and children. It is possible that they feel big financial pressure due to the child's needs. After birth some men take their wife's caretaker role.

Although earlier studies have shown the opposite, the results of our study suggest that a serious illness or injury of a partner is a significant predictor of MI in men but not women. A possible explanation is that men may have a harder time adapting to the changes that come with taking responsibility and caring for others. Namely, women are traditionally in the role of caregivers when it comes to their partner's health (Allen, 1994), as well as the health of children, and this may not require adjustment for women, unlike men who may find difficult to take caregiver role for a sick partner (Allen, 1994). According to this explanation, marriage was found to be a protective factor for MI in men in the first year after the marriage. Women may find the caregiver role rewarding instead stressful (Norton, et al., 2002). The role of social support and sense of belonging (Alizadeh et al., 2018) may explain the gender differences – women seek for support more but also perceive more social support when dealing with stress (Van Droogenbroeck, Spruyt, & Keppens, 2018; Zhang et al., 2018). Also, in our culture women more frequently then men use prayer as coping strategy (Radulović, 2010). This may partially explain insignificant relations between life events and MI in women in our sample (Masters, Emerson, & Hookers, 2022; Radionov, 2022).

We can conclude that different factors of SLE in men and women have a distinct predictive contribution to the development of MI. Birth of a child and severe illness or injury of the partner proved to be risk factors while marriage proved to be a protective factor for the occurrence of MI in men, yet vacation proved to be a protective factor in both genders.

References

Allen, S.M. (1994). Gender differences in spousal caregiving and unmet need for care. *Journal of Gerontology, 49*(4), S187-195.

Alizadeh, S., Khanahmadi, S., Vedadhir, A., & Barjasteh, S. (2018). The relationship between resilience with self-compassion, social support and sense of belonging in women with breast cancer. *Asian Pacific Journal of Cancer Prevention*, *19*(9), 2469-2474.

Biglari, H., Ebrahimi, M.H., Salehi, M., Poursadeghiyan, M., Ahmadnezhad, I. & Abbasi, M. (2016). Relationship between occupational stress and cardiovascular diseases risk factors in drivers. *International Journal of Occupational Medicine and Environmental Health, 29*(6), 895-901.

Cottington, E.M., Matthews, K.A., Talbott, E. & Kueller, L.H. (1980). Environmental agents preceeding sudden death in women. *Psychosomatic Medicine, 42*, 567-574.

Davison, G.C., & Neale, J.M. (2002). *Psihologija abnormalnog doživljavanja i ponašanja.* Jastrebarsko: Naklada Slap.

Deljanin, Z., Rančič, N., Tiodorović, B., Petrović, B., Veličković, Z. & Ilić, M. (2007). Povezanost stresnih životnih događaja sa nastankom akutnog infarkta miokarda u populaciji Niša u periodu od 1998. do 2000. godine. *Vojnosanitetski pregled, 64*(7), 463-468.

Denollet, J., Vrints, C. J., & Conraads, V. M. (2008). Comparing Type D Personality and older age as correlates of tumour necrosis factor-α dysregulation in chronic heart failure. *Brain, Behavior and Immunity, 22*, 736-743.

Honig, A., & Maes, M. (2000). Psychoimmunology as a common pathogenic pathway in myocardial infarction, depression and cardiac death. *Current Opinion in Psychiatry, 13*, 661-664.

Masters, K. S., Emerson IV, R. W., & Hooker, S. A. (2022). Effects of devotional prayer and secular meditation on cardiovascular response to a faith challenge among Christians. *Psychology of Religion and Spirituality*, *14*(2), 251.

Mejia-Lancheros, C. (2015). Impact of Psychological and Social Factors on Cardiovascular Risk in an Adult Population at High Cardiovascular Risk. [Doctoral dissertation, School of Medicine, Universitat Autonoma de Barcelona].

Nelson, D. L., & Simmons, B. L. (2003). Health psychology and work stress: A more positive approach. In J. C. Quick & L. E. Tetrick (Eds.), *Handbook of occupational health psychology* (str. 97–119). American Psychological Association.

Norton, T. R., Stephens, M. A. P., Martire, L. M., Townsend, A. L., & Gupta, A. (2002). Change in the centrality of women's multiple roles: Effects of role stress and rewards. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *57*(1), S52-S62.

Radionov, T. (2022). Povezanost religioznosti s tjelesnim i mentalnim zdravljem—istraživanja, spoznaje i klinička praksa. *Obnovljeni Život*, *77*(1), 93-103.

Radulović, L. (2010). Feminizacija hodočašća u kontekstu revitalizacije religije u Srbiji. *Antropologija*, *10*(3), 39-48.

Rahe, R.H., Biersner, R.J., Ryman, D.H. & Arthur, R.J. (1972). Psychosocial predicotrs of illness behavior and failure in stressful training. *Journal of Health and Social Behavior, 13*(4), 393-397.

Sibai, A.M., Fletcher, A. & Armenian, H.K. (2001). Variations in the impact of long-term wartime stressors on mortality among the middleaged and older population in Beirut, Lebanon, 1983–1993. *American Journal of Epidemiology, 154*(2), 128–137.

Strauss-Blasche, G., Reithofer, B., Schobersberger, W., Ekmekcioglu, C., & Wolfgang, M. (2005). Effect of vacation on health: moderating factors of vacation outcome. *Journal of travel medicine*, *12*(2), 94-101.

Van Droogenbroeck, F., Spruyt, B., & Keppens, G. (2018). Gender differences in mental health problems among adolescents and the role of social support: results from the Belgian health interview surveys 2008 and 2013. *BMC psychiatry*, *18*(1), 1-9.

Williams, L., O' Conner, R. C., Howard, S., Hughes, B. M., Johnston, D. W., Hay, J. L., O'Conner, D. B., Lewis, C. A., Ferguson, E., Sheehy, N., Grealy, M. A. & O' Carrol, R. E. (2008). Type D Personality mechanisms of effect: The role of health-related behavior and social support. *Journal of Psychosomatic research, 64*, 63-69.

World Health Organization. (n.d.) *Prevention of Recurrences of Myocardial Infarction and Stroke Study.* https://www.who.int/cardiovascular_diseases/priorities/secondary_prevention/country/en/ (7.4.2018.)

Zhang, M., Zhang, J., Zhang, F., Zhang, L., & Feng, D. (2018). Prevalence of psychological distress and the effects of resilience and perceived social support among Chinese college students: Does gender make a difference?. *Psychiatry research*, *267*, 409-413.

PERSONALITY PSYCHOLOGY

Personality traits, life satisfaction, and negative emotional states: Gender differences and the Dark Triad

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Abstract

This study aimed to investigate whether the relations of the Dark Triad (above the basic personality traits) with life satisfaction and negative emotional states (i.e., depression, anxiety, and stress) differ across sex. Data were collected on a sample of 650 students (60% females, Mage = 21.73 years; SDage = 1.94) from various faculties of the University of Zagreb, Croatia. Hierarchical regression analyses showed that gender and the Big Five traits explained 13% of the variance of life satisfaction, 29% of the variance of depression, 31% of the variance of anxiety, and 37% of the variance of stress in the first step. The Dark Triad explained an additional 1% of the variance of only stress, with psychopathy being the only significant predictor among the dark traits. The interaction of gender and the dark traits significantly contributed only to the explanation of life satisfaction, with narcissism moderating the relations between life satisfaction and the Dark Triad. Taken together, the results point to the importance of both basic and dark traits in predicting life satisfaction and negative emotional states, and the importance of taking gender differences in these relations into account.

Keywords: Dark Triad; Big Five; life satisfaction; negative emotional states; gender differences

Introduction

Personality traits have been identified as important predictors of both psychological distress and wellbeing. While one line of research in this area focused only on the basic personality traits, in the last decade, the focus shifted to the so-called dark personality traits. The Dark Triad traits (i.e., Machiavellianism, subclinical narcissism, and subclinical psychopathy; Paulhus & Williams, 2002), although socially aversive, from the evolutionary standpoint, are considered to have some adaptive advantages for individuals high on these traits, such as being low on anxiety (e.g., Derefinko, 2014), experiencing less stress (e.g., Kajonius & Björkman, 2020), or higher wellbeing (e.g., Aghababaei & Błachnio, 2015). However, some findings point to health and psychological costs associated with the Dark Triad traits (e.g., Jonason et al., 2015). Moreover, there are gender differences in the Dark Triad traits (Muris et al., 2017) and the incidence of negative emotional states (e.g., Nolen-Hoeksema & Hilt, 2009; Matud, 2004), and some findings point to the gender differences in life satisfaction (see Batz & Tay, 2018). Therefore, this study aimed to investigate whether the relations of the Dark Triad (above the basic personality traits) with life satisfaction and negative emotional states (i.e., depression, anxiety, and stress) differ across sex.

Method

Participants and procedure

A total of 650 students (60% females, Mage = 21.73 years; SDage = 1.94) from various faculties of the University of Zagreb, Croatia participated in the study. Students were approached during regularly scheduled classes, and after explaining the purpose and procedure of the study, those who signed the informed consent were asked to complete the self-report questionnaires at home and return them during the next class time. The approval of an institutional review board was obtained for all aspects of the study.

Measures

The Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995) with 21 items assess acute negative emotional states of depression, anxiety, and stress. Participants are asked to report how much each item applied to them over the past week on a four-point scale (0 = *did not apply to me at all* to 3 = *applied to me very much, or most of the time*). Cronbach's alpha coefficients (α) in the present study were .87, .79, and .84 for the depression (D), anxiety (A), and stress (S) subscales, respectively.

Satisfaction With Life Scale (SWLS, Diener et al., 1985) with 5 items assesses participant's self-perceived global life satisfaction (α = .77). Participants estimate their agreement with each statement on a five-point Likert scale (1 = *totally disagree*; 5 = *totally agree*).

IPIP50 Big-Five Factor Markers (IPIP50; Mlačić & Goldberg, 2007) assess the Big-Five personality traits: Extraversion (E; α = .88), Agreeableness (A; α = .85), Conscientiousness (C; α = .83), Emotional stability (ES; α = .90) and Intellect (I; α = .80). Each subscale consists of 10 items rated on a five-point scale (ranging from 1 = *very inaccurate* to 5 = *very accurate*).

Short Dark Triad scale (SD3; Jones & Paulhus, 2014) assesses with 27 items (9 items per subscale) Machiavellianism (M; α = .76), narcissism (N; α = .66), and psychopathy (P; α = .74). Participants estimate to which extent they agree or disagree with every item on a five-point scale (ranging from 1 = *totally disagree* to 5 = *totally agree*).

The total score is calculated for each subscale of every measure, with a higher score indicating a higher level of the respective negative state, life satisfaction, or trait.

Analyses

To investigate the relations of basic and dark personality traits with life satisfaction and negative emotional states, the correlation matrix was inspected, and a series of hierarchical regression analyses were conducted with gender and basic personality traits entered in Step 1, dark personality traits in Step 2, and product term carrying the interaction between gender and each dark trait at Step 3. For testing the gender differences in the relationship between dark traits and life satisfaction and negative emotional states, a hierarchical step-down procedure was carried out. If the final step of the analysis (i.e., an omnibus test of interactions) was not significant, interaction terms were omitted from the model. In cases where the final step of the analysis was statistically significant, the sequential model revision was conducted, where nonsignificant interaction terms were sequentially omitted from the model (Aiken & West, 1991).

Results

Descriptive statistics, gender differences, and bivariate correlations between the variables are presented in Table 1. Gender differences were found in psychopathy and Machiavellianism, with males scoring higher than females. Moreover, females scored higher on Agreeableness and Extraversion, and lower on Emotional stability and Intellect than males. Among negative emotional states, females scored higher than males only on the stress subscale.

Table 1: Descriptive statistics and correlations between study variables for females and males.

	D	A	S	LS	E	A	C	ES	I	M	N	P	*M*	*SD*
D	-	.55**	.62**	-.41**	-.33**	-.18**	-.15**	-.47**	-.21**	.14**	-.11*	.19**	0.56	0.58
A	.62**	-	.67**	-.31**	-.18**	-.10*	-.16**	-.41**	-.11*	.08	-.04	.21**	0.50	0.53
S	.70**	.71**	-	-.35**	-.16**	-.08	-.11*	-.60**	-.06	.12*	-.02	.28**	0.93	0.61
LS	-.29**	-.18**	-.11	-	.28**	.01	.20**	.37**	.17**	-.07	.17**	-.08	3.60	0.66
E	-.34**	-.24**	-.23**	.16*	-	.29**	.01	.26**	.39**	-.10	.49**	.02	3.47	0.65
A	-.01	.05	.08	.14*	.15*	-	.13*	.14**	.14**	-.41**	-.02	-.40**	4.03	0.50
C	-.33**	-.25**	-.23**	.19**	.02	.11	-	.19**	.07	-.09	.01	-.17**	3.50	0.63
ES	-.48**	-.48**	-.60**	.21**	.25**	-.02	.26**	-	.13*	-.22**	.07	-.28**	3.11	0.74
I	-.09	-.09	-.08	.07	.31**	-.14*	.01	.05	-	-.02	.29**	.04	3.77	0.49
M	0	-.01	.01	-.12	.01	-.46**	.02	-.09	.06	-	.17**	.47**	3.03	0.60
N	-.13*	.02	-.06	-.09	.45**	-.18**	-.08	-.02	.31**	.26**	-	.28**	2.73	0.55
P	.04	.07	.09	-.17**	.16*	-.44**	-.16*	-.15*	.15*	.47**	.42**	-	2.01	0.58
M	0.58	0.46	0.82	3.62	3.32	3.58	3.48	3.43	3.90	3.36	2.77	2.36		
SD	0.62	0.51	0.65	0.69	0.70	0.57	0.63	0.74	0.52	0.63	0.58	0.64		
t-test	0.48	-0.96	-2.16*	0.35	-2.71*	-10.51**	-0.39	5.42**	2.97*	6.79**	0.88	7.04**		
Cohen's *d*	0.03	0.07	0.18	0.03	0.32	0.84	0.03	0.43	0.26	0.54	0.07	0.57		

Note. Results for females (*N*s range from 374 to 385) are presented above the diagonal and for males (*N*s range from 241 to 254) below the diagonal.
* *p* < .05, ** *p* < .01.

Results of the hierarchical regression analyses showed that gender and personality traits explained 37% of the variance of stress, 29% of depression, 21% of anxiety, and 13% of life satisfaction, with emotional stability being the consistent negative predictor of negative emotional states, while extraversion and consciousness negatively predicted depression and anxiety and positively predicted life satisfaction (Table 2). The Dark Triad contributed over and above basic personality traits only in the prediction of stress, with psychopathy positively predicting stress. The interaction of gender and the Dark Triad was significant only in the prediction of life satisfaction; thus, the two insignificant interactions were excluded from the model one by one, and in the final model ($F(10, 563) = 4.11$, $p < .001$) only the interaction of gender and narcissism remained significant ($\beta = -.14$, $p = .005$).

Table 2: Results of hierarchical regression analyses for negative emotional states and life satisfaction.

	Variables	D	A	S	LS
Step 1	Gender	.09*	.03	.06	-.04
	E	-.21***	-.12**	-.06	.15***
	A	-.01	.03	.06	.01
	C	-.15***	-.12**	-.05	.14***
	ES	-.41***	-.40***	-.60***	.23***
	I	-.04	.00	-.01	.07
	R^2	.29	.21	.37	.13
	F	40.13***	26.46***	58.56***	15.28***
Step 2	Gender	.08	.02	.05	-.03
	E	-.22***	-.16***	-.08*	.17***
	A	.01	.06	.11**	-.05
	C	-.14***	-.11**	-.04	.14***
	ES	-.40***	-.39***	-.58***	.21***
	I	-.05	-.02	-.02	.08
	M	-.03	-.08	-.05	-.02
	N	.00	.06	.00	-.01
	P	.08	.11	.16***	-.08
	ΔR^2	.01	.01	.01	.01
	F	0.96	2.80*	4.50**	1.30
	R^2	.21	.22	.39	.13
	F	27.07***	18.74***	41.27	10.64***
Step 3	Gender	.08	.03	.05	-.02
	E	-.22***	-.16***	-.08	.18***
	A	.01	.06	.11*	-.06
	C	-.14***	-.11**	-.04	.14***
	ES	-.40***	-.39***	-.58***	.21***
	I	-.05	-.02	-.02	.08
	M	-.02	-.08	-.06	-.01
	N	.03	.06	.04	.06
	P	.09	.13	.19***	-.04
	M x Gender	-.02	-.01	.02	-.03
	N x Gender	-.05	.00	-.07	-.12*
	P x Gender	-.02	-.03	-.05	-.05
	ΔR^2	.01	.01	.01	.01
	F	0.73	0.19	1.46	3.20*
	R^2	.29	.22	.3910	.14
	F	20.45***	14.04***	31.39***	8.87***

$^*p < .05$, $^{**}p < .01$, $^{***}p < .001$.

As it can be seen in Figure 1, higher narcissism was associated with lower life satisfaction in males, but higher in females.
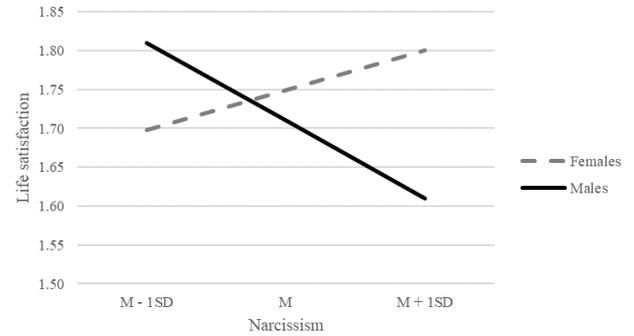
Figure 1: Interaction between sex and narcissism on life satisfaction.

Discussion and Conclusion

The results of this study indicated that the basic personality traits (i.e., emotional stability, extraversion, and consciousness, in line with previous findings, e.g., Kotov et al., 2010) explained a substantial proportion of variance of negative emotional states (primarily stress), and a smaller amount of variance of life satisfaction, while the Dark Triad traits explained only a small additional proportion of variance above the Big five traits. Out of the dark traits, only psychopathy was a positive predictor of stress, corroborating the notion that psychopathy, among the Dark Triad traits, is related to adverse psychosocial outcomes the most (see Muris et al., 2017). Furthermore, only one interaction between the Dark Triad traits and gender was found, where higher narcissism was associated with lower life satisfaction in males, but higher in females. This finding is in line with previous notions that dark traits can confer certain benefits for the individual (e.g., Jonason et al., 2012), and the interesting gender difference obtained in this study should be studied further in more diverse samples.

In sum, this study indicated that both basic and dark traits are important in predicting life satisfaction and negative emotional states; however, the role of the Dark Triad traits seems to be far less than that of the role of the Big five traits in these predictions.

References

Aghababaei, N., & Błachnio, A. (2015). Well-being and the Dark Triad. *Personality and Individual Differences, 86*, 365-368. https://doi.org/10.1016/j.paid.2015.06.043

Aiken, L. S., & West, S. G. (1991). *Multiple Regression: Testing and interpreting interactions*. Thousand Oaks: Sage.

Batz, C., & Tay, L. (2018). Gender differences in subjective well-being. In E. Diener, S. Oishi, & L. Tay (Eds.),

Handbook of well-being. Salt Lake City, UT: DEF Publishers.

Derefinko, K. J. (2015). Psychopathy and low anxiety: Meta-analytic evidence for the absence of inhibition, not affect. *Journal of Personality, 83*(6), 693-709. https://doi.org/10.1111/jopy.12124

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49*, 71-75. https://doi.org/10.1207/s15327752jpa4901_13

Jonason, P. K., Baughman, H. M., Carter, G. L., & Parker, P. (2015). Dorian Gray without his portrait: Psychological, social, and physical health costs associated with the Dark Triad. *Personality and Individual Differences, 78*, 5-13. https://doi.org/10.1016/j.paid.2015.01.008

Jonason, P. K., Webster, G. D., Schmitt, D. P., Li, N. P., & Crysel, L. (2012). The antihero in popular culture: Life history theory and the dark triad personality traits. *Review of General Psychology, 16*, 192–199. https://doi.org/10.1037/a0027914

Jones, D. N., & Paulhus, D. L. (2014). Introducing the Short Dark Triad (SD3): A brief measure of dark personality traits. *Assessment, 21*(1), 28-41. https://doi.org/10.1177/1073191113514105

Kajonius, P. J., & Björkman, T. (2020). Dark malevolent traits and everyday perceived stress. *Current Psychology, 39*(6), 2351-2356. https://doi.org/10.1007/s12144-018-9948-x

Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking "big" personality traits to anxiety, depressive, and substance use disorders: A meta-analysis. *Psychological Bulletin, 136*(5), 768-821. https://doi.org/10.1037/a0020327

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33*(3), 335-343. https://doi.org/10.1016/0005-7967(94)00075-U

Matud, M. P. (2004). Gender differences in stress and coping styles. *Personality and Individual Differences, 37*(7), 1401-1415. https://doi.org/10.1016/j.paid.2004.01.010

Mlačić, B., & Goldberg, L. R. (2007). An analysis of a cross-cultural personality inventory: The IPIP Big-Five factor markers in Croatia. *Journal of Personality Assessment, 88*(2), 168-177. https://doi.org/10.1080/00223890701267993

Muris, P., Merckelbach, H., Otgaar, H., & Meijer, E. (2017). The malevolent side of human nature: A meta-analysis and critical review of the literature on the Dark Triad (narcissism, Machiavellianism, and psychopathy).

Perspectives on psychological science, *12*(2), 183-204. https://doi.org/10.1177/1745691616666070

Nolen-Hoeksema, S., & Hilt, L. M. (2009). Gender differences in depression. In I. H. Gotlib & C. L. Hammen (Eds.), *Handbook of depression* (pp. 386–404). The Guilford Press.

Paulhus, D. L., & Williams, K. M. (2002). The Dark Triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality, 36*(6), 556-563. https://doi.org/10.1016/S0092-6566(02)00505-6

The Path to the 'Happily Ever After': The Role of Love Styles in the Quality of the Relationship

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Abstract

A quality relationship can be the path to our happy end in love - do love styles play one of the important roles on that path? The Color Wheel Theory of love is an idea created by psychologist John Alan Lee that describes six styles of love and each of them represents a different approach in love relationships - Eros, Ludus, Storge, Pragma, Mania and Agape. The aim of this study was to examine whether the quality of a relationship could be predicted based on love styles. The sample consisted of 230 students (M = 52; F = 178) of the University of Nis, aged 18-31 (M = 23.15, SD = 2.67) who were in heterosexual love relationships who completed: The Love Attitude Scale Short form and Perceived Relationship Quality Questionnaire. The quality of the relationship was viewed in this research as a global concept, even though it is a complex phenomenon that consists of satisfaction, commitment, intimacy, trust, passion, and love. Results of multiple regression analysis showed that the quality of the relationship could be predicted on the basis of love styles - Eros and Ludus. We concluded that individuals with Eros love style who have intense emotional experience, described as passionate and strong physical attraction and commitment to the romantic partner, tend to have quality relationships, unlike people with Ludus love style who perceive love as a desire to have fun with each other.

Keywords: relationship quality, love styles, Eros, students

Introduction

Lee (1973; per Neto, 2007) used the metaphor of a color wheel on which he placed his many "colors" of love, and so identified six socio-ideologies or styles to reflect the diversity of human ways of loving further described. Eros is characterized by the search for a beloved whose physical presentation of self embodies an image already held in the mind of the lover (Lee, 1977). Ludus, is described as permissive, and playful or game love. Involvement of individuals with Ludus love style is carefully controlled, and they experience multiple relationships that are often relatively short-lived. Storge is a style based on slowly developed affection and companionship, a gradual disclosure of self, an avoidance of self-conscious passion, and an expectation of long-term commitment. Mania is an obsessive, jealous, emotionally intense love style characterized by preoccupation with the beloved and a need for repeated reassurance of being loved. Agape is altruistic love, given because the lover sees it as his duty to love without expectation of reciprocity. It is mostly guided by reason, rather than emotion. Pragma is a style that involves conscious consideration of vital statistics about a suitable beloved, such as education, vocation, religion, age etc.

After reviewing the empirical and theoretical literature, Fletcher et al. (2000) identified six constructs that commonly represent distinct components of perceived relationship quality: satisfaction, commitment, trust, intimacy, passion and love. Agape love style is positively correlated to relationship quality, regardless of the level of education, religiousness, or gender (Lin & Huddleston-Casas, 2005; per Raffagnino & Puddu, 2018).

Fricker and Moore (2002) claimed that relationship satisfaction would be positively predicted by Eros and Agape, and negatively by Ludus based on the love style model. Roles of Mania, Pragma and Storge were unclear both from a theoretical and past research perspective (Fricker & Moore, 2002).

The aim of this study was to examine whether the quality of a relationship (PRQ) can be predicted based on love styles in young unmarried couples. We hypothesized that relationship quality had statistically significant positive correlation with Eros and Agape, and negative correlation with the rest of the love styles. In addition we hypothesized that Eros, Ludus, and Agape are statistically significant predictors of the quality of the relationship.

Method

Participants and Procedure

The sample consisted of 230 students (M = 52; F = 178) of the University of Nis, aged 18-31 (M = 23.15, SD = 2.67) who were in heterosexual love relationships. The research was conducted via social networks during spring of 2019. Respondents were informed about the research purposes and they filled in questionnaires voluntarily and anonymously. Thus, ethical approval was obtained for this study.

Instruments

The Love Attitudes Scale (LAS – short form) – 18 item scale (Hendrick et al. 1998) was used to measure Lee's love styles - Eros, Ludus, Storge, Mania, Pragma and Agape on a 5-point Likert scale (1 means strongly agree; 5 means strongly disagree). The reliability of the subscales was as follows: Eros - α = .75; Ludus - α = .43; Storge - α = .85, Pragma - α = .64, Mania - α = .43 and Agape - α = .81.

Perceived Relationship Quality Questionnaire (Fletcher et al., 2000) – 18 item scale was used to measure relationship quality - love, passion, commitment, trust, satisfaction and intimacy. The task of the respondents was to assess the

current relationship on a seven-point Likert scale (1 means not at all -; 7 means exceptional). The reliability of the subscales was as follows: satisfaction - $\alpha = .81$; commitment - $\alpha = .25$; intimacy - $\alpha = .76$, trust - $\alpha = .65$, passion - $\alpha = .68$ and love - $\alpha = .36$. The overall scale had satisfactory internal reliability on the tested sample of $\alpha = .91$ which is why in testing our hypothesis we used the global concept of the perceived relationship quality.

Results

The correlation between Love Styles and Perceived Relationship Quality was expressed using Pearson's correlation coefficient.

Table 1: Intercorrelations between Perceived Relationship Quality and Love Styles

	PRQ	E	L	S	P	M	A
PRQ	-						
E	.66**	-					
L	-.37**	-.17**	-				
S	-.10	-.17**	.03	-			
P	-.15*	-.18**	.15*	.14*	-		
M	-.06	.02	.16*	-.15*	.18**	-	
A	.18**	.19**	-.13*	.07	-.05	.27**	-

Note: PRQ – Perceived Relationship Quality; E – Eros; L – Ludus; S – Storge; P – Pragma; M – Mania; A – Agape;
**p < .01; *p < .05

Results in Table 1 showed that there was a correlation between the global variable of PRQ with each of the love styles, except with the Storge and Mania. Thus one of the research hypotheses was partially confirmed.

Table 2. Love styles as predictors of Perceived Relationship Quality

Criteria	Predictors	β	Sum of model
Perceived Relationship Quality	Eros	**.612***	R= .71 R²= .50 F(6, 223)= 37.74***
	Ludus	**-.253***	
	Storge	.003	
	Pragma	.013	
	Mania	-.043	
	Agape	.041	

Furthermore, multiple linear regression was performed by inserting love styles as predictor variables and PRQ as a criterion variable. Because the values of the VIF statistic were ranging from 1.09 to 1.22, there was no high correlation between the predictor variables and the regression results were reliable.

The results of multiple regression analysis showed that the Perceived Quality Relationship could be predicted on the basis of love styles. The model was statistically significant [$R^2 = .50$, F (6, 223) = 37.77, p<.001], Eros ($\beta = .61$, p<.001) and Ludus ($\beta = -.25$, p<.001) were significant predictors, which was the confirmation of the specific hypothesis of this research.

Discussion and Conclusion

Results of this research have confirmed the hypothesis that Love styles were significant in the prediction of relationship quality of young adults. The correlation between different love styles and PRQ was also partially confirmed, emphasizing the positive correlation of Eros, as well as the negative correlation of Ludus with PRQ. Ludus indications, however, should be taken with caution regarding the low reliability the variable showed on the taken sample.

Other conducted research has confirmed this type of correlation of Eros and Ludus with PRQ components (Davis & Latty-Mann, 1987; Fricker & Moore, 2002). In their research, Goodboy and Myers (2010) presented the information from previous studies showing that Eros and Agape love styles typically foster relationship satisfaction, the tendency to fall in love, and relational intensification; while Ludus love style typically produced lower quality romantic relationships characterized by dissatisfaction, cheating, and defeatist attitudes toward romance. In current research Mania, Pragma and Storge love styles were not significant predictors of relationship quality, as was shown in the research of Fricker & Moore (2002). It may be that individuals who endorsed Eros, Ludus, or Agape engaged in specific behaviors that affected the outcome of their involvements (positively or negatively), whereas the actions of those who endorsed the remaining love styles were less likely to influence their relationship. In particular, the lack of emotional intensity characteristic of Storge and Pragma may account for the finding that these love styles were less strongly associated with the relationship outcome measures utilized in this study. Eros and Agape love styles may employ relationship-nurturing behaviors that influence the quality of their relationships. Conversely, Ludus discourages the formation of genuine intimacy, leaving little wonder for why the satisfaction in relationships is low (Morrow, Clark & Brock 1995). Furthermore, some of the research on love styles and relationship quality have shown the correlation of Agape with all of the PRQ components (Davis & Latty-Man, 1987; Farooqi, 2014), and in our research the correlation between Agape and global variable of PRQ is confirmed.

In conducting further research on this topic, it would be a great improvement composing more various samples and taking into consideration a bigger age span, as well as couples instead of individuals. Due to the low reliability of some of the love style predictors, the indications should be taken with caution. Thus we would recommend using the original form of the scale instead of the short one in recreating the research. Different love styles can have a different influence on the relationship and its quality - as risk factors and as resources.

Their identification is possible through the application of the instruments used in this research conducted in the Serbian population. Acknowledging the love style of an individual and its influence on the relationship may help prevent crucial details that are necessary to improve relationship quality.

References

Davis, K. E.; Latty-Mann, H. (1987). *Love Styles and Relationship Quality: A Contribution to Validation. Journal of Social and Personal Relationships, 4(4),* 409–428. https://doi.org/10.1177/0265407587044002

Farooqi, S. R. (2014). *The Construct of Relationship Quality. Journal of Relationships Research, 5.* doi:10.1017/jrr.2014.2

Fletcher, G. J. O.; Simpson, J. A.; Thomas, G. (2000). *The Measurement of Perceived Relationship Quality Components: A Confirmatory Factor Analytic Approach. Personality and Social Psychology Bulletin, 26(3),* 340–354. https://doi.org/10.1177/0146167200265007

Fricker, J., & Moore, S. (2002). Relationship satisfaction: The role of love styles and attachment styles. *Current Research in Social Psychology, 7,* 182–204.

Goodboy, Alan K., Myers, Scott A., & Members of Investigating Communication (2010). Relational Quality Indicators and Love Styles as Predictors of Negative Relational Maintenance Behaviors in Romantic Relationships. *Communication Reports, 23(2),* 65–78. https://doi.org/10.1080/08934215.2010.511397

Hendrick, C., Hendrick, S., & Dicke, A. (1998). The Love Attitudes Scale: *Short form. Journal of Personal and Social Relationships*, 15, 147-159.

Lee, J. A. (1977). A Typology of Styles of Loving. *Personality and Social Psychology Bulletin, 3(2),* 173–182. https://doi.org/10.1177/014616727700300204

Morrow, G. D., Clark, E. M., & Brock, K. F. (1995). Individual and Partner Love Styles: Implications for the Quality of Romantic Involvements. *Journal of Social and Personal Relationships, 12(3),* 363–387. https://doi.org/10.1177/0265407595123003

Neto, Felix (2007). Love Styles: A Cross-Cultural Study of British, Indian, and Portuguese College Students. *Journal of Comparative Family Studies, 38(2),* 239–254. https://doi.org/10.3138/jcfs.38.2.239

Raffagnino, R. and Puddu, L. (2018) Love Styles in Couple Relationships: A Literature Review. *Open Journal of Social Sciences*, *6,* 307-330. https://doi.org/10.4236/jss.2018.612027

Development and Validation of the Scepticism towards Science Scale

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Abstract

Previous research has either been mainly focused on domain-specific scepticism or on some of the related constructs. Existing scales are mostly one-dimensional and they do not set a clear boundary between scepticism and trust in science. Accordingly, the goal of this study was the development of a scale that would distinguish and measure scepticism towards science in general and include four dimensions - healthy and harmful scepticism and healthy and harmful trust in science. The final instrument (Scepticism towards Science Scale) was validated on the sample consisting of 236 respondents. The final instrument consisted of 7 items per subscale. Using exploratory factor analysis three factors were extracted – Skepticism, Dogma and Trust. We correlated our three factors with Trust in Science and Scientists Inventory (TSS), Conspiracy Mentality Questionnaire (CMQ) and Right-Wing Authoritarianism Scale (RWA). High correlations with TSS, moderate with CMQ and low with RWA suggest good convergent and divergent validity. We debate the number of factors extracted, their possible interpretations, and overall psychometric characteristics of the instrument. Additionally, we discuss the practical implications and limitations of the study.

Keywords: scepticism towards science, trust in science, dogma, scale development

Introduction

Scepticism towards science refers to suspicion, mistrust and questioning of the scientific method, scientists and scientific facts, whereby this can vary from healthy, necessary critical thinking to the rejection of science and scientific facts (Le Morvan, 2011). Previous research on scepticism towards science (Lewandowsky et al., 2013) has mostly been domain-specific and has examined scepticism about vaccinations, climate change, genetically modified foods and other relevant or related scientific topics at that time (for example constructs like conspiratorial thinking) (Bruder et al., 2013). In the small amount of research that focused on general attitudes towards science (Nadelson et al., 2014), the operationalizations were unidimensional and did not set clear boundaries between scepticism and trust in science. Based on existing literature, it is hard to tell if scepticism and trust are different constructs or different poles of the same dimension. During construction of our scale, we relied on Morel and Pruyn's understanding of this question: "whereas cynicism (distrust) refers to an evaluation of something or someone as being (dis)honest or (un)reliable, skepticism refers to an evaluation of the extent to which something is true" (Morel and Pruyn, 2003). Based on this understanding, we decided to separate scepticism and trust (the opposite pole of distrust) towards science. Existing literature also separates healthy (or rational, scientific) and harmful (unhealthy) scepticism. While harmful scepticism refers to science rejection that is not based on facts and knowledge, healthy scepticism is a tendency to doubt the claims that are not based on good evidence and accept only those that are well argued by scientific findings (Le Morvan, 2011; Bryce & Day, 2014). Similar difference can be found between healthy and harmful trust (or dogmatism): while healthy trust represents belief in science and its method (Nadelson et al., 2014), harmful trust represents absolute acceptance of science including rigidity of thinking (Eisenstein & Clark, 2014). Considering all of the above, the study's goal was to develop a scale that would distinguish and measure scepticism towards science in general and include four, qualitatively different, dimensions - healthy and harmful scepticism and healthy and harmful trust in science. We started the construction of the instrument based on theoretical knowledge about the construct acquired through a review of earlier research and existing operationalizations, such as the Credibility of Science Scale, which aimed to determine how much respondents value science and scientists, their objectivity and competence (Hartman et al.,

2017), the Trust in Science and Scientists Inventory, whose object of measurement is trust in science and scientists (Nadelson et al., 2014), and the Belief in Science Scale (BISS) focused on belief in science (Farias et al., 2013).

Pilot study

The initial item-pool consisted of 62 items. The sample consisted of 1625 participants: 89.1% female, age range 16-88 (M=41.32, SD= 11.96). A pilot study was administered via Google Forms. We used convenience sampling - gathering participants through sharing online link to our survey on social media platforms. Reliability of the subscales was: α= .89 for Harmful Scepticism, α= .90 for Healthy Scepticism, α= .88 for Harmful Trust and α= .91 for Healthy Trust. Criteria for item retention in the final instrument were chosen based on obtained indices of item representativeness (measures above .90), reliability and validity (above .30) and adequate item fit (.70-1.30), by choosing the best subset of items within each subscale. After the exclusion of items demonstrating poor psychometric properties, the final questionnaire consisted of 28 items (7 items per subscale), while reliability of the subscales was α= .79 for Hamrful Scepticism, α= .89 for Healthy Scepticism, α= .86 for Harmful Trust and α= .83 for Healthy Trust.

Method

Sample and procedure

The survey was administered via Google Forms, while the sample consisted of 219 voluntary participants (69.4% female), aged 18-60 (M = 28.51, SD = 11.80). Informed consent was obtained from all participants in the study.

Measures

Scepticism Towards Science Scale (STS) represents a self-report questionnaire consisting of subscales Healthy Scepticism, Harmful Scepticism, Healthy Trust and Harmful Trust including 7 items per subscale. Answers are given on a 5-point Likert scale (1 - Strongly Disagree, 5 - Strongly Agree). Trust in Science and Scientists Inventory TSS (Nadelson et al, 2014)), used as a convergent validation measure, is a selfreport scale composed of 21 items (α= .91) which are rated on a 5-point Likert scale (1 - Strongly Disagree, 5 - Strongly Agree). We used both Conspiracy Mentality Questionnaire (CMQ) (Bruder et al., 2013) and Right-wing Authoritarianism Scale (RWA) (Altemeyer, 1996) as a divergent validation measure. CMQ measures the tendency towards conspiratorial thinking. It is a self-report scale composed of 5 items (α= .70) which are rated on a 5-point Likert scale, but in this research, we used 9-point Likert Scale (1 - Strongly Disagree, 9 - Strongly Agree) to increase the discrimination of our participants. RWA consists of 3 facets - authoritarian submission, authoritarian aggression and conservativism (Funke, 2005). In this study, we used a short version of this scale that consists of 12 items and answers are given on 5-point Likert scale (α= .72) (Funke, 2005).

Data analysis

STS factor structure was examined throughout exploratory factor analysis (EFA) in SPSS software (SPSS, v. 25) using the Maximum likelihood estimation method and Promax rotation. Horn's parallel criterion was used when deciding on the number of retained factors (R-Studio, Paran package, v. 1.5.2; Dino & Dino, 2018), as well as Catell's scree plot (SPSS, v. 25). Psychometric characteristics of subscales were obtained using rtt10g macro (Knežević & Momirović, 1996), while convergent and divergent validity was examined through Pearson's correlations (SPSS, v. 25).

Results

Factor analysis

The first criterion we used when deciding the number of factors we would keep was the Guttman-Kaiser criterion and it suggested a 6-factor solution. However, Pattern Matrix showed that two factors contained only one item, so we immediately gave up on 5-factor and 6-factor solutions. Looking at Cattell's Scree plot, we noticed a steep decrease in eigenvalue after the third extracted factor. Then, we decided to conduct factor analyses with fixed factors, with four, three, and two factors. In 4-factor solution, only three items belonged to the fourth factor, so we rejected that option. In the end, we decided to leave three factors for several reasons. It was shown that the percentage of the variance explained by the first and the second factor in the 3-factor solution was almost the same as in the 2-factor solution for those two factors, but the percentage of variance explained by the third factor in the 3-factor solution was almost the same as it was for the second factor in that solution. Therefore, leaving the 3-factor solution provided the increase in the variance explained. In the end, Horn's criterion proposed a 3-factor solution as an optimal one, so we decided to leave three factors. The first factor, Scepticism (α= .90), accounted for 31.73% of the total variance and it refers to doubt about scientific findings and a tendency to question their validity. It consists of the same items as initially assumed Healthy Scepticism and all of these items are reverse coded. The second factor, named Dogma (α= .85), accounted for 8.19% of the total variance and it implies extreme, unconditional trust in science and belief in its infallibility. For example, an item like "All scientific findings should be believed to be true" implies that every scientific finding should be accepted just because it is scientific. Therefore, it denies the importance of critical thinking. Items with negative loadings on this factor also reflect this, for example, "I accept every scientific theory with a certain amount of doubt" rejects any form of questioning, even though it is crucial for science to progress. This factor consists of items that belonged to both Harmful Scepticism and Harmful Trust theoretical subscales. The last factor, Trust (α= .88), accounted for 6.65% of the total variance and it represents a reasonable dose of trust in science based on facts. It is interesting how, differently from Dogma, this factor shows welcoming of the questioning of scientific findings. A good

example of this is an item that is negatively loaded on Trust: „I don't put much hope in science because it says one thing today and another one tomorrow". This item, negatively coded, implies belief in science because of its constant urge to question and change the old findings for the new, more accurate ones. Factor Trust consists of all the items that belonged to Healthy Trust, and it also includes items that were a part of the Harmful Scepticism and Harmful Trust subscales. Our items and their loadings on each factor can be found in Appendix A.

Intercorrelations between our three factors can be seen in Table 1. As expected, Dogma and Trust, both representing the acceptance of science, correlate positively with each other and negatively with Scepticism. Also, it was expected that Scepticism's negative correlation with Dogma is greater than the one with Trust, as Dogma reflects a more extreme belief in science and a complete lack of critical thinking.

Table 1: Intercorrelations between factors

	Scepticism	Dogma	Trust
Scepticism		- .612**	- .445**
Dogma			.457**
Trust			

** p < .01

Convergent and divergent validity

We correlated our three factors with Trust in Science and Scientists Inventory (TSS, α= .91), Conspiracy Mentality Questionnaire (CMQ, α= .70) and Right-Wing Authoritarianism Scale (RWA, α= .72). High correlations with TSS, moderate with CMQ and low with RWA are by our expectations and they suggest good convergent and divergent validity. The only unexpected finding was the lack of correlations between RWA and two of our factors, Scepticism and Dogma (Table 2). It is important to note that, even though Dogma represents absolute and unfounded beliefs in science, a negative correlation with CMQ was expected as it was found in previous research that conspiratorial thinking is a predictor of science rejection (Lewandowsky et al., 2013). Dogma does not include rejection of science, on the contrary, it includes its unconditional acceptance.

Table 2: Correlations between STS and TSS, CMQ and RWA

	Scepticism	Dogma	Trust
TSS	- .502**	.541**	.828**
CMQ	.214**	- .346**	- .426**
RWA	.084	- .020	- .255**

** p < .01

Discussion

Contrary to our theoretical expectations about four qualitatively different dimensions, three factors were obtained through factor analysis. Also, one unexpected finding related to divergent validity was the lack of correlation between RWA and two of our factors. These results could be explained by the limitations of our study, specifically the lack of a representative sample. Our sample mainly consisted of students, who are expected to be more in touch with science than the general population, and therefore most likely have more trust in science and the scientific method. It could be that we did not catch those respondents with the highest levels of scepticism towards science (which is in accordance with the negative asymmetric distribution of our factor Trust (zSk= -3.88), though other factors had normal distribution). It is reasonable to assume that these results could be different if our sample was representative. Therefore, our advice for future research is to test our findings on a representative sample.

In the end, our Scepticism Towards Science Scale showed good internal consistency and generally good divergent and convergent validity. We would also like to emphasize the importance of our instrument, as it is the first multidimensional instrument measuring attitudes towards science and its method generally, setting clear boundaries between scepticism and trust.

References

Altemeyer, B. (1996). *The authoritarian specter*. Cambridge: Harvard University Press

Bruder, M., Haffke, P., Neave, N., Nouripanah, N., & Imhoff, R. (2013). Measuring Individual Differences in Generic Beliefs in Conspiracy Theories Across Cultures: Conspiracy Mentality Questionnaire. *Frontiers in Psychology*, 4. https://doi.org/10.3389/fpsyg.2013.00225

Bryce, T. G., & Day, S. P. (2014). Scepticism and doubt in science and science education: the complexity of global warming as a socio-scientific issue. *Cultural Studies of Science Education,* *9*(3), 599-632. https://doi.org/10.1007/s11422-013-9500-0

Dinno, A., & Dinno, M. A. (2018). Package 'paran'. Version 1.5.2

Eisenstein, M. A., & Clark, A. K. (2014). Political tolerance, psychological security, and religion: Disaggregating the mediating influence of psychological security. *Politics and Religion,* *7*(2), 287-317. https://doi.org/10.1017/S1755048314000054

Farias, M., Newheiser, A. K., Kahane, G., & de Toledo, Z. (2013). Scientific faith: Belief in science increases in the face of stress and existential anxiety. *Journal of experimental social psychology*, *49*(6), 1210-1213. https://doi.org/10.1016/j.jesp.2013.05.008

Funke, F. (2005). The Dimensionality of Right-Wing Authoritarianism: Lessons from the Dilemma between Theory and Measurement. *Political Psychology*, *26*(2), 195–218. https://doi.org/10.1111/j.1467-9221.2005.00415

Hartman, R. O., Dieckmann, N. F., Sprenger, A. M., Stastny, B. J., & DeMarree, K. G. (2017). Modeling Attitudes Toward Science: Development and Validation of the Credibility of Science Scale. *Basic and Applied Social*

Psychology, *39*(6), 358–371. https://doi.org/10.1080/01973533.2017.1372284

Knežević, G., & Momirović, K. (1996). RTT9G i RTT10G: dva programa za analizu metrijskih karakteristika kompozitnih mernih instrumenata. *Merenje u psihologiji, 2* (str. 35-56). Beograd: Institut za kriminološka i sociološka istraživanja

Le Morvan, P.(2011). Healthy Skepticism and Practical Wisdom: *Logos & Episteme*, *2*(1), 87–102. https://doi.org/10.5840/logos-episteme20112151

Lewandowsky, S., Gignac, G. E., & Oberauer, K. (2013). The Role of Conspiracist Ideation and Worldviews in Predicting Rejection of Science. *PLoS ONE*, *8*(10), e75637. https://doi.org/10.1371/journal.pone.0075637

Morel, K. P., & Pruyn, A. T. H. (2003). Consumer skepticism toward new products. *ACR European Advances.*

Nadelson, L., Jorcyk, C., Yang, D., Jarratt Smith, M., Matson, S., Cornell, K., & Husting, V. (2014). I Just Don't Trust Them: The Development and Validation of an Assessment Instrument to Measure Trust in Science and Scientists: Trust in Science and Scientists. *School Science and Mathematics*, *114*(2), 76–86. https://doi.org/10.1111/ssm.12051

Appendix A: Items and their loading on each factor (1 – Scepticism, 2 – Dogma, 3 – Trust)

Items	Factors		
	1	2	3
The scientific worldview is the only one that gives a clear picture of the world as it is.	-.936		
Only science can provide answers to the most important questions.	-.856		
I believe that one day we will manage to explain everything through science.	-.836		
The only knowledge we can really rely on is scientific knowledge.	-.801		
I think science can help us understand how everything works, it just takes time.	-.672		
I put all my hopes in science because it is the only one that offers a solution to the problems that people face.	-.662		
It is better to be guided by scientific claims than by intuition.	-.494		
All scientific findings should be believed to be true.		.796	
I see no significant reason to doubt science.		.779	
I have no doubts about scientific theories and I believe them completely.		.747	
If a scientific theory is generally accepted, I have no reason to doubt it.		.729	
I think science is never wrong.		.712	-.335
I accept every scientific theory with a certain amount of doubt.		-.631	
We should take what scientists say with a certain amount of doubt.		-.618	
Regardless of the scientific field, I always trust scientific results.		.535	
I don't think many people realize how flawed the scientific method is.		-.426	
There are suspicious motives behind many scientific studies.		-.389	-.366
I don't put much hope in science because it says one thing today and another one tomorrow.			-.782
Since scientific findings are constantly changing, it is pointless to believe in their truthfulness.			-.733
Many scientific studies do more harm than good.			-.648
Most scientific theories and claims are wrong.			-.574
I fear that science will destroy any chance for world peace.			-.573
Most scientific theories and claims are supported by evidence.			.554
I think that scientific research is important for the life of the average person.			.483
I will always be guided by my common sense rather than scientific facts.			-.440
Science should be trusted because it is not based on one's impressions but on well-verified facts.			.429
Many generally accepted scientific theories are not based on adequate evidence.			-.414
Scientific achievements often produce harm to society.			-.390

Adverse Childhood Experiences and the Dimensions of the Moral Foundations Theory

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Abstract

Adverse childhood experiences (ACEs) are harmful experiences that happen before reaching legal age and consist of neglect, abuse, and family dysfunction. Previous research showed ACE scores correlating with criminality. There is some evidence of the correlation between ACE and decreased moral sensitivity, which could be one of the mechanisms underlying the link between ACEs and antisocial behavior. This research explores the relationship between the ACE score and the moral foundations of the Moral Foundations Theory (MFT). MFT proposes five moral foundations that act as "intuitions" for people to rely on when making moral judgments. The five criteria form two general factors: Binding (ingroup loyalty, authority, and sanctity) and Individualizing (care and fairness). A sample of 432 participants filled out an online survey. The ACE-14 questionnaire measured the ACE score, and the MFQ-30 measured the moral criteria. We found small significant negative correlations between the ACE score and all Binding facets. There were no correlations between the ACE score and the Individualizing moral foundations. The results imply higher ACEs are related to a slight but significant decrease in reliance on foundations, which aim to maintain social unity. This suggests that there could be merit in exploring MFQ dimensions as mediators between ACEs and criminal behavior in future research.

Keywords: adverse childhood experiences (ACEs); moral foundations theory (MFT); binding moral judgment criteria; individualizing moral judgment criteria

Introduction

Adverse Childhood Experiences

Adverse childhood experiences (ACEs) are disadvantageous experiences that occur before becoming a legal adult. ACE model derived from the CDC-Kaiser Permanente ACE study (Anda et al., 2010; Felitti et al., 1998; Hughes et al., 2017) arguably emerged as the most influential. It proposed 10 main ACE categories of neglect, abuse, and family dysfunction, with some extensions (e.g., Finkelhor et al., 2015) advocating for the addition of categories of peer victimization, isolation/rejection, community violence exposure, and low SES. Research has shown a substantive prevalence of this model's categories in the population and has identified many severe negative health and behavioral outcomes related to them (Anda et al., 2010; Felitti et al., 1998; Hughes et al., 2017). This, among other outcomes, includes the propensity for antisocial behavior, violence, and criminality (Fox et al., 2015; Levenson & Grady, 2016; Reavis, et al., 2013; Topizes et al., 2012). Criminal offenders tend to have higher rates of childhood adversity than the general population (Levenson et al., 2014; Tripodi & Pettus-Davis, 2013). For example, Maschi et al. (2013) report that before the age of 16, 48% of inmates had experienced domestic violence, over one-third were emotionally or physically abused, 19% were sexually assaulted, and 18% had experienced emotional neglect.

The Moral Foundations Theory

Many moral theories have influenced psychological research (Bartels & Pizarro, 2011; Greene et al., 2001; Kahane et al., 2015). However, psychological research tends to oversimplify them, e.g., by using artificial moral dilemmas, such as the famous Trolly problem, which ironically turned out to be a better measure of psychopathy than morality (Bartels & Pizarro, 2011; Kahane et al., 2015; Keleman et al., 2019). Moral dilemmas in research are typically judged on two criteria – was someone harmed, and was this fair to everyone? As Graham et al. (2011) point out – there is more to morality than that.

The Moral Foundations Theory (Graham et al., 2011; see also: Doğruyol et al., 2019) – MFT suggests that the moral domain consists of several dimensions (or: 'criteria' or 'foundations') that a person (often "intuitively") considers when making moral judgments. MFT currently proposes five of them: *Sanctity/degradation/purity* – a need to remain clean and pure spiritually; *Authority/subversion* – a need to respect the social hierarchy and authority; *Loyalty/betrayal/ingroup* – a closeness and responsibilities towards own group;

Care/harm – making sure no one is hurt or endures pain; *Fairness/cheating* – making sure everyone gets a fair treatment. These dimensions can be further grouped into two more general factors (e.g., Bobbio et al., 2011): 1) *Individualizing* (Fairness and Care) and 2) *Binding* (Authority, Loyalty, and Sanctity). Binding has the purpose of maintaining the structure and importance of the group or community while individualizing aims to maintain good relations among individuals.

Childhood Adversity and Morality

Surprisingly little direct research has been conducted on the relationship between the social environment and adverse upbringing in regards to moral development (and potential resulting antisocial behavior). Xiang, Cao et al. (2020) found that childhood maltreatment is predictive of lesser moral sensitivity, with social support partly mediating this relationship. Xiang, Chen et al. (2020) found a negative correlation between childhood abuse and moral disgust – which is an indirect measure of morality. Finally, Wang et al. (2017) showed that childhood maltreatment predicts online bullying, and moral disengagement is an amplifying moderator in this relationship.

Research ′ goal

Morality could be among the key mechanisms underlying the link between ACEs and antisocial behavior. But this relationship isn't well researched. Before more complex models of ACEs, morality, and anti-social tendencies and behaviors are built, we argue that more fundamental grounding work is needed. Thus, this research aims to make an exploratory insight into the relationship between the ACEs and morality, relying upon two arguably best of both models – CDC-Kaiser Permanente ACE model (as revised by Finkelhor et al., 2015) and Graham's MFT (Graham et al., 2011).

Method

Sample and procedure

The survey was conducted online and anonymously, on a convenience sample of 432 Bosnia and Herzegovina participants, with an average age of 25.91 (*SD*=9.16) years, mostly (71%) self-identifying as women.

Instruments

ACEs were measured using the revised ACE-14 questionnaire (Finkelhor et al., 2015), comprised of 14 categories of neglect, abuse, and family dysfunction, that might occur before turning 18. Participants mark the answers that reflect their experiences. Adding all the answers produces a total ACE score.

The moral criteria were measured by the MFQ-30 questionnaire (Graham et al., 2011), which comprises five basic moral criteria/foundations of the MFT theory. The questionnaire has two parts, each measuring all five

foundations differently. We used the first question collection (15 items minus one filler) – participants are asked to rate the different circumstances when deciding on the morality of the deed, by using a scale from "not at all relevant" to "extremely relevant".

Statistical analyses

The Bayes factor (BF_{10}), defined as the ratio of the likelihood of the H_A versus the H_0 (Jarosz & Wiley, 2014), was used in addition to the raw *p* values when judging the significance of Pearson's correlations (*r*), as it does not require corrections for multiple comparisons.

Results

Results are given in Table 1. There are small but significant, negative correlations between the ACE score and all the Binding facets of morality: Loyalty, Sanctity, and Authority. There are no significant correlations between the ACE score and the Individualizing moral facets (albeit with a marginal indication of a negative correlation with the Fairness criteria).

Table 1: Correlations between the total ACE score and dimensions of the MFT

MFT dimensions		ACE score
Care	r	-.07
	p	.13
	BF_{10}	0.19
Fairness	r	-.10
	p	.04
	BF_{10}	0.55
Loyalty	r	-.24
	p	<.001
	BF_{10}	>100
Authority	r	-.18
	p	<.001
	BF_{10}	69.17
Sanctity	r	-.22
	p	<.001
	BF_{10}	>100

Note: Statistical significance of Pearson's correlations (*r*) can be judged by either low *p*s (i.e., *p*<.05) or high BF_{10}s (e.g., ≥10).

Discussion

This research aimed to add insight into the understudied relationship between ACEs and morality. The results imply that higher ACEs are related to a slight but significant decrease in reliance on the binding moral criteria, with no associations with the individualizing moral criteria. Binding moral foundations aim to maintain social unity, i.e., they reflect the importance of belonging to groups and institutions

(Bobbio et al., 2011). In other words, the sense of "broken trust" in family and society, which arguably allowed the ACEs to happen, could to some degree diminish the perceived importance of community norms, while not necessarily diminishing the perceived importance of individualizing moral criteria. This solidifies our initial intuition that a proper theoretical morality framework (such as the MFT; Graham et al., 2011) could perhaps "fill the hole" and help explain the inconsistencies in the ACE-morality research, given the clear theoretically meaningful delineation between the aspects of MFT moral judgments that could be negatively influenced by the ACEs and the ones that should not necessarily be affected by them.

This also calls for further research centering on morality as a potential conditional link between the ACEs and antisocial tendencies, as different moral compasses are probably influenced differently by childhood maltreatment – potentially leading to different antisocial and criminal outcomes. Such research could uncover underlying mechanisms and potential rehabilitative or preventive steps in working with offenders and/or victims of childhood maltreatment.

References

Anda, R. F., Butchart, A., Felitti, V. J., & Brown, D. W. (2010). Building a framework for global surveillance of the public health implications of adverse childhood experiences. *American Journal of Preventive Medicine*, *39*(1), 93–98. https://doi.org/10.1016/j.amepre.2010.03.015

Bartels, D. M., & Pizarro, D. A. (2011). The mismeasure of morals: Antisocial personality traits predict utilitarian responses to moral dilemmas. *Cognition, 121*(1), 154–161. https://doi.org/10.1016/j.cognition.2011.05.010

Bobbio, A., Nencini, A., & Sarrica, M. (2011). Il Moral Foundation Questionnaire: Analisi della struttura fattoriale della versione italiana. *Giornale di Psicologia, 5*(1), 7–18.

Doğruyol, B., Alper, S., & Yilmaz, O. (2019). The five-factor model of the moral foundations theory is stable across WEIRD and non-WEIRD cultures. *Personality and Individual Differences*, 151(1), Article 109547. https://doi.org/10.1016/j.paid.2019.109547

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. *American Journal of Preventive Medicine*, *14*(4), 245–258. https://doi.org/10.1016/s0749-3797(98)00017-8

Finkelhor, D., Shattuck, A., Turner, H., & Hamby, S. (2015). A revised inventory of adverse childhood experiences. *Child Abuse & Neglect, 48,* 13–21. https://doi.org/10.1016/j.chiabu.2015.07.011

Fox, B. H., Perez, N., Cass, E., Baglivio, M. T., & Epps, N. (2015). Trauma changes everything: Examining the relationship between adverse childhood experiences and serious, violent, and chronic juvenile offenders. *Child Abuse & Neglect*, *46*, 163–173. https://doi.org/10.1016/j.chiabu.2015.01.011

Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of Personality and Social Psychology*, *101*(2), 366–385. https://doi.org/10.1037/a0021847

Greene, J. D., Sommerville, R. B., Nystrom, L. E., Darley, J. M., & Cohen, J. D. (2001). An fMRI investigation of emotional engagement in moral Judgment. *Science*, *293* (5537), 2105–2108. https://doi.org/10.1126/science.1062872

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., Jones, L., & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis. *The Lancet Public Health,* *2*(8), e356–e366. https://doi.org/10.1016/S2468-2667(17)30118-4

Jarosz, A. F., & Wiley, J. (2014). What are the odds? A practical guide to computing and reporting Bayes factors. *The Journal of Problem Solving, 7*(1), 2–9. https://doi.org/10.7771/1932-6246.1167

Kahane, G., Everett, J. A., Earp, B. D., Farias, M., & Savulescu, J. (2015). 'Utilitarian' judgments in sacrificial moral dilemmas do not reflect impartial concern for the greater good. *Cognition*, 134, 193–209. https://doi.org/10.1016/j.cognition.2014.10.005

Keleman, A., Lugonja, L., Subotić, S., & Dimitrijević, S. (2019). Trolley problem: Psychopathy or virtue? In K. Damnjanović, O. Tošković & S. Marković (Eds.), *Proceedings of the XXV scientific conference: Empirical studies in psychology* (pp. 35–37). Belgrade, RS: University of Belgrade, Faculty of Philosophy.

Levenson, J. S., Willis, G. M., & Prescott, D. S. (2014). Adverse childhood experiences in the lives of male sex offenders. *Sexual Abuse*, *28*(4), 340–359. https://doi.org/10.1177/1079063214535819

Levenson, J., & Grady, M. (2016). Childhood adversity, substance abuse, and violence: Implications for trauma-informed social work practice. *Journal of Social Work Practice in the Addictions*, *16*(1-2), 24–45. https://doi.org/10.1080/1533256x.2016.1150853

Maschi, T., Baer, J., Morrissey, M. B., & Moreno, C. (2013). The aftermath of childhood trauma on late-life mental and physical health: A review of the literature. *Traumatology*, 19(1), 49–64. https://doi.org/10.1177/1534765612437377

Reavis, J., Looman, J., Franco, C., & Rojas, B. (2013). Adverse childhood experiences and adult criminality: How long must we live before we possess our own lives? *The Permanente Journal*, *17*(2), 44–48. https://doi.org/10.7812/tpp/12-072

Topitzes, J., Mersky, J. P., & Reynolds, A. J. (2012). From child maltreatment to violent offending. *Journal of Interpersonal Violence*, *27*(12), 2322–2347. https://doi.org/10.1177/0886260511433510

Tripodi, S. J., & Pettus-Davis, C. (2013). Histories of childhood victimization and subsequent mental health problems, substance use, and sexual victimization for a

sample of incarcerated women in the US. *International Journal of Law and Psychiatry*, *36*(1), 30–40. https://doi.org/10.1016/j.ijlp.2012.11.005

Wang, X., Yang, L., Gao, L., Yang, J., Lei, L., & Wang, C. (2017). Childhood maltreatment and Chinese adolescents' bullying and defending: The mediating role of moral disengagement. *Child Abuse and Neglect, 69*(59), 134–144. https://doi.org/10.1016/j.chiabu.2017.04.016

Xiang, Y., Cao, Y., & Dong, X. (2020). Childhood maltreatment and moral sensitivity: An interpretation based on schema theory. *Personality and Individual Differences, 160*(1), Article 109924. https://doi.org/10.1016/j.paid.2020.109924

Xiang, Y., Chen, D., & Zhao, J. (2020). How is childhood abuse associated with moral disgust? The mediating role of social support and gratitude: Based on the theory of mind. *Journal of Aggression*, *Maltreatment & Trauma*, *30*(8), 1028–1040. https://doi.org/10.1080/10926771.2020.1806974

PSYCHOLOGY OF EDUCATION

Differences in The Level of Expression of Positive Attitude Towards Inclusion Between Educators and Students of Vocational Studies for Educators

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Abstract

Inclusion in practice often means only the physical involvement of the child, but not his actual presence in the activities. The aim of the research was to examine the attitude of educators of preschool institutions in Serbia and students of vocational schools for educators towards inclusion, as well as to examine the differences between these two groups of respondents. The difference in the level of expression of a positive attitude towards inclusion in relation to sociodemographic and control variables of research (age, education, number of attended training, institution where he works, experience in working with children with developmental disabilities) was also examined. Attitudes towards inclusion were measured through an adapted validated scale used in the previous research, which consisted of three subscales (Cognitive component of attitude, Conative component of attitude, and Sense of competence of educators). The scale ranges from 1 to 5. The research was conducted on a sample of 155 respondents, of which 102 (65.8%) are educators, and 53 (34.2%) are students. The research showed that the respondents have a positive attitude towards inclusion in the global (AS=3.60; SD=0.51), but also on the subscales (AS=3.09; SD=0.50; AS=4.10; SD=0.74 and AS=3.85; SD=0.69). Furthermore, the conducted analyses showed that there is no statistically significant difference between educators and students in the level of expression of a positive attitude towards inclusion, nor on the subscales. When it comes to control and sociodemographic variables, the difference between certain categories of socio-demographic variables and attitudes towards inclusion shows that teachers with fewer trainings have less knowledge about inclusion, but also a more positive attitude about inclusive education, Also, teachers from private institutions and those who have a child with developmental difficulties in their experience have a more positive attitude towards inclusion.

Keywords: inclusion, educators, high school students for educators, training, attitude

Introduction

All children have the right to meet their peers, to socialize with them, to learn together and from each other; to grow up in a supportive environment; to go out into the world and explore it, with the full support of parents, guardians and educators within a safe environment characterized by a caring educational approach. According to the perspective of children's rights, upbringing and education at an early age are a goal and a right in themselves and should not be seen only as a means to achieve a distant goal such as developing children's potential (Woodhead, 2006).

Organized programs of upbringing and education at an early age function as an important educational environment for all children; they do not replace parents and the family environment, but insist on joint and complementary teaching of children. What organized preschool education programs offer children cannot be provided by their families and vice versa. Preschool education programs can serve as a bridge that connects the home environment and the outside world. Recent research confirms that the employment of mothers and the attendance of preschool education in kindergartens (preschool institutions) do not in any way negatively affect children if the programs are of appropriate quality and the institutions are regulated and controlled by law (Booth, 2010).

It is on these principles that the idea of inclusive education rests. Accessibility and the chance for development given equally to everyone are the main backbones of this model. As the educator is someone who corresponds between the child and the system, his attitude towards the process of upbringing and education is an important factor in the child's development. The philosophy of integration and inclusion, as well as their difference, is best reflected in the fact that integration means that a child with disabilities is transferred to a class with other children and that he is expected to absolutely adapt and assimilate. (Дмитровић, 2011).

The aim of the research was to examine the attitude of educators of preschool institutions in Serbia and students of vocational schools for educators towards inclusion, as well as to examine the differences between these two groups of respondents. The difference in the level of expression of a positive attitude towards inclusion in relation to sociodemographic and control variables of research (age, education, number of attended trainings, institution where he works, experience in working with children with developmental disabilities) was also examined.

In order to examine the relationship between inclusive concepts and sociodemographic variables, the following hypotheses were tested:

H1: Positive attitude towards inclusive education is highly expressed.

H2: There are statistically significant differences in the level of expression positive attitude towards inclusion (scale and subscale) between educators and students of vocational studies for educators.

H3: There is a statistically significant difference, ie correlation, of a positive attitude towards inclusion (scale and subscale) in relation to sociodemographic research variables (age, education, number of trainings attended, institution where he works, experience in working with children with disabilities).

Method

The research was conducted on a sample of 155 respondents, of which 102 (65.8%) are educators, while 53 (34.2%) are students. There were more female respondents in the sample (150; 96.8%) and the average age of the respondents was 35.28 (range 18-60).

Scale

Instrument: The scale of attitudes about inclusion, which will be taken from the research "Attitudes of class and subject teachers towards the inclusive education of children with special needs" (Jovanovic, 2009). The scale was constructed for the purpose of measuring the intensity and direction of the attitude toward inclusive teacher education. The first part of the scale was created so that the scale includes items related to the cognitive component, then items related to the conative component and items related to the teacher's sense of competence. The sum of these components gives an attitude toward inclusive education. The questionnaire consists of a five-point scale, Likert type, and has 21 items.

The research showed that the respondents have a positive attitude towards inclusion in the global (AS = 3.60; SD = 0.51), but also on the subscales (AS = 3.09; SD = 0.50; AS = 4.10; SD = 0.74 and AS = 3.85; SD = 0.69). The distribution of the respondents' answers deviated statistically from normal ($p < 0.01$), so non-parametric techniques were applied, i.e. Spearman's Ro correlation coefficient and Man-Whitney U test and Krushkal Wallis test.

Results

The research showed that the respondents have a positive attitude towards inclusion in the global (AS = 3.60; SD = 0.51), but also on the subscales (AS = 3.09; SD = 0.50; AS = 4.10; SD = 0.74 and AS = 3.85; SD = 0.69).

Table 1: Descriptive statistics

minimum	maximum	mean	SD[1]
ATTITUDE TOWARD INCLUSION			
1,96	4,67	3,60	0,51
Cognitive component			
1,56	4,22	3,09	0,49
Conative component			
1,50	5	4,10	0,74
Sense of competence of educators			
2	5	3,85	0,69

Furthermore, the conducted analyses showed that there is no statistically significant difference between educators and students in the level of expression of a positive attitude towards inclusion, nor on the subscales. When it comes to control and sociodemographic variables, differences were obtained on the Cognitive component ($\chi2 = 11.77$; df = 3; $p = 0.01$) and on the whole scale Attitude towards inclusion

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[1] Standard deviation

($F = 2.54$; df = 3; $p = 0.05$), in the case of the number of trainings that respondents attended. Respondents who attended 5-10 trainings compared to them who didn't attend any (46.68; $p = 0.01$), and those who attended up to 5 (51.03; $p = 0.01$) have more knowledge of what inclusion represents. Respondents with a smaller number of trainings have a more positive attitude towards inclusive (respondents with 5-10 trainings vs. without trainings (-0.38; $p = 0.03$) and those with up to 5 (0.47; $p = 0.01$)).

Furthermore, the difference on the same subscale and scale was obtained when it comes to the institution in which the respondent works (Cognitive component $\chi2 = 7.15$; df = 2; $p = 0.03$; Attitude towards inclusion $F = 3.03$; df = 3; $p = 0.05$). In both cases, respondents from a private preschool lead. They have more knowledge about inclusive (-52.07; $p = 0.03$) and their attitude is more positive (-0.54; $p = 0.02$). Educators who have experience with a child with developmental difficulties feel more competent ($U = 2316.00$, $p = 0.02$). The connection between the age and education and the attitude towards inclusive (and its subscales) has not been obtained.

Discussion and Conclusion

There seems to be a broad consensus that teachers 'attitudes towards inclusion are critical in pursuing the ambitious goal of inclusive schools in making these strategies successful (Avramidis, Norwich, 2002). Attempts to identify factors related to teachers' attitudes towards inclusion have so far yielded mixed results, although there are some significant trends that indicate that the severity of disability, access to support and perceived competence are all important factors. Thus, the results of new studies further contribute to the accumulation of knowledge that can unpack a complex pattern of factors to consider in order to promote positive attitudes toward inclusive schools (Falkmer, Anderson, Joosten, 2013). What is important, and what we have tried with this research, is to provide a greater insight into the importance, age, years of experience, years of experience working with children with developmental disabilities, and targeted training.

The obtained scores on the presented variables show that the educators from the sample have a highly expressed positive attitude towards Inclusion, which confirmed the first research hypothesis (H1).

Further analyzes show that the difference in the level of expression of a positive attitude between educators and students was not obtained, which did not confirm the second research hypothesis (H2).

The difference between certain categories of socio-demographic variables and attitudes towards inclusion shows that teachers with fewer trainings have less knowledge about inclusion, but also a more positive attitude about inclusive education,

Also, teachers from private institutions and those who have a child with developmental difficulties in their experience have a more positive attitude towards inclusion. The obtained results are in line with previous research

(Moltó, Cristina, Florian, Rouse, Stough, 2010; Meijer, Foster, 1988; Savolainen, 2012) and partially confirm the third research hypothesis (H3).

The differences between students and teachers that were not obtained can be explained by the topicality of the topic of inclusion and its presence both among students and among practitioners.

The basic conclusion that emerges here is that previous experience with a child with disabilities and the number of trainings that the practitioner attends is a key element that shapes the attitude towards inclusion.

The contribution of the conducted study is reflected in informing practitioners about the limitations they may encounter when working with children with developmental disorders. Such insight allows them to recognize their "critical points" and to work on them.

References

Avramidis E, Bayliss P, Burden R. 2000 A survey into mainstream teachers' attitudes towards the inclusion of children with special educational needs in the ordinary school in one local education authority. *Educational Psychology*.;20(2):191–211.

Booth, T., Ainscow, M. (2010). *Priručnik za inkluzivni razvoj škole* (upotreba Indeksa za inkluziju za razvoj inkluzivne kulture, politike i prakse). Beograd: ZVKOV. Дмитровић, П. (2011). Предувети за примену инклузије. *Методички обзори*, 6(13), 69–82.

Falkmer M, Anderson K, Joosten A, Falkmer T. (2013) Parents' perspectives on inclusive schools for children with Autism Spectrum Conditions: A systematic literature review. *International Journal of Disability, Development, & Education.;*62(1):1–23.

Jovanović, O. (2009) *Stavovi nastavnika razredne i predmetne nastave prema inkluzivnom obrazovanju djece sa posebnim potrebama.* Beograd: Filozofski fakultet, Diplomski rad.

Meijer CJW, Foster SF. 1988, The effect of teacher self-efficacy on referral chance. *The Journal of Special Education.*;22(3):378–85.

Moltó C, Cristina M, Florian L, Rouse M, Stough LM. 2010., Attitudes to diversity: a cross-cultural study of education students in Spain, England and the United States. *European Journal of Teacher Education.*;33(3):245–64

Savolainen H, Engelbrecht P, Nel M, Malinen P. 2012., Understanding teachers' attitudes and self-efficacy in inclusive education: implications for pre-service and in-service teacher education. *European Journal of Special Needs Education.*;27(1):51–68.

Woodhead, M. (2006), *Changing perspectives on early childhood: theory, research and policy,* UNESCO, Education for All, (2007/ED/EFA/MRT/PI/33/REV).

What Came First? Exploring Directions of Influence among Academic Emotions, Mathematics Identity and Achievement

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Abstract

The importance of academic emotions and mathematics identity for academic achievement is well-known, but the relationship between them is unclear. The study aimed to test if academic emotions (enjoyment, anxiety and boredom) mediate the relationship between mathematics identity and achievement or if that relationship is different. The sample consisted of 437 third-, fourth- and fifth-grade students in primary schools across Belgrade. We specified two path models to test the direction of this influence. The model proposing mathematics identity as a mediating variable between emotions and achievement had a significantly better fit. Mathematics identity had a small to medium effect on mathematics achievement. Enjoyment had the most critical impact on mathematics identity, which is still developing for these age groups, while anxiety had a significant but small effect. Such results stress the importance of creating a school environment where learning and participating in math class can evoke a sense of enjoyment.

Keywords: academic emotions, mathematics identity, mathematics achievement

Introduction

An increasing number of literature was focused on the importance of academic emotions (AE) for academic achievement (e.g., Peixoto et al., 2017; Putwain et al., 2017; Schukajlow, Rakoczy & Pekrun, 2017). AE are related to academic, work, or sports achievement activities or their success and failure outcomes (Pekrun, 2006; Pekrun & Perry, 2014). Three emotions that are primarily in focus due to the frequency of their occurrence in achievement-related situations are anxiety, boredom and enjoyment.

Most studies confirmed a positive relationship between enjoyment and academic achievement, while anxiety and boredom are negatively related with achievement (Camacho-Morles, 2021; Pekrun et al. 2017; Putwain et al., 2017; Putwain et al., 2020; Zhang, Zhao & Kong, 2019).

One additional construct that is gaining greater attention is academic identity (Bohrnstedt et al., 2020; Darragh, 2013; Eccles, 2009; Master, Cheryan & Meltzoff, 2016). In this context, mathematics identity (MI) can be defined as a set of

beliefs about one's self as a mathematics learner and a perception of how others see a person in the context of mathematics (Anderson, 2007; Nosek et al., 2002). Previous studies show that academic identity significantly affects academic achievement when considering motivational constructs like competency beliefs, values, cost, and self-efficacy (Bohrnstedt, 2020; Perez, Cromey & Kaplan, 2014; Vincent-Ruz & Schunn, 2018).

Although the connection between AE and achievement and MI and achievement is well known, the relationship between the three constructs is less clear, especially among younger students in primary school. The current study is part of an international project Co-constructing mathematics motivation in primary education- A longitudinal study in six European countries (MATHMot[1]), focusing on children's motivation for learning math. This study aimed to test whether AE mediate the relationship between MI and mathematics achievement or if that relationship is different.

Method

Sample and procedure

The sample was convenient and consisted of 437 third-, fourth- and fifth-grade students (33% third grade students, 39% fourth grade students, 49% male) in primary schools across Belgrade. The survey was administered in the paper-and-pen format during regularly scheduled classes by school psychologists and teachers trained by the researchers.

Instruments

Academic emotions related to mathematics: Boredom, Anxiety and Enjoyment, were measured with the AEQ-ES scale (Lichtenfeld et al., 2012), which consisted of 28 5-point Likert scale items.

The mathematics identity scale consisted of 6 items from the Mathematics Identity Scale, developed for the purposes of this project. The scale was adapted and further developed, inspired by the work of Vincent-Ruz et al. (2018) and Miller

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& Wang (2019). Items were answered on a 4-point Likert scale ranging from 1, never to 4, a lot of times.

Finally, each grade's **mathematics test** covering major curricular topics was used to measure achievement.

Data analysis

The relationship between AE, MI and achievement, was analysed by two structural equation models (SEM) specified in AMOS. In the first model we assumed that MI affects AE, which in turn affect achievement. The second model assumes that AE affect MI, which then impacts achievement (please see Figure 1).

Results

Fit measures showed a poorer fit of model 1 (χ^2/df = 9.66, RMSEA = .14, CFI = .98, NFI = .77, TLI = .77).
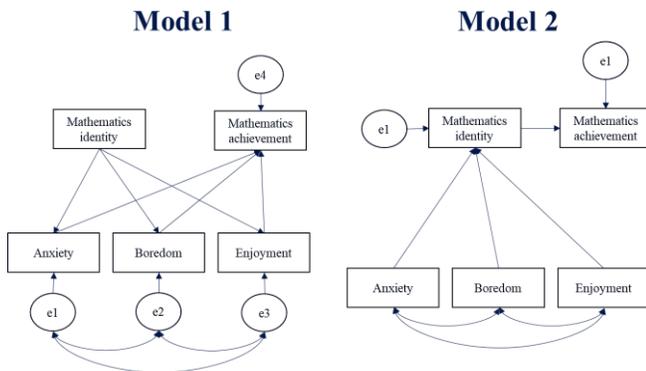

Figure 1: Path models

The second model had significantly better fit statistics ($\chi2$/df = 1.84, RMSEA = .04, CFI = .99, NFI = .99, TLI = .98).

Boredom did not significantly influence identity ($r = .04$, $p = .53$). Anxiety had a small negative impact ($r = -.13$, $p = .02$), while Enjoyment had a large positive impact ($r = .43$, $p = .00$) on MI[2]. Finally, MI positively influenced achievement ($r = .22$, $p = .00$). It seems that emotions, especially Enjoyment, significantly impact academic achievement through MI, not vice versa.

Since our path models confirmed importance of MI, we wanted to test potential differences in MI based on gender and grade with chi-square test. First 25% of students with the lowest identity scores were classified as "students with low MI". The next 50% were classified as "students with medium MI". Finally, 25% of students with the highest identity score were classified as "students with high MI". There was a significant association between MI and gender and grade χ^2 (4) = 13.537, $p = .00$. With the transition from fourth to fifth grade a significant increase of boys with low MI and significant decrease of girls with high MI is noticed (Figure 2).

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[2] We used benchmarks recommended by Gignac and Szodorai (2016) of .15, .25, and .35 to indicate small, moderate, and large effect size magnitudes.
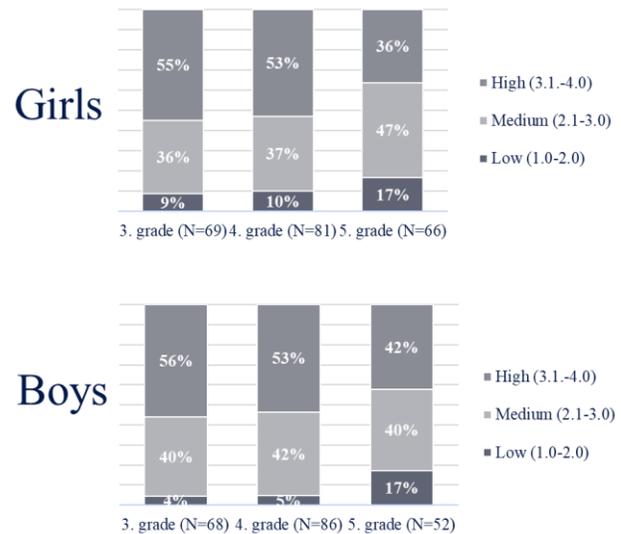
Figure 2: Percentage of girls and boys in third, fourth and fifth grade with high, medium and low mathematics identity

Discussion and Conclusion

Having in mind the disagreement about whether emotional constructs drive identity development or direction is vice versa, the aim of our study was to test two path models. Based on a model that had a greater fit, it was concluded that enjoyment, anxiety and boredom affect MI, which further affects achievement.

A critical and distinctive impact of mathematics and science identity on academic achievement and the academic experience was confirmed in previous studies (Bohrnstedt, 2020; Vincent-Ruz & Chunn, 2018). However, in these studies, the impact of identity was examined in the context of motivational constructs and among older students.

Besides demonstrated importance of MI for the school outcome, research indicates that at the age of nine, ten and eleven, MI is still developing and is under the influence of AE. The fact that enjoyment has a significant positive effect on MI implies just how important it is to create a school environment where learning and participating in mathematics will evoke a sense of enjoyment. However, the significant positive impact of enjoyment and a small negative effect of anxiety could also be related to our participants' ages. Previous studies show that the relation between anxiety and achievement is more substantial for secondary and upper secondary school students, while enjoyment tends to decrease in older grades (Camacho-Morles et al., 2020; Zhang, Zhao & Kong, 2019). Boredom was the only emotion that didn't significantly impact identity, which could also be due to developmental effects (i.e., boredom being less present among primary school students compared to older ones).

Expectedly, MI decreased during the transition from fourth to fifth grade. The number of girls with high MI dropped from 53% in 4th to 36% in 5th grade. On the other hand, boys had an increase of students with low MI (from 5% in 4th grade to 17% in 5th grade). The decline of students with high MI should be further examined, especially among girls for whom identity could play a more significant role in shaping participation in mathematics (Vincent-Ruz & Schunn, 2018).

Finally, there are several limitations of the study that should be taken into account. The results are based on the cross-sectional study, so there is a need for validation of the model based on longitudinal data. Furthermore, the same students reported on all variables, which could lead to shared method bias (Miller & Wang, 2019). This can be overcome by measuring the same variable from different respondents (e.g., teacher, parent and student report) or by adding additional methods.

The future research model should include motivational constructs in addition to AE and MI to test if the importance and relation between AE, MI and achievement would remain or change.

References

Anderson, R. (2007). Being a mathematics learner: four faces of identity. *The Mathematics Educator*, *17*, 7–14. https://files.eric.ed.gov/fulltext/EJ841557.pdf.

Bohrnstedt, G. W., Zhang, J., Park, B. J., Ikoma, S., Broer, M. & Ogut, B. (2020). Mathematics Identity, Self-efficacy and Interest and Their Relationship to Mathematics Achievement: A Longitudinal Analysis. In R. T. Serpe, R. Stryker & B. Powell (Eds.), *Identity and Symbolic Interaction.* Cham: Springer.

Camacho-Morles, J., Slemp, G. R., Pekrun, R., Loderer, K., Hou, H., & Oades, L. G. (2021). Activity Achievement Emotions and Academic Performance: A Meta-analysis. *Educational Psychology Review, 33,* 1051-1095. https://doi.org/10.1007/s10648-020-09585-3

Darragh, L. (2013). Constructing confidence and identities of belonging in mathematics at the transition to secondary school. *Research in Mathematics Education, 15(3),* 215-229. http://dx.doi.org/10.1080/14794802.2013.803775

Eccles, J. (2009). Who Am I and What Am I Going to Do with My Life? Personal and Collective Identities as Motivators of Action. *Educational Psychologist, 44(2),* 78-89. https://doi.org/10.1080/00461520902832368

Gignac, G. E., & Szodorai, E. T. (2016). Effect size guidelines for individual differences researchers. *Personality and Individual Differences*, 102, 74–78. https://doi.org/10.1016/j.paid.2016.06.069

Kogler, K. & Gollner, R. (2018). Control-value appraisals predicting students' boredom in accounting classes: a continuous-state-sampling approach. *Empirical Research in Vocational Education and Training, 10 (4).* https://ervet-journal.springeropen.com/articles/10.1186/s40461-018-0065-8.

Lichtenfeld, S., Pekrun R., Stupinsky, R. H., Reiss, K. & Murayama, K. Measuring students' emotions in the early years: The Achievement Emotions Questionnaire-Elementary School (AEQ-ES) (2012). *Learning and Individual Differences, 22,* 190-201. https://doi.org/10.1016/j.lindif.2011.04.009

Master, A., Cheryan, S., & Meltzoff, A. N. (2016). Motivation and identity. In K. R. Wentzel & D. B. Miele (Eds.), *Handbook of motivation at school* (pp. 300-319). New York.

Miller, R. S. & Wang, M. (2019). Cultivating Adolescents' Academic Identity: Ascertaining the Mediating Effects of Motivational Beliefs Between Classroom Practices and Mathematics Identity. *Journal of Youth and Adolescence, 48,* 2038-2050. https://doi.org/10.1007/s10964-019-01115-x

Nosek, B. A., Banaji, M. R., & Greenwald, A. G. (2002). Math = me, me = female, therefore math ≠ me. *Journal of Personality and Social Psychology*, *83*, 44–49. https://www.researchgate.net/publication/11287650_Math_male_me_female_therefore_math_me.

Peixoto, F., Mata, L., Monteiro, V. & Sanches, C. (2017). "How do you feel about Math?": Relationships between Competence and Value Appraisals, Achievement Emotions and Academic Achievement. *European Journal of Psychology of Education, 32(3),* 385-405. https://doi.org/10.1007/s10212-016-0299-4

Pekrun, R. (2006). The Control-Value Theory of Achievement Emotions: Assumptions, Corollaries, and Implications for Educational Research and Practice. *Educational Psychology Review, 18,* 315-341. https://doi.org/10.1007/s10648-006-9029-9

Pekrun, R. & Perry, R. P. (2014). Control-value theory of achievement emotions. In R. Pekrun & L. Linnenbrink-Garcia (Eds.), *International handbook of emotions in education* (pp. 120-141). New York, NY: Routledge.

Perez, T., Cromley, J. G. & Kaplan, A. (2014). The Role of Identity Development, Values, and Costs in College STEM Retention. *Journal of Educational Psychology, 106(1),* 315-329. https://doi.org/10.1037/a0034027

Putwain, D. W., Becker, S., Symes, W., & Pekrun, R. (2017). Reciprocal relations between students' academic enjoyment, boredom, and achievement over time. *Learning and Instruction, 54,* 73-81. https://doi.org/10.1016/j.learninstruc.2017.08.004

Putwain, D. W., Schmitz, E. A., Wood, P. & Pekrun, R. (2020). The role of achievement emotions in primary school mathematics: Control-value antecedents and achievement outcomes. *British Journal of Educational Psychology, 91(1),* 347-367. https://doi.org/10.1111/bjep.12367

Schukajlow, S., Rakoczy, K. & Pekrun, R. (2017). Emotions and motivation in mathematics education: theoretical considerations and empirical contributions. *Mathematics Education, 49,* 307-322. https://doi.org/10.1007/s11858-017-0864-6

Vincent-Ruz, P. & Schunn, C. D. (2018). The nature of science identity and its role as the driver of student choices. *International Journal of STEM Education, 5*(48). https://doi.org/10.1186/s40594-018-0140-5

Zhang, J., Zhao, N. & Kong, P. Q. (2019). The Relationship Between Math Anxiety and Math Performance: A Meta-Analytic Investigation. *Frontiers in Psychology, 10.* https://doi.org/10.3389/fpsyg.2019.01613

Learning Strategies during Covid-19 Pandemic: How Well Do They Predict School Achievement and How Do They Differ in Classroom and Remote-Learning Situation?

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Abstract

Considering the fact that the Covid-19 pandemic has called for the urgent adaptation of the remote-learning environment and hence the modification of learning habits, the aim of this research was to examine which learning strategies the secondary high-school student use during this transition and how well these strategies predict school achievement. Four subscales were adapted from the MSLQ questionnaire and administered to 135 students (82% of girls; M_{age}=16; SD_{age} = .64), as well as one open-ended question regarding the difference between learning in the classroom and remote learning situations. Results showed that only Elaboration was a statistically significant predictor of school achievement, while conducted qualitative analysis of the answers revealed that students find the classroom environment to be more stimulating and beneficial to their learning, suggesting that the elaborative learning is a prerequisite when it comes to school achievement ant the remote-learning should be more engaging.

Keywords: learning strategies; elaboration; remote learning; school achievement

Introduction

Since the outburst of the Covid-19 pandemic, schools all over the world have been forced to implement and adapt to the remote-learning environment, soon realizing that the traditional classroom setting is diametrically different when transposed online. Both students and teachers were faced with numerous issues regarding online education (Moralista & Oducado, 2020; Tria, 2021), while studies shed the light on two major groups of problems that were recurrent in the transition period. Not only did the student report increasing levels of anxiety and academic stress (Baloran, 2020), but they also reported that their learning has overall worsened (Chen et al., 2020). Bearing in mind that self-regulated learning strategies (e.g. planning, monitoring, etc.) are considered to be even more important in a distance learning environment than in a traditional learning setting (Dabbagh & Kitsantas, 2004), the aim of this study was to: (1) explore which learning-strategies the secondary high-school students use in a newly adapted environment; (2) examine how well do these strategies predict school achievement?; (3) and finally compare these strategies and look into how they differ in the newly created environment.

Method

Sample and procedure

A convenient sample was collected by the snowball method, comprising 135 secondary school students – 1st to 3rd grade (82% of girls; M_{age}=16; SD_{age}=.64). Prior to filling out the survey, students were asked to give out information regarding their school achievement at the end of the previous grade, ranging from satisfying (mark 2; .7%), good (mark 3; 26.7%), very good (mark 4; 54.8%) and excellent (mark 5; 17.8%). The survey was administered via GoogleForms online software, while informed consent was obtained from all participants in the study.

Measures

MLSQ (Motivated Strategies for Learning Questionnaire; Pintrich et al., 1993) represents a self-report Likert-scale instrument designed to assess students' motivation and usage of different learning strategies. Four subscales were obtained from the original instrument which measure cognitive and metacognitive learning strategies. The adapted questionnaire contained 26 questions, organized into four subscales which measure strategies of Elaboration (6 items; α =.77), Organization (4 items; α=.76), Critical thinking (5 items; α=.79) and Metacognitive self-regulation (11 items; α =.72). Students were instructed to rate each item on a 7-point Likert scale (1 – Does not apply to me at all, 7 – Completely applies to me), depending on how well sentences relate to how they learn and memorize school material.

One open-ended question was also included in the survey. Students were asked to explain the differences in how they learn when classes are carried out in school and online. The question stated: „*Is there a difference in how you learn (e.g. how you organize your time, how you memorize, what learning strategies you use) when teaching is live and when it is online? Please explain the difference.*"

Data analysis

Linear multiple regression analysis was conducted using SPSS software (*SPSS*, v. 25). Summary scores for each of the four learning strategies subscales were inputted as

predictor variables. The criterion variable was the school achievement students reported they had had at the end of the previous grade, operationalized through the numerical mark linked to the category of achievement. Content analysis of the students' answers to the open-ended question was also conducted by singling out the differences that students mentioned. Each difference was registered and coded either as the pro or the con for both learning environments. Qualitatively similar differences were then grouped into a broader code and each code was then counted.

Results

Descriptive parameters of average scores regarding four learning strategies are shown in Table 1. High means and statistically significant negative standardized skewness suggest that the most used strategy among students is Elaboration, followed by Organization, while the least used one is metacognitive self-regulation. Scores were later transformed in order to ensure data normality for future analysis.

Table 1: Descriptive parameters of average scores

	M	Sd	zSk	zKu	KS
Elaboration	5.60	1.12	-.401**	.45	.116**
Organization	4.92	1.51	-3.27**	.50	.093**
Critical thinking	3.99	1.36	-.028	-1.57	.076**
Metacognitive self-regulation	4.50	.97	-0.98	-.70	.071**

Note. Zsk = standardized skewness; *zKu* = standardized kurtosis; *KS* = KolmogorovSmirnov statistic

The results of multiple linear regression analysis showed that the regression model comprising four of the learning strategies is significant (R = .324, R^2 = .105, *p* <. 01), but also revealed that the Elaboration strategy is the only statistically significant predictor of school achievement as shown in Table 2.

Table 2: Learning strategies as predictors of school achievement

	B	SE	β	t	p
Elaboration	.23	.06	.37	3.60	.000
Organization	-.07	.04	-.15	-1.14	.141
Critical thinking	-.05	.04	-.10	-1.07	.285
Metacognitive self-regulation	.04	.07	.05	.51	.610

Results of qualitative analysis of the answers to the additional open-ended question regarding difference between learning in the classroom and remote-learning environment are shown in Table 3. Results revealed that students find that they better learn and monitor lectures in the traditional setting, as well as that they put into greater

cognitive effort and have better time management when compared with remote-learning setting.

Table 3: Frequencies of the codes regarding pros of classroom and remote-learning environment

	Cumulative frequency of code	
	Classroom	Remote-learning
Lecture monitoring	15	0
Cognitive effort	11	1
Free time	0	8
Overlearning	2	0
Material understanding	4	0
Time management	12	2
Studying on time	4	0
Learning quality	21	0
Examination quality	3	0
Teachers' engagement	5	0
Communication	4	0

Discussion

Results of this research indicated that elaborative learning was the only learning strategy that can predict school achievement in the remote-learning situation, showing that the more the strategy is used, the greater the achievement will probably be accomplished. What is more, it has shown that this is the most used strategy among students, which corresponds to prior studies that have shown that elaboration is the most utilized strategy in the remote-learning situation during the Covid-19 pandemic (Avila & Genio, 2020). This result pattern suggests that teachers should encourage students to engage in more elaborative learning and that students themselves should practice elaboration techniques while learning, which "*involve meaning-enhancing additions, constructions or generations that improve their memory for what is being learned*" (Levin, 1988: 191). This research has also shed the light on shortcomings of remote-learning environment, suggesting that students have reported much better monitoring and concentration in the classroom setting, greater understanding of the material, better class organization, as well as greater engagement and cognitive effort. These results are also in line with previous studies that point out that students have difficulties when learning via online platforms (Baloran, 2020; Chen et al., 2020). Contrary to these deficiencies, a remote-learning environment has been found better only for organizing free time and activities before and after school time. Results of qualitative analysis suggest that teachers should find a way to simulate a traditional environment via online learning platforms by finding a way to carry out lectures that are more engaging and involving. Future research should focus on exploring and implementing suggested practices online in order to examine their effect on students' motivation and achievement in the future.

References

Avila, E. C., & Genio, A. M. G. J. (2020). Motivation and learning strategies of education students in online learning during pandemic. Psychology and Education Journal, 57(9), 1608-1614. https://doi.org/10.17762/pae.v57i9.506

Baloran, E. T. (2020). Knowledge, attitudes, anxiety, and coping strategies of students during COVID-19 pandemic. Journal of loss and trauma, 25(8), 635-642. https://doi.org/10.1080/15325024.2020.1769300

Chen, T., Peng, L., Yin, X., Rong, J., Yang, J., & Cong, G. (2020, July). Analysis of user satisfaction with online education platforms in China during the COVID-19 pandemic. In Healthcare (Vol. 8, No. 3, p. 200). MDPI. https://doi.org/10.3390/healthcare8030200

Dabbagh, N. & Kitsantas, A. (2004). Supporting Self-Regulation in Student-Centered Web-Based Learning Environments. International Journal on E-Learning, 3(1), 40-47. Norfolk, VA: Association for the Advancement of Computing in Education (AACE). Retrieved from https://www.learntechlib.org/primary/p/4104/.

IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.

Levin, J. R. (1988). Elaboration-based learning strategies: Powerful theory= powerful application. Contemporary Educational Psychology, 13(3), 191-205. https://doi.org/10.1016/0361-476X(88)90020-3

Moralista, R. B., & Oducado, R. M. F. (2020). Faculty perception toward online education in a state college in the Philippines during the coronavirus disease 19 (COVID-19) pandemic. Universal Journal of Educational Research, 8(10), 4736-4742. https://doi.org/10.13189/ujer.2020.081044

Pintrich, P. R., Smith, D. A., Garcia, T., & McKeachie, W. J. (1993). Reliability and predictive validity of the Motivated Strategies for Learning Questionnaire (MSLQ). Educational and psychological measurement, 53(3), 801-813. https://doi.org/10.1177/0013164493053003024

Tria, J. Z. (2020). The COVID-19 Pandemic through the Lens of Education in the Philippines: The New Normal. International Journal of Pedagogical Development and Lifelong Learning, 1(1), ep2001. https://doi.org/10.30935/ijpdll/8311

Students' Perception of Teaching Practices and Parents' Educational Status as predictors of Students' Self-Efficacy in Televised Instruction

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Abstract

The outbreak of COVID-19 pandemic forced 1.6 billion students to switch to distance learning. More than 80 countries around the world, including Serbia, used televised instruction during the first wave of school closures (March-June, 2020). Given the indirect and asynchronous teaching and remote nature of learning in TV instruction, it brought concerns that students whose parents are less-educated can lag behind those from more educated parents. The main objective of this study is to examine the relative predictive effect of students' perception of teaching practices in TV classes (SPTP) and parents' educational status (PES) on one of the most important student outcomes - academic self-efficacy. The sample of 1202 compulsory education students evaluated the frequency of ten teaching practices in the science and humanities lessons they had just watched on TV (SPTP), as well as their self-efficacy about the lesson content. PES was measured as the sum of schooling years of parents. The results indicate that students' self-efficacy is more affected by their perception of teaching practices than by family educational status, although both predictors are significant.

Keywords: televised instruction; students' perception of teaching practices; students' self-efficacy; parent's educational status

Introduction

The outbreak of the COVID-19 pandemic caused the need for distance education for more than one and a half billion of students worldwide (UNICEF, 2020). In the first wave of school closures (March-June 2020) most countries (68% of 127 for which data are available) used some combination of digital and non-digital distance learning to expand the reach of children (UNICEF, 2020). The most common non-digital form of distance learning was televised instruction, which was used by 75% of the surveyed countries (*ibid*). TV instruction (telecourses, televised instruction) implies teaching through video, in which the learning of a particular subject is aligned with established curriculum and academic standards (Luskin, 1983).

In such a context, students had to "move" their learning activities from the classroom to their homes. To do this, they needed certain material, social and psychological resources that schooling did not necessarily require until then. These resources include wide range of possessions, starting with a quiet place at home where they can study/attend the lessons, electronic devices they can use for that purpose, as well as family support and personal dispositions that will enable them to remain engaged in learning activities. The absence of regular teacher-student interactions and the one-way nature of communication in televised instruction (from teacher to student) made it impossible for students to get teachers' feedback on their work and to get appropriate scaffolding. Also, the parents had to take over the role of support in learning and regulation of students' activities to a great extent. These facts brought concerns that students whose parents are less-educated can lag behind those from more educated parents. This concern is based on huge empirical evidence that parental education has strong and robust effect on student outcomes (Bos & Kuiper, 1999; Bradley & Corwyn, 2002; Campbell, Haveman, Wildhagen & Wolfe, 2008; Chiu & Xihua, 2008; Lamb & Fullarton, 2000; Marks, Cresswell & Ainley, 2006; Williams, 2006; according to Jakšić, Marušić Jablanović & Gutvajn, 2017). On the other side, numerous systematic reviews, meta-analyses, international studies of educational achievements (such as PISA and TIMSS) showed that the strongest factors of student outcomes beside those that come from the students themselves and their family are those that come from the teaching quality (Hattie, 2009, Ladd and Sorensen, 2015; Muijs & Reynolds, 2017; OECD, 2018). Given these two presumptions, the main objective of this study is to examine the relative predictive effect of students' perception of teaching practices in TV classes (SPTP) and parents' educational status (PES) on one of the most important students outcomes – academic self-efficacy.

Large-scale studies on representative samples of students in Serbia showed that self-efficacy is one of the best predictors of the test score in different subjects and age groups (Džinović & Vujačić, 2017; Jakšić et al., 2017; Jovanović, 2014; Pavlović –Babić, 2007). Self-efficacy is related not only to students' academic outcomes but also to socio-emotional outcomes (i.e. depression and anxiety) (Hattie, 2009), level of engagement, persistency and resistance when facing obstacles in given activity (Schunk, 2012). Therefore it is not surprising that, students who perceived themselves more self-efficient during COVID-19 emergency remote schooling perceived independent distance learning as less stressful, procrastinated less and had less need for support (Pelikan, et al, 2021).

Method

Procedure. The survey was conducted during May 2020 when respondents filled out an online questionnaire. The students anonymously gave general information about their grade, type of settlement they live in and family background. They evaluated the frequency of ten teaching

practices in the science and humanities lessons they had just watched, as well as their self-efficacy about the content of the lesson.

Sample. The sample included 1202 students, from primary (23.84% of sample) and lower secondary education (76.15% of sample) who watched TV lessons of science and humanities ($M = 5.64$, $SD = 1,74$). Gender representation was balanced (56% of participants were female), and 62% of respondents were from cities, while the rest lived in rural areas.

Measures. *Subject self-efficacy* (SSE) refers to the perception of one's own success in a given subject. It was measured with five statements adapted from the PISA 2009 questionnaire for students (e.g. I understand even the most difficult tasks in this subject; $\alpha = 0.83$). *Parental educational status* (PES) was measured as the sum schooling years of parents/guardians. *Students' Perception of Teaching Practices* (SPTP) was measured by a composite scale made of ten statements ($\alpha = 0.82$). We utilized the *Students' Views on Engaging Teaching* scale from TIMSS 2015 for TV instruction that is characterized by one-way communication (items implying interaction were replaced with a new one) and half of the statements were formulated negatively (The images that teacher uses are incomprehensible).

Results and Discussion

Descriptive statistics and bivariate correlations are shown in Table 1.

Table 1: Means, Standard deviations, and correlations of the measured constructs.

		M	SD	2.	3.
1.	SSE	4,03	0,79	.371**	.182**
2.	SPTP	4,09	0,65		.038
3.	PES	25,84	6,89		

Note **p < .001

Based on the theoretical range of the used scales (1-5) and value of the means we can conclude that students are on average moderately self-efficacious and they perceive teaching practices in TV lessons as high quality. As predicted, both parental educational status and perception of teaching practices were positively related to self-efficacy, and the intensity of the latter correlation is twice as high as the former.

In order to assess the relative power of selected predictors in explaining student self-efficacy, we conducted hierarchical multiple regression (blockwise), starting by adding PES as the first predictor, and in the next step, we added SPTP. The results of the analysis are presented in Table 2.

Table 2. Students' perceptions of teaching practices and parental educational status as the predictors of subject self-efficacy (N=1202).

Model	R2	ΔR2	β	p
Step I	.024			
PES			.155	.000**
Step II	.151	.127		
PES			.153	.000**
SPTP			.357	.000**

Note **p < .001

The hierarchical multiple regression revealed that at Stage one, PES contributed significantly to the regression model $F (1201, 1) = 29.51$, $p < .001$) and accounted for 2.4% of the variation in Student self-efficacy. Introducing the SPTP variable explained an additional 15.1% of variation in Student self-efficacy and this change in R² was significant $F (1200,2) = 107,10$, $p < .001$) The R-square change (increment) indicates that students' self-efficacy is about five times more affected by their perception of teaching practices than family educational level, although both predictors are significant.

Although the parent's support during the COVID-19 emergency remote learning is probably even more significant than in normal school conditions, our research has shown that the students' experience of how successfully they will cope with the requirements of a particular school subject depends to a much greater extent on how they evaluate the teacher's practices in TV classes. The results indicate that teachers can promote students' self-efficacy even in indirect and asynchronous televised instruction. It's encouraging that students on average perceive teaching practices in TV lessons relatively high in the context of public concerns that televised instruction will create a gap between students from disadvantaged and advantaged family background.

Acknowledgments

References

Džinović, V. i Vujačić, M. (2017). Samouverenja učenika o kompetentnosti u matematici i prirodnim naukama. U M. Marušić Jablanović, N. Gutvajn i I. Jakšić (Ur.), *TIMSS 2015 u Srbiji – rezultati međunarodnog istraživanja postignuća učenika 4. Razreda osnovne škole iz matematike i prirodnih nauka* (str. 115-128). Institut za pedagoška istraživanja.

Hattie, J. A. C. (2009). *Visible Learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.

Jakšić, I., Marušić Jablanović, M., Gutvajn, N. (2017). Činioci postignuća učenika iz Srbije u oblasti matematike. U: Marušić Jablanović, M., Gutvajn, N. i Jakšić, I. (ur.). *TIMSS 2015 u Srbiji, rezultati međunarodnog istraživanja postignuća učenika 4. razreda osnovne škole iz matematike i prirodnih nauka*, 67-94. Institut za pedagoška istraživanja.

Jovanović,V.(2014). *Faktori napredovanja na testu čitalačke pismenosti: predstave o znanju i karakteristike školskog konteksta* [Doktorska disertacija, Univerzitet u Beogradu, Filozofski fakultet]. https://nardus.mpn.gov.rs/handle/123456789/8098

Ladd, H. & L.Sorensen (2015). Returns to teacher experience: Student achievement and motivation in middle school, *CALDER Working Papers, No.112*, National Center for Analysis of Longitudinal Data in Education Research.

Luskin, B. J. (1983). Telecourses: 20 Myths, 21 Realities. *Community and Junior College Journal*, *53*(8), 48.

Muijs, D., & Reynolds, D. (2017). *Effective teaching: Evidence and practice*. Sage.

OECD (2018). *Effective Teacher Policies: Insights from PISA*. PISA, OECD Publishing. http://dx.doi.org/10.1787/9789264301603-en

Pavlović-Babić, D. B. (2007). *Evaluativna istraživanja obrazovnih postignuća: konceptualne i metodološke mogućnosti i ograničenja u interpretaciji rezultata: doktorska disertacija*. [Doktorska disertacija, Univerzitet u Beogradu, Filozofski fakultet].

Pelikan, E. R., Lüftenegger, M., Holzer, J., Korlat, S., Spiel, C., & Schober, B. (2021). Learning during COVID-19: the role of self-regulated learning, motivation, and procrastination for perceived competence. *Zeitschrift für Erziehungswissenschaft*, *24*(2), 393-418. https://doi.org/10.1007/s11618-021-01002-x

Schunk, D. H. (2012). *Learning theories an educational perspective sixth edition*. Pearson.

UNICEF (2020). Promising practices for equitable remote learning. Emerging lessons from COVID-19 education responses in 127 countries; приступљено 10.6.2020. ca https://ideas.repec.org/p/ucf/inores/inores1090.html

Opinions of Students, Professors, and Parents about Online Teaching in High Schools during the First Wave of the COVID-19 Pandemic

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Abstract

This research aimed to examine the opinions about the online teaching process in the Republic of Srpska during the initial stages of the COVID-19 pandemic, from the perspective of high school students, high school teachers, and parents of high school children. Groups responded to several close-ended and open-ended questions. Overall, there were significant differences between the groups, most notable in perceiving the number of obligations from teachers in online class, fear of "braking under pressure" from the workload, perceived difficulty in mastering the school material, as well as perceived relief due to not having to go to school. Specifically, students perceived online school workload as more challenging and the pressure as more intense than teachers and parents did. The most common suggestion for improving the online teaching process given by students, and echoed by teachers and parents, was to make online teaching more interactive and engaging. This research provides several useful insights that could be used to inform and build a more optimal approach to the online teaching process in possible new extraordinary circumstances in the future that would force the teaching process back to online modality again.

Keywords: COVID-19 pandemic; online classes; high school; Republic of Srpska; quantitative-qualitative mixed-method research

Introduction

Due to COVID-19 pandemic, starting from March 2020, online teaching was implemented in the Republic of Srpska's (RS) schools (SRNA, 2020). Without any prior regulation on this form of schooling, it was an uneasy transition. IT competences have been described as a crucial prerequisite for online learning. Findings from Bosnia (of which RS is a political entity) allude that the teachers typically have low levels of media and IT literacy (Vajzović et al, 2021). Another global obstacle for online teaching during early pandemic was a lacking technological infrastructure (Bao, 2020).

World-wide findings showed mixed to positive students' ratings of the online teaching experiences in the early COVID-19 stages, with most complaints being related to some mental health and wellbeing disturbances and higher academic stress, especially workload related (e.g., Lai et al., 2020; Lischer et al., 2021; Niemi & Kousa, 2020; Qazi et al., 2020; Rashid & Yadav, 2020; Zhang et al., 2020). Preliminary findings from the RS, however, indicated a below average satisfaction with online schooling, with students reporting an impaired concentration and overwhelming amount of schoolwork (Dragosavljević et al., 2020). There were also indications of family climate and history of childhood adverse family events being important predictors of academic struggles during the online schooling (Petković et al., 2020).

The aim of this study was to report and compare the opinions of RS high school students, high school teachers, and parents of high school children about the early COVID-19 online schooling process, centered on the students' experiences. Furthermore, we wanted to obtain the descriptions of the online teaching process itself and to gathered opinions on how it could be improved.

Method

Sample and Procedure

The data was gathered via anonymous online surveys from three RS convenience samples: high school students (N=540), high school teachers (N=48), and parents of high school children (N=54). Surveys were done in two phases: in mid-April 2020 for high school students, and in early-June 2020 for parents and teachers. The data gathering effort represents a partial continuation of work started by Dragosavljević et al. (2020) and Petković et al. (2020).

Instruments

Academic related fears and problems scale was adapted from Dragosavljević et al. (2020). We used a subset of 15 5-point Likert items mainly measuring perceived difficulties during COVID-19 online teaching. The scale was originally developed for students; thus, items for teachers and parents were modified to be answerable from their points of view – on how *they* believe *students'* experiences and issues were.

Open-ended questions were provided as an addition, asking for descriptions and opinions of the employed online schooling methods, and suggestions for future improvements.

Statistical Analyses

Quantitative data analysis was conducted on an item level, using t-tests (de Winter, 2013; de Winter & Dodou 2010) and Hedges' g as a measure of effect size. To surpass the need for p values correction due to multiple comparisons, we used Bayes factor – BF_{10} (Jarosz & Wiley, 2014). Higher BF_{10} indicates the higher probability of the hypothesized effect 'existing' in comparison to it 'not existing'.

Responses to the open-ended questions were categorized and coded by multiple independent raters.

Results

Quantitative Data

Since there is a total of 45 comparisons, we opted to report only the notable effects. Item labels are given in abbreviated forms.

Table 1 shows that students (M=4.35) perceived significantly more students' schoolwork in online schooling, compared to teachers (M=2.97). They also perceived more students' difficulties in mastering the material (M=3.84 vs. M=3.18), and were more inclined to suggest that students are "break under pressure" due to workload (M=3.36 vs. M=2.85). Students also anecdotally perceived online classes (M=3.03 vs. M=2.33) as a potential opportunity to rest from going to school (i.e., "recharge the batteries"). Teachers (M=2.91), more than students (M=2.02), recognized as an issue the lack of quite place for students to study.

Similar trends emerged between the students' and parents' answers, where students perceived higher workloads (M=4.35 vs. M=3.13), higher difficulty mastering the online school material (M=3.84 vs. M=3.18), and higher opportunity to "recharge" (M=3.03 vs. M=2.24), while parents perceived students "breaking under pressure" to a lesser extent (M=2.41 vs. M=3.36).

Table 1: Comparison of students' (1) and teachers' (2), and students' (1) and parents' (3) responses.

Items	(1) – (2)		(1) – (3)	
	g	BF_{10}	g	BF_{10}
Students have too much school work.	1.22	>100	1.08	>100
Students are "breaking under pressure".	0.39	2.83	0.72	>100
Difficulty mastering school material.	0.54	51.23	0.58	>100
"Charging batteries".	0.55	37.90	0.61	>100
No quiet place to study.	-0.69	>100	0.13	0.22

The only significant difference between teachers and parents was obtained regarding higher teachers' assessment of the lack of quite place for students to study (M=2.92 vs. M=1.85; g= 0.86, BF_{10}>100).

Qualitative Data

Most frequently reported platforms used for online teaching were Google Classroom (69%), Viber (27%), email (49%) and Zoom (29%).

Some students noted that COVID-19 online schooling process shouldn't be significantly changed (22%), while others suggested that it needs to be more interactive (17%), and that the workload needs to decrease (16%). Teachers mostly complained about the lack of technical support (28%). Both teachers (22%) and parents (10%) to an extent highlighted a necessity for the online teaching process to be more interactive.

Discussion

Results indicate that there were notable differences in the perception of early COVID-19 online schooling process between RS high school students, compared to high school teachers and parents of high school students.

Opinions of teachers and parents were mostly aligned, with one exception. Teachers perceived the availability of the designated quiet study place for the students to be a bigger issue than parents, and even students. Observing from a distance, it is possible that teachers were perhaps more 'objective', while both parents and students were too habituated to their family dynamic, even when it is not optimal (Petković et al., 2020).

RS students perceived an initial online school workload as significantly more challenging and the pressure as more intense than both teachers and parents, while also looking forward for a potential relief due to not having to go to school. Students in neighboring countries, with similar school curricula, also reported the workload being overwhelming (e.g., Vasojević et al., 2021). It is understandable that COVID-19 online schooling was implemented ad hoc. However, it is obvious that perceptions of an appropriate workload and difficulty levels between students and adults were misaligned.

The issues were amplified by the delivery methods – the most frequently used platforms (e.g., Google classroom, Viber) didn't offer sufficient capabilities for real-time audio-visual interaction between teachers and students. Students, teachers, and parents all noted that the online schooling process needed to be more interactive.

Emergencies like pandemic can illuminate deeper issues with the school & curriculum system and they should inform both current and future improvements (Sahlberg, 2021). New emergencies that could force the teaching process back to online modality are likely. Curricular workload and task structure should be proactively revised with that in mind, and ready and set should be the IT infrastructure capable of allowing students to actively interact with their peers and teachers, even if it is remotely.

Limitations

Most notable limitations of the study are: a time lapse between surveying students and teachers & parents, smaller size of the latter two samples, and the lack of direct within-group pairing of students, teachers, and parents.

References

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. *Human Behavior and Emerging Technologies, 2*(2), 113–115. https://doi.org/10.1002/hbe2.191

de Winter, J. C. (2013). Using the Student's t-test with extremely small sample sizes. *Practical Assessment, Research, and Evaluation, 18*(1), Article 10. https://doi.org/10.7275/e4r6-dj05

De Winter, J. F., & Dodou, D. (2010). Five-point likert items: t test versus Mann-Whitney-Wilcoxon (Addendum added October 2012). *Practical Assessment, Research, and Evaluation, 15*(1), Article 11. https://doi.org/10.7275/bj1p-ts64

Dragosavljević, S., Petković, T., Lugonja, L., & Subotić, S. (2020, November). *Mental health, coping and academic fears of high school students and students from BiH during COVID-19 pandemic.* Paper presented on a conference Banjalučki novembarski susreti, Banja Luka, Republika Srpska, Bosna i Hercegovina.

Jarosz, A. F., & Wiley, J. (2014). What are the odds? A practical guide to computing and reporting Bayes factors. *The Journal of Problem Solving, 7*(1), 2–9. https://doi.org/10.7771/1932-6246.1167

Lai, A. Y. K., Lee, L., Wang, M. P., Feng, Y., Lai, T. T. K., Ho, L. M., ... & Lam, T. H. (2020). Mental health impacts of the COVID-19 pandemic on international university students, related stressors, and coping strategies. *Frontiers in Psychiatry, 11,* Article 584240. https://doi.org/10.3389/fpsyt.2020.584240

Lischer, S., Safi, N., & Dickson, C. (2021). Remote learning and students' mental health during the Covid-19 pandemic: A mixed-method enquiry. *Prospects, 2021 Jan 5,* 1–11. https://doi.org/10.1007/s11125-020-09530-w

Niemi, H. M., & Kousa, P. (2020). A case study of students' and teachers' perceptions in a Finnish high school during the COVID pandemic. *International Journal of Technology in Education and Science (IJTES), 4*(4), 352–369. https://doi.org/10.46328/ijtes.v4i4.167

Petković, T., Gavrilović, A.-M., Keleman, A., Lugonja, L., & Subotić, S. (2020, November). *Adverse childhood experiences and family dynamic as predictors of academic issues of high school students and studnets from BiH during the pandemic of SARS-CoV-2 virus.* Paper presented on a conference Banjalučki novembarski susreti, Banja Luka, Republika Srpska, Bosna i Hercegovina.

Qazi, A., Naseer, K., Qazi, J., AlSalman, H., Naseem, U., Yang, S., ... & Gumaei, A. (2020). Conventional to online education during COVID-19 pandemic: Do develop and underdeveloped nations cope alike. *Children and Youth Services Review, 119,* Article 105582. https://doi.org/10.1016/j.childyouth.2020.105582

Rashid, S., & Yadav, S. S. (2020). Impact of Covid-19 pandemic on higher education and research. *Indian Journal of Human Development, 14*(2), 340–343. https://doi.org/10.1177/0973703020946700

Sahlberg, P. (2021). Does the pandemic help us make education more equitable? *Educational Research for Policy and Practice, 20*(1), 11–18. https://doi.org/10.1007/s10671-020-09284-4

SRNA. (2020, March 19). *Online schooling for high school studnets begins 23rd of March.* https://www.nezavisne.com/novosti/obrazovanje/Onlajn-nastava-za-srednjoskolce-u-RS-pocinje-23-marta/589623

Vajzović, E., Turčilo, L., Cerić, H., Osmić, A., & Silajdžić, L. (2019). Implementing media and IT literacy in schooling system – assessing teacher competences for teaching about media and IT in the canton of Sarajevo. *Sarajevski žurnal za društvena pitanja, 1–2,* 137–171.

Vasojević, N. A., Kirin, S., & Vučetić, I. (2021). How do high school students in Serbia accept distance learning? In V. Džinović & T. Nikitović (Eds.), *Collection of works from the XXVI scientific conference "Pedagoška istraživanja i školska praksa – Kvalitativna istraživanja kroz discipline i kontekste: osmišljavanje sličnosti i razlika"* (pp. 54–57). Institut za pedagoška istraživanja.

Zhang, Z., Zhai, A., Yang, M., Zhang, J., Zhou, H., Yang, C., & Zhou, C. (2020). Prevalence of depression and anxiety symptoms of high school students in Shandong Province during the COVID-19 epidemic. *Frontiers in Psychiatry, 11, 16–25.* https://doi.org/10.3389/fpsyt.2020.570096

Students' Experiences of the Effectiveness of the Teaching Process during the Shortened Live School Classes Following the Online Teaching Phase of the COVID-19 Pandemic

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Abstract

During the 1st wave of the COVID-19 pandemic schools across the world were closed and classes went online. Experiences from the subsequent pandemic stages are less understood, partially due to countries adopting different strategies of transitioning back from online classes. In the Republic of Srpska (RS) specifically, in the second semester of 2020/21, students returned to schools for face-to-face lessons with a shortened duration of 20-30 instead of the standard 45 minutes. It is unknown how students perceived the education process during this period. Thus, to better understand the students' experiences and fears, in February 2021 we conducted an online survey of 673 RS high school students (65.8% girls) of all four grades. We focused on the students' fears about being able to get good grades & their satisfaction with the knowledge received during the shortened classes, and their perceived chances of being competitive in job markets or universities with that knowledge. Results show that RS high school students were only mildly dissatisfied with the shortened classes that took place in the transitional period following the online teaching phase of the pandemic. No specific worry emerged to any notable extend, with the overall dissatisfaction rate of 39%.

Keywords: COVID-19 pandemic, shortened live school classes, high school, Republic of Srpska

Introduction

During the first wave of the COVID-19 pandemic schools worldwide were closed and classes were conducted online. Educational experiences from that period are, at this point, decently described in the literature. The lack of information and communication technologies, insufficient teachers' IT literacy, and the lack of time to adapt to the new teaching modality, have all been recognized as global problems related to the implementation of the early pandemic online teaching process (Ali, 2020; Bao, 2020; Qazi et al., 2020). A 'digital divide' was also evident (Bakker & Wagner, 2020, Lembang et al., 2020), as not all families had adequate access to digital technologies. These inequalities existed prior to COVID-19 and the pandemic has simply exposed them (Jæger & Blaabæk, 2020).

Professors and students faced a wide range of logistical, technical, financial, and social problems, while trying to move the educational activities in an online space (Lassoued et al., 2020; Peters et al., 2020). Professors had to deliver teaching content through a variety of 'new' and 'old' online technologies, including broadcasting, educational platforms, video conferencing and file sharing services, social networks, and so on (e.g., Aguilera-Hermida, 2020). These technologies were also used by students to submit their assignments and professors to monitor and judge the progress. Initially, this led to some professors assigning to many tasks, relying too much on the students' self-discipline, and the whole process being overly passive and non-interactive (Dragosavljević et al., 2020; Keleman & Subotić, 2021; Lischer et al., 2021; Niemi & Kousa, 2020; Radetić-Lovrić et al., 2022).

The pandemic and lockdowns have affected the mental health of some students, causing the increases in stress, anxiety, and depression (Cao et al., 2020; Islam, et al., 2020; Essadek & Rabeyron, 2020). Students were worried about the pandemic in general and about their future careers (Hasan & Bao, 2020). Lack of motivation and negative emotions (Aguilera-Hermida, 2020) made it difficult for many students to focus on online education.

In sum, there were many educational challenges during the first COVID-19 wave, students had a significant amount of stress and concerns related to increased workload, organization and communication difficulties, and feared for personal academic achievement (Lai et al., 2020; Lischer et al., 2021; Zhang et al., 2020). Still, the general sentiment of the student experiences can still be described as mildly positive (Qazi et al., 2020; Zhang, et al., 2020).

The same trend, however, was not necessarily true for every county. Specifically, students from the Republic of Srpska (RS) and B&H initially reported being very overwhelmed by the school workloads and unsatisfied on average. For example, preliminary findings by Dragosavljević et al. (2020) suggested 41% student satisfaction rates, with 51% pressure, worry, and poor concentration rates. Similarly, Radetić Lovrić et al. (2022) followed this up with reports of 40% satisfaction rates established on a very large, nationally representative RS sample. They also noted that students tended to be indifferent and somewhat confused about their educational future (46% rates).

Current Research

The early COVID-19 online schooling experiences and issues are well reported. However, educational experiences from the subsequent pandemic stages are less understood, partially due to countries adopting different strategies for transitioning back from online classes. In the RS specifically,

in the second semester of 2020/21, students have returned to schools for face-to-face lessons, but with a shortened duration of 20-30 instead of the standard 45 minutes. It is unknown how students perceived the education process during this period. Thus, this research was conducted to better understand some of the relevant students' experiences and fears from this transitional period. Informed by previously identified key points (e.g., Dragosavljević et al., 2020; Radetić-Lovrić et al., 2022) and our own rationale, we opted to focus the research on the students' expectations on being able to get good grades, their satisfaction with the knowledge received during the shortened classes, and their perceived chances of being competitive in job markets or universities with the knowledge obtained during the shortened classes transitional period of the COVID-19 schooling.

Method

Sample and Procedure

Data was gathered via an anonymous online survey in February 2021. We surveyed 673 RS high school students (65.8% girls) of all four grades.

Measures

As a part of a larger survey, questions used in this study included five Likert-type questions (5-point) measuring students' hopes of getting good grades and their satisfaction with the knowledge obtained during shortened classes, and the perceived utility of that knowledge on job & university markets (see Table 1 for abbrev. items).

Additionally, students were asked a single question directly comparing their opinion on shortened classes to pre-pandemic full-length classes (see Figure 1).

Results and Discussion

Since students' assessments were highly intercorrelated, they were reduced to a single latent factor dubbed 'Dissatisfaction with the knowledge received during shortened classes' (55.8% explained common variance) (Table 1). The average value of this dimension is 2.56 (SD=0.88), i.e., significantly below the theoretical mean of 3.00 (d=0.50, p<.001) – which would suggest a medium level of dissatisfaction. Thus, the observed level of students' dissatisfaction is moderately low, with an overall dissatisfaction rate of 39%.

Examining each of the items individually (Table 1), we can observe that students were the least worried about obtaining good grades during shortened classes (M=2.00, SD=1.19) and the most worried about receiving an insufficient knowledge to succeed at university (M=2.82, SD=1.24 – which is still below the theoretical mean of 3.00).

Table 1: Dissatisfaction with the knowledge received during shortened classes.

Items (abbrev.)	M	SD	Λ
Insufficient knowledge obtained during shortened classes to be able to do the job on the job market.	2.71	1.23	.75
Job lenders will prefer peers who went to school before the pandemic.	2.52	1.21	.48
Having doubts about the knowledge obtained during shortened classes.	2.75	1.28	.78
Fear of having a lower GPA due to shortened classes.	2.00	1.19	.53
Fears of having difficulties in college due to obtaining knowledge during shortened classes.	2.82	1.24	.80

Students' opinion of shortened classes compared to full-length classes before the pandemic was significantly below the midpoint 3.00 (M=2.42, SD=1.19; d=0.58, p<.001), i.e., below the cutoff for equal satisfaction with shortened and full-length classes (see Figure 1 for individual percentages). In other words, students viewed shortened classes as being slightly worse than classes of traditional length.
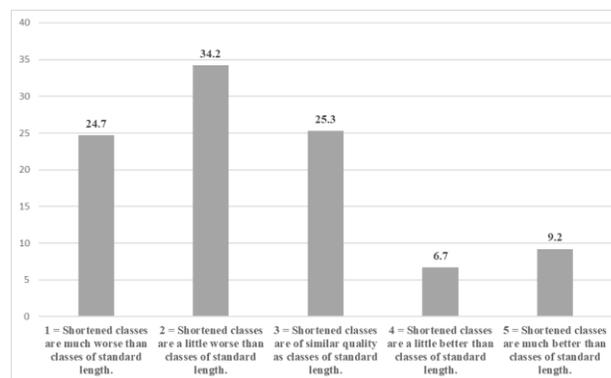
Figure 1: "What best describes your attitude towards teaching in a pandemic (%)?"

Conclusion

The results show that RS high school students were only mildly dissatisfied with the shortened classes that took place in the transitional period following the online teaching phase of the pandemic. They viewed shortened classes, roughly speaking, as only slightly worse than the pre-pandemic classes of traditional 45 minutes length. Note that these assessments were done retrospectively and with brief measures, thus being susceptible to the currency bias and arguably unable to detect subtle satisfaction differences.

No specific worry related to the shortened classes period was noticeably increased, with the overall dissatisfaction rate of 39%. Thus, is seems that, from the students' satisfaction point of view, shortened classes phase did not hold the same worries and frustrations observed during the early pandemic online classes period (Dragosavljević et al., 2020; Radetić-Lovrić et al., 2022).

References

Aguilera-Hermida, A. P. (2020). College students' use and acceptance of emergency online learning due to COVID-19. *International Journal of Educational Research Open, 1,* Article 100011. https://doi.org/10.1016/j.ijedro.2020.100011

Ali, W. (2020). Online and remote learning in higher education institutes: A necessity in light of Covid-19 pandemic. *Higher Education, 10*(3), 16–25. https://doi.org/10.5539/hes.v10n3p16

Bakker, A., & Wagner, D. (2020). Pandemic: lessons for today and tomorrow? *Educational Studies in Mathematics, 104*(1), 1–4. https://doi.org/10.1007/s10649-020-09946-3

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. *Human Behavior and Emerging Technologies, 2*(2), 113–115. https://doi.org/10.1002/hbe2.191

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research, 287,* Article 112934. https://doi.org/10.1016/j.psychres.2020.112934

Dragosavljević, S., Petković, T., Lugonja, L., & Subotić, S. (2020, November). *Mental health, coping and academic fears of high school students and students from BiH during COVID-19 pandemic.* Paper presented on a conference Banjalučki novembarski susreti, Banja Luka, Republika Srpska, Bosna i Hercegovina.

Essadek, A., & Rabeyron, T. (2020). Mental health of French students during the COVID-19 pandemic. *Journal of Affective Disorderrs, 277,* 392–393. https://doi.org/10.1016/j.jad.2020.08.042

Hasan, N., & Bao, Y. (2020). Impact of "e-Learning crack-up" perception on psychological distress among college students during COVID-19 pandemic: A mediating role of "fear of academic year loss". *Children and Youth Services Review, 118,* 1–9. https://doi.org/10.1016/j.childyouth.2020.105355

Islam, M. A., Barna, S. D., Raihan, H., Khan, M. N. A., & Hossain, M. T. (2020). Depression and anxiety among university students during the COVID-19 pandemic in Bangladesh: A web-based cross-sectional survey. *PloS One, 15*(8), Article e0238162. https://doi.org/10.1371/journal.pone.0238162

Jæger, M. M., & Blaabæk, E. H. (2020). Inequality in learning opportunities during COVID-19: Evidence from library takeout. *Research in Social Stratification and Mobility, 68,* Article 100524. https://doi.org/10.1016/j.rssm.2020.100524

Keleman, A., & Subotić, S. (2021, March–April). *Opinions of students, teachers, and parents about online teaching in high schools during the initial stages of the COVID-19 pandemic.* Paper presented at the XXVIII Empirical studies in psychology scientific conference, Belgrade, RS.

Lai, A. Y. K., Lee, L., Wang, M. P., Feng, Y., Lai, T. T. K., Ho, L. M.,Lam, V.S., Ip M.S., & Lam T.H. (2020). Mental health impacts of the COVID-19 pandemic on international university students, related stressors, and coping strategies. *Frontiers in Psychiatry, 11,* Article 584240. https://doi.org/10.3389/fpsyt.2020.584240

Lassoued, Z., Alhendawi, M., & Bashitialshaaer, R. (2020). An exploratory study of the obstacles for achieving quality in distance learning during the COVID-19 pandemic. *Education Sciences 10*(9), 1–13. https://doi.org/10.3390/educsci10090232

Lembani, R., Gunter, A., Breines, M., & Dalu, M. T. B. (2020). The same course, different access: The digital divide between urban and rural distance education students in South Africa. *Journal of Geography in Higher Education,* 44(1), 70–84. https://doi.org/10.1080/03098265.2019.1694876

Lischer, S., Safi, N., & Dickson, C. (2021). Remote learning and students' mental health during the Covid-19 pandemic: A mixed-method inquiry. *Prospects,* 1-11. https://doi.org/10.1007/s11125-020-09530-w

Niemi, H. M., & Kousa, P. (2020). A case study of students' and teachers' perceptions in a Finnish high school during the COVID pandemic. *International Journal of Technology in Education and Science 4*(4), 352–369. https://doi.org/10.46328/ijtes.v4i4.167

Peters, M. A., Wang, H., Ogunniran, M. O., Huang, Y., Green, B., Chunga, J. O., & Hayes, S. (2020). China's internationalized higher education during COCID-19: Collective student autoethnography. *Postdigital Science and Education, 2*(3), 968–988. https://doi.org/10.1007/s42438-020-00128-1

Qazi, A., Naseer, K., Qazi, J., AlSalman, H., Naseem, U., Yang, S., ... & Gumaei, A. (2020). Conventional to online education during COVID-19 pandemic: Do develop and underdeveloped nations cope alike. *Children and Youth Services Review, 119,* Article 105582. https://doi.org/10.1016/j.childyouth.2020.105582

Radetić-Lovrić, S., Runić, N., Cvijanović, N., Anđić, B., Đurić, D., Mojić, D., & Ružić Milunić, G. (2022). Vaspitanje i obrazovanje u doba COVID-19 pandemije. *Stavovi učenika, nastavnika, vaspitača i stručnih saradnika o vaspitno-obrazovnom radu tokom COVID-19 pandemije u školama i predškolskim ustanovama u Republici Srpskoj* [Research report]. Association of Psychologists of Republic of Srpska, Banja Luka. Retrieved from HERE.

Zhang, Z., Zhai, A., Yang, M., Zhang, J., Zhou, H., Yang, C., Duan, S. & Zhou, C. (2020). Prevalence of depression and anxiety symptoms of high school students in Shandong Province during the COVID-19 epidemic. *Frontiers in Psychiatry, 11,* 16-25. https://doi.org/10.3389/fpsyt.2020.570096

WORK PSYCHOLOGY

Relation between Job Demands, Job Resource and Work Engagement of Healthcare Workers during the COVID-19 Pandemic

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Abstract

Job resources mainly influence work engagement. However, high job demands may preclude the mobilization of job resources. In a similar vein, high job resources may reduce job demands. This study tried to investigate what determines the work engagement of healthcare workers during the COVID-19 pandemic to a more considerable degree - job demands or resources. The sample consisted of 257 healthcare workers. The data were collected from the March-end of May 2020. We used Work Engagement Scale and Job Demands and Resources Questionnaire. The hierarchical regression analyses were performed, with work engagement being the criterion variable. The first set of predictors included basic demographic variables, the second set included job demands, and the third set included job resources. The basic demographic variables explain 3.6% of the variance of the work engagement. When job demands were added, the proportion of the explained variance of work engagement increased to 13.9%. Finally, when job resources were added, the proportion of the explained variance of work engagement increased to 34.5% in the final model. Results imply that, during the COVID-19 pandemic, the impact of job demands on healthcare workers' work engagement is significant. However, job resources determine healthcare workers' work engagement more than job demands.

Keywords: job demands, job resource, work engagement, healthcare workers, COVID-19 pandemic

Introduction

Work engagement is "a positive, fulfilling, work-related state of mind characterized by vigour, dedication, and absorption" (Schaufeli et al., 2002, p. 74). Work engagement enhances employees' positive emotions, increasing productivity, proactive behaviours and job satisfaction (Bakker et al., 2011).

The Job Demands-Resources (JD-R) model (Demerouti et al., 2001), a widely recognized theoretical model for explaining the dynamic of work engagement, describes job demands as physical, cognitive, social, or emotional aspects that require an effort to overcome. They include, e.g., high workload, time pressure, and emotional demands. Job resources are physical, social, or organizational aspects that may reduce job demands, e.g., social support from colleagues, performance feedback, skill variety, autonomy, and learning opportunities (Demerouti et al., 2001).

Some studies have shown that high job demands may preclude the mobilization of job resources. In a similar vein, some studies have shown that high job resources may reduce job demands (Demerouti et al., 2001; Bakker et al., 2003).

Further, many studies have confirmed that job resources primarily influence work engagement, while job demands do not affect work engagement (Hakanen et al., 2008; Mauno et al., 2007; Bakker & Demerouti, 2008).

The COVID-19 pandemic brought different job demands, especially in the medical sector, directly involved in preventing and treating the disease. The studies have shown that during the COVID-19 pandemic, healthcare workers were exposed to higher job demands such as job overload, lack of job resources, concerns about being contaged and carry about the health and safety of family members and patients. Also, they were at risk of professional exhaustion, burnout and secondary traumatic stress (Babore et al. 2020; Chirico et al., 2021). All of mentioned job demands and circumstances may affect job performance and work engagement. Therefore, this study tried to investigate what determines the work engagement of healthcare workers during the COVID-19 pandemic to a more considerable degree - job demands or job resources.

Method

Participants and Procedure

The sample consisted of 255 healthcare workers (74.7% female) from three medical institutions (Primary Health Care, General Hospital and Institute for Physical Medicine and Rehabilitation) in Bosnia and Herzegovina, aged 20 to 64 (M=40.74, SD=11.73), with a length of service from 1 to 41 years (M=15.02, SD=11.5). Participants' level of education ranged from high school degree (36.5%), college degree (10.2%), university degree (44.7%) to a master or PhD degree (8.6%).

The data were collected during the March-end of May 2020. Data collection was performed through the paper/pencil method. Participation was on a voluntary and anonymous basis.

Instruments

The Utrecht Work Engagement Scale (Schaufeli, Bakker & Salanova, 2006). The scale consists of 9 seven-point Likert-type items that measure vigour, dedication and absorption. In this research, we used a total score which had acceptable internal consistency: α =.94.

Job Demands Resources Questionnaire (Bakker, 2014). The questionnaire consists of 32 five-point Likert-type items that measure: 1. Job demands: work overload (α=.88),

emotional demands (α=.85), cognitive demands (α=.79), role conflict (α=.84), and 2. Job resources: co-worker support (α=.83), supervisor support (α=.93), participation in decision-making (α=.88), opportunities for professional development (α=.91).

Results

Table 1 shows descriptive statistics and bivariate correlation for all variables in the study. Bivariate correlations between job resources and work engagement are positive and weak to moderate intensity. Regarding job demands, only work overload is a negative and weak correlated to work engagement, and role conflict is a negative and moderate correlated to work engagement (Cohen, 1988).

Hierarchical regression analysis (Table 2) was performed to test the predictive power of job demands and job resources in explaining work engagement. Results showed that demographic variables explained 3.6% of the variance of work engagement.

Table 1: Descriptive statistics and bivariate correlation between used variables

	1	2	3	4	5	6	7	8	9
1. WO	-								
2. ED	.37***	-							
3. CD	.35***	.55***	-						
4. RC	.38***	.29***	.15*	-					
5. CWO	-.01	-.06	.06	-.33***	-				
6. SS	-.08	-.12	.03	-.29***	.49***	-			
7. PDM	-.07	.10	.13*	-.16**	.47***	.43***	-		
8. OPD	-.13*	-.11	.04	-.22***	.39***	.49***	.34***	-	
9. WE	-.19**	.01	.03	-.28***	.20**	.27***	.35***	.47***	-
M	3.01	3.94	4.08	2.51	4.07	3.19	2.87	3.34	3.98
SD	1.03	1.13	.80	.95	.61	1.13	1.05	1.01	1.22
Sk	.36	-.02	-.73	.44	-.73	-.06	.20	-.36	-.74
Ku	-96	-.95	-30	-.17	-.20	-.97	-.87	-.30	.52

Note. WO- Work overload; ED- Emotional demands; CD- Cognitive demands RC- Role conflict; CWS- Co-worker support; SS - Supervisor Support; PDM- Participation in decision-making; OPD- Opportunities for professional development; WE– work engagement.
*p < .05; **p < .01; ***p < .001

Table 2: Results of hierarchical regression analysis

	Step 1 β	Step 2 β	Step 3 β
Gender	.047	.048	.095
Age	.180**	.167**	.147*
WO		-.131	-.121
ED		.097	.129
CD		.029	-.031
RC		-.278***	-.185**
CWS			-.066
SS			.002
PDM			.180*
OPD			.401***
R²	.036	.139	.345
F	4.471*	6.429***	12.348***
ΔR²		.104	.206
ΔF		7.181***	18.404***

Note. Binary variable gender is coded as 0=male, 1=female. WO- Work overload; ED- Emotional demands; CD- Cognitive demands RC- Role conflict; CWS- Co-worker support; SS- Supervisor Support; PDM- Participation in decision-making; OPD- Opportunities for professional development.
*p < .05; **p < .01; ***p < .001

Job demands explained an additional 10.4% of the variance of the work engagement, while job resources explained an additional 20.6% of the variance of the work engagement. So, the impact of job demands on healthcare workers' work engagement is significant. However, job resources determine healthcare workers' work engagement more than job demands. Regarding job demands, work engagement showed negative relation with role conflict. Concerning job resources, work engagement showed a positive relation with opportunities for professional development.

Discussion and Conclusion

Our results have shown a positive relationship between age and work engagement. Some prior studies (e.g., Coetzee & De Villiers, 2010; Hoole & Bonnema, 2015; Simpson, 2009) also have found that an employee's age and work experience could increase work engagement. This higher engagement may make more senior employees rejuvenated to learn new skills and be optimistic about their careers (Saks, 2006). It is possible that older healthcare workers may see the COVID-19 pandemic as an opportunity to learn something new in their profession, and therefore, they are more engaged.

Regarding job demands, only role conflict was negatively related to work engagement. Role conflict occurs when

workers are given different and incompatible roles simultaneously, or their role overlaps with another worker or workgroup. It is logical to assume that new circumstances, like a pandemic, expose healthcare workers to role conflict more than usual. In most previous research (i.e., Bakker et al., 2010; Demerouti & Bakker, 2011; Manas, 2018), role conflict was also a negatively contributing factor to work engagement. Additionally, a meta-analysis by Crawford e al. (2010) showed that hindrance demands, like role conflict, were negatively related to work engagement. These researchers argue that hindrance demands trigger negative emotions and a passive, emotion-focused coping style that leads to withdrawal from the situation, consequently reducing work engagement.

Concerning job resources, work engagement was positively correlated with opportunities for professional development. Previous studies in the health sector also recognized professional development and education as important factors that promote work engagement (Contreras et al., 2020; Keyko, 2016; Lourenção, 2018). Although the pandemic is a challenging situation for healthcare workers, it is simultaneously an opportunity for development and learning. So, having in mind this fact, the obtained result is not surprising.

Finally, it is important to say that our results imply that, during the COVID-19 pandemic, the impact of the job demands on healthcare workers' work engagement is significant. However, the obtained results also suggest that the job resources determine the work engagement of healthcare workers more than job demands, implying that more interventions on job resources are required to optimize healthcare workers' work engagement during the COVID-19 pandemic.

References

Babore, A., Lombardi, L., Viceconti, M. L., Pignataro, S., Marino, V., Crudele, M., Candelori, C., Bramanti, S.M., & Trumello, C. (2020). Psychological effects of the COVID-2019 pandemic: Perceived stress and coping strategies among healthcare professionals. *Psychiatry Research, 239,* 1-6. https://doi.org/10.1016/j.psychres.2020.113366

Bakker, A. B. (2014). The job demands–resources questionnaire. Rotterdam: Erasmus University.

Bakker, A., Albrecht, S., & Leiter, M. (2011). Key questions regarding work engagement. *European Journal of Work and Organizational Psychology, 20*(1), 4–28. https://doi.org/10.1080/1359432X.2010.485352

Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: State of the art. *Journal of Managerial Psychology, 22*(3), 309–328. https://doi.org/10.1108/02683940710733115

Bakker, A. B., Demerouti, E., Taris, T. W., Schaufeli, W. B., & Schreurs, P. J. G. (2003). A multigroup analysis of the job demands-resources model in four home care organizations. *International Journal of Stress Management, 10*(1), 16–38. https://doi.org/10.1037/1072-5245.10.1.16

Bakker, A. B., Hakanen, J. J., Demerouti, E., & Xanthopoulou, D. (2007). Job resources boost work engagement, particularly when job demands are high. Journal of Educational Psychology, 99(2), 274–284. https://doi.org/10.1037/0022-0663.99.2.274

Bakker, A. B., van Veldhoven, M., & Xanthopoulou, D. (2010). Beyond the demand-control model: Thriving on high job demands and resources. *Journal of Personnel Psychology, 9*(1), 3–16. https://doi.org/10.1027/1866-5888/a000006

Chirico, F., Ferrari, G., Nucera, G., Szarpak, L., Crescenzo, P., & Ilesanmi, O. (2021). Prevalence of anxiety, depression, burnout syndrome, and mental health disorders among healthcare workers during the COVID-19 pandemic: a rapid umbrella review of systematic reviews. J Journal of Health and Social Sciences 6(2), 209–2020. https://doi.org/10.19204/2021/prvl7

Coetzee, M. & De Villiers, M. (2010). Sources of job stress, work engagement and career orientations of employees in a South African financial institution. *South African Business Review, 14*(1), 27–58.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences, 2nd ed.* Hillsdale. New York: Erlbaum.

Contreras, F., Abid, G., Govers, M., & Saman Elahi, N. (2020). Influence of support on work engagement in nursing staff: the mediating role of possibilities for professional development. *Academia Revista Latinoamericana de Administración, 34*(1), 122–142. https://doi.org/10.1108/ARLA-04-2020-0057

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. Journal of Applied Psychology, 86(3), 499–512. https://doi.org/10.1037/0021-9010.86.3.499

Demerouti, E. & Bakker, A. B. (2011). The Job Demands–Resources model: Challenges for future research. *SA Journal of Industrial Psychology, 37*(2), 1-9.

Hakanen J., Schaufeli W. B., & Ahola K. (2008). The Job Demands–Resources model: A three–year cross–lagged study of burnout, depression, commitment, and work engagement. *Work and Stress, 22*(3), 224–241. https://doi.org/10.1080/02678370802379432

Hoole, C. & Bonnema, J. (2015). Work engagement and meaningful work across generational cohorts. *SA Journal of Human Resource Management 13*(1), 1-11. https://doi.org/10.4102/sajhrm.v13i1.681

Keyko, K., Cummings, G.G. , Yonge, O., Wong, C.A. (2016). Work engagement in professional nursing practice: A systematic review. *International Journal of Nursing Studies, 61,* 142-164, https://doi.org/10.1016/j.ijnurstu.2016.06.003

Lourenção, L.G. (2018). Work engagement among participants of residency and professional development programs in nursing. *Revista Brasileira de Enfermagem 71*(4), 1487-1492. https://doi.org/10.1590/0034-7167-2017-0278

Schaufeli, W., Salanova, M., Gonzalez-Roma, V. & Bakker, A. (2002) The Measurement of Engagement and Burnout: A Two Sample Confirmatory Factor Analytic Approach. *Journal of Happiness Stadies, 3,* 71-92. https://doi.org/10.1023/A:1015630930326

Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The Measurement of Work Engagement With a Short Questionnaire: A Cross-National Study. *Educational and Psychological Measurement, 66*(4), 701–716. https://doi.org/10.1177/0013164405282471

Simpson, M. R. (2009). Predictors of work engagement among medical-surgical registered nurses. *Western Journal of Nursing Research, 31*(1), 44–65. https://doi.org/10.1177/0193945908319993

Supportive Leadership and Affective Organizational Commitment: Moderating Role of Organizational Justice

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Abstract

Affective organizational commitment (AC) reflects emotional attachment, identification with the organization, and involvement in the organization. This study aimed to determine whether the relationship between supportive leadership and AC is moderated by organizational justice. The sample consisted of 319 employees (51.1% male). We used the Affective Commitment Scale, Supportive Leadership Scale and Organizational Justice Scale. Results of moderation analysis showed that, among employees with low and moderate level in perceived organizational justice, supportive leadership has no statistically significant effect on AC. However, among employees with a high experience of organizational justice, AC decreases as perceptions of supportive leadership decline. This study revealed that the relationship between supportive leadership and AC is not simple, and it partially depends on the perceived organizational justice. In particular, only employees with a high level of organizational justice experience significantly decrease AC as perceptions of supportive leadership decline.

Keywords: affective organizational commitment; supportive leadership; organizational justice; moderator

Introduction

Affective organizational commitment (AC) is regarded as the most important component of organizational commitment because it refers to an individual's emotional connection to the organization (Meyer & Allen, 1991). AC reflects an emotional attachment to, identification with, and involvement in the organization (Meyer & Allen, 1991). Employees with high AC put in more effort for the organization (Jalilvand & Vosta, 2015), have higher work performance (Meyer et al., 2002), lower absenteeism (Meyer, Allen & Smith, 1993), leave the organization less frequently (O'Reilly & Chatman, 1986), and demonstrate more organizational citizenship behavior (Organ, Podsakoff & MacKenzie, 2006). Therefore, understanding the determinants of AC is important for identifying intervention strategies to enhance employees' AC.

Supportive leadership is characterized by the leader's sensitivity to subordinates' individual and group needs, the expression of concern for the welfare of subordinates, and the creation of a friendly climate and a supportive work environment (Yukl, 2008). Previous studies (e.g., DeCotiis & Summers, 1987; Jermier & Berkes, 1979; Tjosvold & Tjosvold, 1991) identified supportive leadership as an important factor affecting AC. The mechanism linking supportive leadership with AC can be explained through social exchange theory (Blau, 1964); when one party does something valuable for another party, the receiving party will respond with something equally valuable. Supportive leaders motivate employees to respond by demonstrating an enhanced AC to the organization (Eisenberger et al., 2001).

In addition to exchanging relationships with their immediate supervisor, employees are also involved in exchange relationships with the larger organization (Masterson et al., 2000). Under that, there is an increasingly growing body of evidence (e.g., Barling & Phillips, 1993; Clay-Warner et al., 2005; Loi, Hang-Yue & Foley, 2006; Shepherd, Patzelt & Wolfe, 2011) that demonstrates that organizational justice positively correlated with AC. Since the organization sets rules, policies, and norms that provide fairness, employees may view the organization as responsible for its leaders' actions and role behaviours (Kim, Eisenberger & Baik, 2016). In this case, if employees' perception of supportive leaders is consistent with their perceived fair organization, the two mechanisms reinforce each other. In other words, when employees experience support from leaders, they can view it as an indication of the organization's fair orientation toward them (Rhoades, Eisenberger & Armeli, 2001). Hence, the moderation effect of perceived organizational justice can strengthen the relationship between supportive leadership and AC.

Accordingly, this study aimed to determine whether the relationship between supportive leadership and AC is moderated by perceived organizational justice. We predicted that organizational justice would moderate the relationship between supportive leadership and AC, such that the relationship is stronger when perceived organizational justice is high.

Method

Participants and Procedure

Participants were 319 employees (51.1% male) from Banja Luka, aged 19 to 69 (M = 33.76, SD = 10.64), with a length of service from 1 to 40 years (M = 10.15, SD = 9.44). Participants' level of education ranged from elementary school degree (3.4%), two- or three-year school degree for skilled or highly skilled workers (6.6%), high school degree (32.6%), college degree (6.3%) to a university degree (51.1%).

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

Instruments

Supportive Leadership Scale (Litwin & Stringer, 1968). This scale is part of the Leadership styles Scale and consists of 7 five-point Likert-type items. For this study, the scale had acceptable internal consistency α =.77.

Affective Commitment Scale (Meyer & Allen, 1991). This scale is part of the Organizational Commitment Scale and consists of 6 five-point Likert-type items. For this study, the scale had acceptable internal consistency α = .76.

Organizational Justice Scale (Colquitt, 2001). The scale consists of 20 five-point Likert-type items that measure procedural, distributive, interpersonal and informational justice. For this study, a total score had good internal consistency: α = .92.

Results

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

Table 1: Descriptive statistics and correlations.

Scale	M	SD	Sk	Ku	Correlations	
					SL	AC
SL	21.64	5.15	.04	.46		
AC	17.78	3.79	-.02	.18	.17**	
OJ	66.40	12.03	-.25	-.14	.64***	.35***

Note. SL - Supportive Leadership, AC - Affective Commitment, OJ - Organizational Justice
***p < .001, **p < .01

The bivariate correlation between supportive leadership and AC is positive and weak intensity. The correlation between AC and organizational justice is positive and moderate intensity, while the correlation between supportive leadership and AC is positive and strong intensity (Cohen, 1988).

When AC was used in the hierarchical regression analysis as a criterion and supportive leadership and organizational justice were used as predictors, the results show that supportive leadership explains 2.5% of the variance of AC ($F(1,317) = 9.154$, $p < .01$; $\beta = .168$, $p < .01$). Introduction of the organizational justice results in a significant increase in the amount of explained variance of AC ($\Delta R^2 = .096$, $F(2,316) = 22.445$, $p < .001$; $\beta = .403$, $p < .001$), but also in a decrease in the standardized regression coefficient of supportive leadership ($\beta = -.089$, $p > .05$). The introduction of the interactive effect of supportive leadership and organizational justice led to a significant increase in the amount of explained variance of the AC ($\Delta R^2 = .023$, $F(3,315) = 8.151$, $p < .01$; $\beta = -.157$, $p < .01$). The analysis was conducted with centered predictor variables. These results show that organizational justice is a significant moderator in the relationship between supportive leadership and AC. This moderation pattern was tested with Hays' (Hayes, 2013) "Process" SPSS macro and the results are shown in Figure 1.
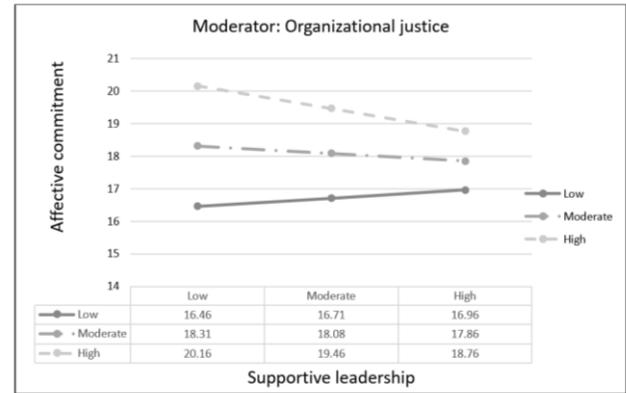

Figure 1: The moderating role of organizational justice in the relationship between supportive leadership and affective commitment.

Results showed that, among employees with low ($\theta_{(X \to Y)|M=54.00} = .048$, $t(319) = .757$, $p = .449$) and moderate ($\theta_{(X \to Y)|M=67.00} = -.044$, $t(319) = 1.630$, $p = .382$) level in perceived organizational justice, supportive leadership has no statistically significant effect on AC. But among employees with a high level in perceived organizational justice, AC decreases as perceptions of supportive leadership decline ($\theta_{(X \to Y)|M=78.44} = -.136$, $t(319) = -2.457$, $p = .015$).

Discussion and Conclusion

The acquired results support earlier studies (e.g., Barling & Phillips, 1993; Clay-Warner et al., 2005; DeCotiis & Summers, 1987; Jermier & Berkes, 1979; Loi et al., 2006; Shepherd et al., 2011; Tjosvold & Tjosvold, 1991), which found that supportive leadership and organizational justice are positive predictors of AC. These findings are consistent with social exchange theory (Blau, 1964).

Further, this study revealed that the relationship between supportive leadership and AC partly depends on the perceived organizational justice. In particular, only employees with a high level of organizational justice experience significantly decrease AC as perceptions of supportive leadership decline. This finding confirms that employees make distinctions between their leaders' behaviours and the organization on its own and are involved in exchange relationships with their immediate supervisor and the organization (Masterson et al., 2000). From this, we can conclude that the importance of organizational justice for AC is as important as supportive leadership. Even when supportive leadership is present, we cannot observe the development of AC when the perception of organizational justice is low or moderate. When combined with supportive leadership, a high perception of organizational justice will result in AC development.

According to the findings of this study, it can be concluded that an organization must assure the practice of organizational justice and encourage supportive leadership in order to achieve AC.

Employees with high AC put in more effort for the organization (Jalilvand & Vosta, 2015) because it reflects their attachment and loyalty to the organization (Mueller et al., 1992). Therefore, understanding the determinants of AC is important and beneficial for promoting AC in organizations.

References

Barling, J., & Phillips, M. (1993). Interactional, formal, and distributive justice in the workplace: An exploratory study. *The Journal of Psychology, 127,* 649–656. https://doi.org/10.1080/00223980.1993.9914904

Blau, P. (1964). *Exchange and power in social life.* New York: Wiley.

Clay-Warner, J., Hegtvedt, K. A., & Roman, P. (2005). Procedural justice, distributive justice: How experiences with downsizing condition their impact on organizational commitment. *Social Psychology Quarterly, 68,* 89–102. https://doi.org/10.1177/019027250506800107

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences.* New York: Erlbaum.

Colquitt, J. A. (2001). On the dimensionality of organizational justice: A construct validation of a measure. *Journal of Applied Psychology, 86*(3), 386-400. http://dx.doi.org/10.1037/0021-9010.86.3.386

DeCotiis, T. & Summers, T. (1987). A path analysis of a model of the antecedents and consequences of organizational commitment. *Human Relations, 40*(7), 445-470. https://doi.org/10.1177/001872678704000704

Eisenberger, R., Armeli, S., Rexwinkel, B., Lynch, P. D., & Rhoades, L. (2001). Reciprocation of perceived organizational support. *Journal of Applied Psychology, 86*(1), 42-51. https://doi.org/10.1037/0021-9010.86.1.42

Hayes, A. F. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach.* New York, NY: The Guilford Press.

Jalilvand, M. R., & Vosta, L. N. (2015). Examining the relationship between managerial power and affective organizational commitment: An empirical study in the sport sector of Iran. *Sport, Business and Management: An International Journal, 5*(4), 344–364.

Jermier, J. & Berkes, L. (1979). Leader behavior in a police command bureaucracy: A closer look at the quasi-military model. *Administrative Science Quarterly, 24,* 1-23. https://doi.org/10.2307/2989873

Kim, K. Y., Eisenberger, R., & Baik, K. (2016). Perceived organizational support and affective organizational commitment: Moderating influence of perceived organizational competence. *Journal of Organizational Behavior, 37,* 558–583. https://doi.org/10.1002/job.2081

Litwin, G. H. & Stringer, R. A. (1968). *Motivation and organizational climate.* Boston: Harvard University Press.

Loi, R., Hang-Yue, N., & Foley, S. (2006). Linking employees' justice perceptions to organizational commitment and intention to leave: The mediating role of perceived organizational support. *Journal of Occupational and Organizational Psychology, 79,* 101–120. http://dx.doi.org/10.1348/096317905X39657

Masterson, S. S., Lewis, K., Goldman, B. M., & Taylor, M. S. (2000). Integrating justice and social exchange: The differing effects of fair procedures and treatment on work relationships. *Academy of Management Journal, 43,* 738–748. https://doi.org/10.2307/1556364

Meyer, J. P. & Allen, N. J. (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review, 1*(1), 61-89. https://doi.org/10.1016/1053-4822(91)90011-Z

Meyer, J. P., Allen, N. J. & Smith, C. A. (1993). Commitment to organizations and occupations: Extension and test of a three-component conceptualization. *Journal of Applied Psychology, 78*(4), 538-551. https://doi.org/10.1037/0021-9010.78.4.538

Meyer, J. P., Stanley, D. J., Herscovitch, L. & Topolnytsky, L. (2002). Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences. *Journal of Vocational Behavior, 61*(1), 20-52. https://doi.org/10.1006/jvbe.2001.1842

O'Reilly, C. & Chatman, J. (1986). Organizational commitment and psychological attachment: The effects of compliance, identification, and internalization on prosocial behavior. *Journal of Applied Psychology, 71*(3), 492-499. https://doi.org/10.1037/0021-9010.71.3.492

Organ, D. W., Podsakoff, P. M. & MacKenzie, S. B. (2006). *Organizational citizenship behavior. Its nature, antecedents, and consequences.* Thousand Oaks: Sage Publications, Inc.

Rhoades, L., Eisenberger, R., & Armeli, S. (2001). Affective commitment of the organization: The contribution of perceived organizational support. *Journal of Applied Psychology, 86*(5), 825–836. https://doi.org/10.1037/0021-9010.86.5.825

Shepherd, D. A., Patzelt, H., & Wolfe, M. (2011). Moving forward from project failure: Negative emotions, affective commitment, and learning from the experience. *Academy of Management Journal, 54,* 1229–1259. https://doi.org/10.5465/amj.2010.0102

Tjosvold, D. W. & Tjosvold, M. M. (1991). *Leading the team organization.* New York: Lexington Books.

DEVELOPMENTAL PSYCHOLOGY

"*We Just Wanted to Go Out, Have A Drink, Meet Everyone, Hug...*" - Youth Narratives about Life During the Pandemic

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Abstract

The outbreak of the Covid-19 pandemic at the beginning of 2020 brought great changes in the daily lives of people of all ages. The initial empirical research conducted during the pandemic in many countries indicated an increased tendency of young people to develop psychological problems. This research aimed to shed additional light on young people's perspectives on the crisis and give them the opportunity to share their experiences of the pandemic. Through online form we collected 70 written narratives of adolescents and young people aged 14-26 (Mage = 20.1; SD = 2.9; 85.7% female). Collected narratives differed in length, coherence, valence, and content, which reflected young people's complex and diverse experiences during this pandemic crisis. In total, 755 segments were coded. Thematic analysis revealed eight major themes, with several subthemes within each. These major themes referred to 1) Sense of self, 2) Coping strategies, 3) Positive experiences, 4) Negative experiences, 5) Negative mental states, 6) Fears & anxieties, 7) Nostalgia & longing, and 8) Public attitudes. These findings can help us to "*hear their voice*" and gain a better understanding of adolescents' perspectives and experiences during the pandemic.

Keywords: adolescents and youth; narratives; crisis; qualitative study.

Introduction

The COVID-19 pandemic, , in addition to the great risk to people's health, led to unexpected disruptions in all domains of society's functioning. In accordance with WHO recommendation (WHO, 2020), Serbia declared state of emergency, with several measures introduced to hinder the spread of the corona virus and reduce human-to-human transmission. In a period of several months, state borders were closed, frequent curfews were imposed, and obligations to wear masks and maintain physical distance were introduced, requiring adaptations in the daily routines for which many people weren't prepared (Fioretti et al., 2020; Santos, 2020). All cultural and entertainment centres (theatres, cinemas, cafes), as well as shops and non-essential services were closed, along with restrictions on movement and socializing, limiting activities to a narrow family life. With the introduction of the state of emergency, educational institutions were also closed, while education was carried out remotely. Although the pandemic certainly had a negative impact on all age groups it did not have the same effect on people of different socioeconomic status, health status, place of residence and age (Agberotimi et al, 2010; Glovacz & Schmits, 2020).

Young people were at lower health risk, because they rarely developed more severe symptoms of the disease. But the pandemic and preventive measures that followed, affected young people in a specific way, interrupting developmental tasks typical of their age. The most important tasks relate to the definition of identity and the development of personal autonomy through the redefinition of family ties, the construction of diverse peer network, decision-making regarding the schooling, employment, independent future, finding a partner (Alonso-Stuick et al., 2018; Glovacz & Schmits, 2020; Krstic, 2017). The socialization plays a central role in the lives of young people, and due to the pandemic, they faced missing important life events, missing opportunities to develop new contacts and social skills (Branquinho et al., 2020). This transitional period, characterized by numerous key decisions, is psychologically challenging due to pronounced uncertainty (Arnett, 2007) making young people more vulnerable in the context of the pandemic (Balon et al., 2015). In fact, the initial empirical research conducted during the pandemic indicated an increased tendency of young people to develop psychological problems (Branquinho et al., 2020; Fioretti et al., 2020; Liang et al., 2020; Oosterhoff et al., 2020; Scott et al., 2020; Wang et al., 2020).

Having all that in mind, it is important to "*hear their voice*" (UNICEF, 2011), to get insights into youth's subjective experience of living during pandemic. Therefore, this research aimed to shed additional light on young people's perspectives on the crisis and give them the opportunity to share their experiences of the pandemic. More specifically, we wanted to explore how positive and negative memories during the pandemic were reflected in young people's narratives and which themes they used to make sense of their experiences.

Method

Sample and procedure

In order to gather adolescents' and youth's experiences during the pandemic, we constructed an online form with

the instruction to describe their perception of life during the pandemic, their positive and/or negative experiences and how those experiences affected them. From more than 1000 clicks on online form, we collected 119 written answers. We set the limit for min 800 characters, and all answers below that limit were excluded. We collected 70 written narratives from young people (85.7% female), aged 14-26 (M_{age} = 20.1; Sd = 2.9), in the period from January to March 2021, one year after the pandemic outbreak.

Data analysis

We conducted reflexive thematic analysis (Braun & Clarke, 2021) to identify the main topics present in youth's narratives. The MAXQDA Analytics Pro 2020 software was used for coding and analysis. We conducted the analysis with a bottom-up exploratory approach and inductively developed a coding system as a basis for generating themes. All three researchers first read and analysed 10 narratives and generated initial codes. Through a series of discussions, researchers reached a consensus on a final coding system and themes.

Results

Collected narratives differed in length, coherence, valence, and content, which reflected young people's complex and diverse experiences during this pandemic crisis. In total, 755 segments were coded. Thematic analysis revealed eight major themes, with several subthemes within each. These major themes referred to 1) Sense of self, 2) Coping strategies, 3) Positive experiences, 4) Negative experiences, 5) Negative mental states, 6) Fears & anxieties, 7) Nostalgia & longing, and 8) Public attitudes.

The most prevalent theme refer to strategies that young people used to cope with the crises and stress induced by pandemic. They wrote about different activities (everyday activities, physical exercise, volunteering) as a proactive way of dealing with the lockdown and pandemic. "*This is where we hear the "turning of a new page" in our four walls, new habits, healthy eating, exercise, painting, reading novels, watching movies, everything that was missing before the pandemic, digging for ourselves, searching for answers, something more mature, more meaningful, the search for peace, the real, inner one".* (Angela, 20)

Also, often they would mention focusing on positive perspective, their ability to adapt and accept what is inevitable, that all of that will past soon, and we will get back to normal. "*It will be very strange when everything goes back to normal. But I hope it'll happen as soon as possible".* (Jan 16)

Humour was one of the often-used coping strategies among emerging adults. In online contact with peers, humour helped them get through "one more day locked in the house". "*We somehow jokingly tried to overcome the stress of constantly publishing the numbers of new cases with assumptions, guessing - we competed to see who was closest to the "correct solution". It's kind of out of place, but it helped us, and I'll definitely always remember those moments".* (Mila, 24)

A number of narratives contained notes about different positive experiences during the pandemic. They referred to quality time with family, time to unwind and focus on oneself, time to dedicate themselves to their interests and hobbies, for which they normally don't have time: *"Nice things have happened to me. I met a boy…"*; *"I liked being alone for a bit and enjoying idleness and laziness"*; *"...I had fun with my family, and it wasn't that hard."*

That not everything during the pandemic and especially lockdowns were fun and easy for young people is indicated by many responses describing various negative mental states - many participants narrate about distress, feeling depressed, overwhelmed, loneliness, boredom, troubles with concentrations. *"I started shouting and crying, I was both angry and sad, bitter. I didn't want to be in isolation anymore, hello, my youth was passing by*." (Emili, 18). Young people wrote about negative experiences related to family, school/work, socializing, restrictions: *"…busy with online school that was too hard"; "...social life has been significantly impoverished...";* *"Lockdown is a horror!"*

Furter, a common theme in the narratives were their various worries and fears. Very impressive are their quotes about fear due to many unknowns related to virus, disease, pandemic: "*It was somehow the creepiest thing, you do something, you protect yourself, and you have no idea how effective it is, and yet you have no idea how scary, "funny" or whatever that virus actually is*." (Iva, 23)

They also described their worries about the uncertain and unknown future, *"I'm afraid of what the future holds for us"* for significant others, about fragility of the social system, etc.: "*but more important than the subjective feeling is that the whole world is collapsing, nothing works right*" (Mia, 17) *"...I am most concerned about how the world will return to normal because we are increasingly separating from each other"* (Angela, 20)

The fact that the pandemic has caused major disruptions in everyday life and imposed major restrictions on young people can be seen in the frequent mention that they "*longing for a normal life*": *"I think that all of us at this moment care more about freedom than health"; "I'm longing for hugs and companionship"; "We missed everything that used to be taken for granted…": "...I feel like my youth is passing by and I'm not enjoying it."*

Finally, youth narratives are showing how did this experience affected their self-concept. Young people saw pandemic crisis as an opportunity for personal growth, they matured, gain valuable insights about one self's and world around them and made clearer their priorities. Besides that, imposed social confinement helped them recognised significant people and "*importance of little things*": "*I realized the true value of things that I used to take for granted, such as hugs, socializing, going out... and how much they mean to me, for what I am*" (Eva, 22). On the other hand, in some cases those restrictions and social distancing led to deterioration of self-concept.

Discussion and Conclusion

This qualitative study aimed at exploring young people's experiences during the COVID-19 pandemic. Findings from this study can help us gain a better understanding of young people perspectives and narratives about their life during this crisis.

One significant theme in their stories of pandemic, refer to their distress and how they dealt with it. A number of young people from our sample showed resilience and use of adaptive coping strategies - devising activities and hobbies to fill the day, maintaining online contact with friends, using humour - these are some of the strategies that helped them cope with stress. However, the number of young people who used non-adaptive strategies - denial of danger, or on the contrary complete withdrawal due to overwhelming fear or intolerance of uncertainty - is not negligible either.

The largest number of codes in our analysis refer to negative experiences, states and feelings experienced by young people during this period. The results of this research are consistent with earlier findings that young people were more open about their negative experiences than positive ones, due to the need to give meaning and elaborate on the autobiographical past (Fioretti & Smorti, 2017; Fivush et al., 2003).

What young people missed the most was socializing and all the little things that make up their normal life - socializing, going out, sitting in a cafe. On the other hand, restrictions on social contacts and lockdowns pushed them back into the "arms of the family". Thanks to the opportunity for young people to spend quality time in shared activities with family members, family served as a protective factor in the situation of the pandemic crisis (Fioretti et al., 2020)

A significant theme in their narratives were positive memories and experiences, which affected their self-perception. They used the time of the pandemic to devote themselves to the things they love, and self-discovery plays a key role in the narratives of positive experiences. The positive changes they wrote about are related to some deeper insights about themselves, discovering their own resilience, abilities they didn't even know they had, and generally the ability to deal with this kind of crisis. Such positive changes experienced by people because of stress have already been described in the literature, as "stress-related growth" (Park et al., 1996), or "growth through adversity" (Joseph & Linley, 2006).

We should not ignore the finding that a number of participants wrote about unpleasant experiences and feelings, that they were overwhelmed with fear, anxious, distressed, unable to cope with uncertainty (Wigg et al., 2020). From the perspective of mental health, this finding indicates their vulnerability and how such major disruptions can shake them, make them even more insecure about themselves and the world they are living in. Although the greatest attention of all systems was focused on the preservation of people's physical health, and young people were the least health-risked, in such situations the issue of vulnerability and sensitivity of young people should deserve equal attention.

Taken all together, thematic analysis of young people's narratives indicate the complexity of their experiences during the pandemic crisis, which are characterized by mixed positive and negative feelings, the obstacles in achieving developmental tasks, but also opportunities for personal growth. Research findings also indicate the necessity of paying attention to the mental health of young people and their vulnerability in the context of crises such as the one we have just witnessed.

References

Agberotimi, S. F., Akinsola, O. S., Oguntayo, R., & Olaseni, A. O. (2020). Interactions between socioeconomic status and mental health outcomes in the Nigerian context amid COVID-19 pandemic: a comparative study. *Frontiers in Psychology, 11*, 559819. https://doi.org/10.3389/fpsyg.2020.559819

Alonso-Stuyck, P., Zacarés, J. J., & Ferreres, A. (2018). Emotional separation, autonomy in decision-making, and psychosocial adjustment in adolescence: A proposed typology. *Journal of Child and Family Studies, 27*(5), 1373-1383. https://doi.org/10.1007/s10826-017-0980-5

Arnett, J. J. (2007). Emerging adulthood: What is it, and what is it good for?. *Child development perspectives, 1*(2), 68-73. https://doi.org/10.1111/j.1750-8606.2007.00016.x

Balon, R., Beresin, E. V., Coverdale, J. H., Louie, A. K., & Roberts, L. W. (2015). College mental health: a vulnerable population in an environment with systemic deficiencies. *Academic Psychiatry, 39*(5), 495-497. https://doi.org/10.1007/s40596-015-0390-1

Branquinho, C., Kelly, C., Arevalo, L. C., Santos, A., & Gaspar de Matos, M. (2020). "Hey, we also have something to say": A qualitative study of Portuguese adolescents' and young people's experiences under COVID-19. *Journal of Community Psychology, 48*(8), 2740–2752. https://doi.org/10.1002/jcop.22453

Braun, V., & Clarke, V. (2021). Can I use TA? Should I use TA? Should I not use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches. *Counselling and Psychotherapy Research, 21*(1), 37-47. https://doi.org/10.1002/capr.12360

Fioretti, C., & Smorti, A. (2014). Improving doctor-patient communication through an autobiographical narrative theory. *Communication & Medicine 11*, 275–284. https://doi.org/10.1558/cam.v11i3.20369

Fioretti, C., Palladino, B. E., Nocentini, A., & Menesini, E. (2020). Positive and negative experiences of living in COVID-19 pandemic: Analysis of Italian adolescents' narratives. *Frontiers in Psychology, 11*, 599531. https://doi.org/10.3389/fpsyg.2020.599531

Fivush, R., Hazzard, A., McDermott Sales, J., Sarfati, D., & Brown, T. (2003). Creating coherence out of chaos? Children's narratives of emotionally positive and negative

events. *Applied Cognitive Psycholychology, 17*, 1–19. https://doi.org/10.1002/acp.854

Glowacz, F., & Schmits, E. (2020). Psychological distress during the COVID-19 lockdown: The young adults most at risk. *Psychiatry research, 293*, 113486. https://doi.org/10.1016/j.psychres.2020.113486

Liang, L., Ren, H., Cao, R., Hu, Y., Qin, Z., Li, C., & Mei, S. (2020). The Effect of COVID-19 on Youth Mental Health. *Psychiatr Q. 91*(3), 841-852. https://doi.org/10.1007/s11126-020-09744-3

Joseph, S., & Linley, P. A. (2006). Growth following adversity: theoretical perspectives and implications for clinical practice. *Clinical Psychology Review, 26*, 1041–1053. https://doi.org/10.1016/j.cpr.2005.12.006

Krstic, K. (2017) *Self-concept in adolescence: the role of parents and peers*. Institute of Psychology, University of Belgrade; Belgrade. COBISS.SR-ID 244409868

Oosterhoff, B., Palmer, C. A., Wilson, J., & Shook, N. (2020). Adolescents' motivations to engage in social distancing during the COVID-19 pandemic: associations with mental and social health. *Journal of Adolescent Health, 67*(2), 179-185. https://doi.org/10.1016/j.jadohealth.2020.05.004

Park, C. L., Cohen, L. H., and Murch, R. L. (1996). Assessment and prediction of stress-related growth. *Journal of Personality, 64*, 71–105. https://doi.org/10.1111/j.1467-6494.1996.tb00815.x

Santos C. F. (2020). Reflections about the impact of the SARS-COV-2/COVID-19 pandemic on mental health. *Revista brasileira de psiquiatria, 42*(3), 329-332. https://doi.org/10.1590/1516-4446-2020-0981

Scott, S. R., Rivera, K. M., Rushing, E., Manczak, E. M., Rozek, C. S., & Doom, J. R. (2021). "I Hate This": A qualitative analysis of adolescents' self-reported challenges during the COVID-19 pandemic. *Journal of Adolescent Health, 68*(2), 262–269. https://doi.org/10.1016/j.jadohealth.2020.11.010

UNICEF & Save the Children Fund. (2011). *Every Child's Right to be Heard: a resource guide on the un committee on the rights of the child general comment no.12.* https://resourcecentre.savethechildren.net/pdf/5259.pdf/ Save the Children, UK.

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., McIntyre, R. S., et al. (2020b). A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. *Brain, Behavior, and Immunity*, 40–48. https://doi.org/10.1016/j.bbi.2020.04.028

Wigg, C.M.D., Coutinho, I.M.F., da Silva, I.C., & Lopes, L.B. (2020). The mental health of children and adolescents during the COVID-19 pandemic: a narrative review. *Research, Society and Development, 9*,(9). http://dx.doi.org/10.33448/rsd-v9i9.7687

World Health Organization (2020*). Considerations for Quarantine of Individuals in the Context of Containment for Coronavirus Disease (COVID-19):* Interim Guidance. https://apps.who.int/iris/bitstream/handle/10665/331497/ WHO-2019-nCoV-IHR_Quarantine-2020.2-eng.pdf?sequence=1&isAllowed=y

The Experience of Coming out Process of the Lesbian, Gay and Bisexual Youth in Serbia

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Abstract

Contemporary studies have conceptualized the coming out process as a multidimensional, non-linear process that seeks to encompass all of the different and unique ways by which lesbian, gay or bisexual (LGB) people form and disclose their non-heterosexual identity, both to themselves and to others. Most of the previous research, using a quantitative approach, was aimed at inspecting aspects such as the number of people who have come out in a certain country, associations between psychosocial factors, mental health and the coming out process, or to develop a model that would explain the process of non-heterosexual identity formation. This qualitative study aimed to extensively explore the experience of coming out as a process. Participants who took part in this study were 10 LGB persons between the ages of 18 and 25. By using thematic analysis to analyze the data obtained from semi-structured, face-to-face interviews, four main themes emerged: (1) identity development and identity integration; (2) the strategies participants used in order to prepare themselves for the coming out conversations; (3) the feedback received from important people after the disclosure of their non-heterosexual orientation; (4) how has the coming out process been constructed and formulated within the social and cultural context.

Keywords: LGBT+, coming out process, sexual identity, qualitative research, thematic analysis

Introduction

Coming out process refers to the experience of becoming aware of ones non-heterosexual orientation and disclosing it to others (gradually or fully) (Ramussen, 2004). Coming out process is considered to be one of the most important aspects of life for many lesbian, gay or bisexual (LGB) people (Szulc & Dhoest, 2013). Disclosing ones sexual identity is an important aspect of sexual identity development because it demonstrates the willingness to make an important psychological decision (Heatherington & Lavner, 2008), and eminent degree of self-acceptance among LGB individuals (Chow & Cheng, 2010). The aim of the present study is to explore the position of LGB youth in Serbia, their experiences, motives, perspectives and feelings that were present during their coming out process, by using qualitative methodology. Therefore, the research question for this study: How is the coming out process experienced among LGB youth in Serbia?

Methodology

In order to produce the knowledge about the particular experience of the coming out process among LGB youth in Serbia, qualitative methodology has been used. In order to map common threads of meaning behind participants experiences of coming out, thematic analysis, as a method of data analysis has been adopted. Face-to-face interviewing process was used as a method of data collection. Each interview lasted between 30 and 55 minutes. The theoretical framework behind this research is Social phenomenology, meaning that the goal of the research was to understand the social reality that was subjectively experienced by LGB people in Serbia. Emphatic interpretation of the data has been adopted for the purpose of this research, in order to map the experiences of participants as they were describing it, without the elaborated interpretation of the meaning behind their story (Willig, 2013). Participants who took part in this research were lesbian, gay or bisexual (LGB) individuals between the ages of 18-25, who were recruited from Pride Info Center in Belgrade, Serbia. In all, 10 Serbian-speaking individuals took part in this research, out of which five were male and five female. Of those reported being bisexual, four were women and one was male. In all, four gay, one lesbian and five bisexual people took part in this research. Thematic analysis enabled the systematical mapping of meanings and experiences behind the coming out process that were common, or perceived as highly relevant, for the participants. In the process of analysis, a semantic approach has been adopted, meaning that no implicit meanings were looked for in the participants' words. No coding frame was used for data analysis, meaning that an inductive way of doing the thematic analysis has been selected (codes and themes were derived from the data itself).

Results

During the analysis of the data, 4 main themes were identified: a) identity development and integration; b) the strategies participants used in order to prepare themselves for the coming out conversations; c) the feedback received from important people after the disclosure of their sexual orientation out and d) how has the coming out process been constructed and formulated within the social and cultural context.

Identity development and integration

The first key theme that has been identified during the analysis of the data refers to the identity development and identity integration of the participants. The theme about identity has been divided into three main subthemes: developing self, (non) salience to identity and stereotypical appearance/demeanor. Coming out to oneself, becoming aware of ones sexual orientation has been a rather gradual, slow process which had a lot to do with questioning about

what one finds attractive and how should one label him/herself, however there has been a mapped difference to in terms to the degree to which ones sexual orientation has been perceived as significant and important to the participants overall self-identity perception. Participants elaborated to great extent on appearance, verbal and non verbal communication, gestures and body movements, and how those specific identity characteristic impacted their overall lives.

The strategies participants used in order to prepare themselves for the coming out conversations

This second theme refers to the process and the strategies participants used when they were disclosing their sexual orientation to other people. The three identifies subthemes are: building immunity, (in) direct coming out and selective coming out. This theme talks about how did the participants prepare for the coming out conversations, how did they decide to whom to come out, and how did they actually disclosed their sexual identity.

The feedback received from important people after the disclosure of their sexual orientation out

The second theme refers to the feedback participants received from other people, after the disclosure of their sexual identity. The experience of the reception of coming out varied greatly among participants. Most of them have experienced positive or neutral reactions, however those who had experienced negative reactions were exposed to a significant amount of distress.

How has the coming out process been constructed and formulated within the social and cultural context

The last theme refers to the impact coming out has had on participants lives and how has the coming out been constructed in the social system. The two subthemes that were recognized are congruence and social network. All 10 participants who took part in this research talked about the degree to which being out has had a positive impact on their overall lives. Coming out, disclosing ones sexual orientation to their family, friends, colleges and acquaintances has brought more freedom and liberation to participants in this research. Coming out is a social process, it is happening in a social context. Although coming out refers to both coming out to oneself and to others, it is primarily contextualized in terms of interpersonal relationships and social norms in a particular society.

Discussion

Although this research aimed to get insight into the specific, individual experiences of LGB people and not to propose some unique model or theory, it is worth mentioning that multi dimensionality and heterogenetic components of the coming out process have been noticed, as some contemporary research of the coming out process have had already proposed (Tomori et al., 2018). Giving the fact that the research about sexual minorities is still relatively young in Serbia, this research has brought some light into the unique experience of LGB people. The themes identified during the analysis of the data provide some insight into the psychological and social experiences that are associated with the coming out process of Serbian youth. However, the qualitative nature of this study implies that the findings may not be applicable to a wider sample. Furthermore, the fact that participants were recruited from Pride Info Center, one must bear in mind that those who visit such gay-focused settings might be further along in their identity development. Future studies could focus on exploring the experiences of specific groups among the LGB community, since the research from Eaton and Rios (2017) has show that the coming out process and sexual identity development differ among those who encompass different minority identities (e.g., ethnic and sexual orientation minority identity). Future research in this field could also be done in order to promote deeper understanding on how to construct preventative programs that will be oriented towards improving the psychological well being of LGB people. Preventative programs could also be directed towards family members of LGB people, as well as to their friends and acquaintances.

References

Chow, P., & Cheng, S. (2010). Shame, Internalized Heterosexism, Lesbian Identity, and Coming Out to Others: A Comparative Study of Lesbians in Mainland China and Hong Kong. *Journal of Counseling Psychology*, 57(1), 92-104.

Eaton, A. A., & Rios, D. (2017). Social challenges faced by queer Latino college men: Navigating negative responses to coming out in a double minority sample of emerging adults. *Cultural Diversity and Ethnic Minority Psychology,23*(4), 457-467.

Heatherington, L., & Lavner, J. (2008). Coming to Terms With Coming Out: Review and Recommendations for Family Systems–Focused Research. *Journal of Family Psychology*, 22(3), 329-343.

Rasmussen, M. (2004). The Problem of Coming Out. *Theory Into Practice*, 43(2), 144-150.

Szulc, L., & Dhoest, A. (2013). The internet and sexual identity formation: Comparing Internet use before and after coming out. *Communications: The European Journal of Communication*, 38(4), 347-365.

Tomori, Cecilia, Srikrishnan, Aylur, Ridgeway, Kathleen, Solomon, Sunil, Mehta, Shruti, Solomon, Suniti, & Celentano, David. (2018). Perspectives on Sexual Identity Formation, Identity Practices, and Identity Transitions Among Men Who Have Sex With Men in India. *Archives of Sexual Behavior*, 47(1), 235-244.

Willig, C. (2013). *Introducing qualitative research in psychology.* 3rd Edition. Berkshire, England: Open University Press.

Alone Together: Youth and Their Relationships during the COVID-19 Pandemic

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Abstract

This work focused on the effects of the COVID-19 crisis on youth's significant relationships. It was a part of a broader qualitative study of young people's narratives (administered online) about their experiences during the first year of the pandemic. The coding scheme was developed on the initial sample of 70 narratives, while 41 of those narratives containing codes about relationships (family, friends, romantic partners, community) were chosen for thematic analysis. Seven major themes were extracted: 1. Quality time with family; 2. Tensions between household members; 3. Missing close friends; 4. Missing social life; 5. Re-evaluating the role of others; 6. Benefits of romantic relations; 7. Connecting with the community. Participants noticed that their relationships with family members, peers, romantic partners and communities were different. Some of these changes were seen as positive (more time together, closeness, sense of belonging and shared experiences), while others were regarded as unfavorable or detrimental (physical and emotional distancing from peers, missing out). The pandemic significantly affected young peoples' quality of contact with others. The results imply that relational functioning should be assessed during a time of crisis, when it could be even more important than in regular circumstances, as a resource or an additional challenge.

Keywords: youth; COVID-19 pandemic; relationships; qualitative study; narratives

Theoretical Framework

Youth represents a group of teenagers and emerging adults (UN) who have specific relational needs. While teens focus on peers, emerging adults strive to stable parent and partner relations.

Youth's vital relationships have been affected by the COVID-19 crisis. Qualitative studies reflecting on the first period of the pandemic have shown that they experience either intensified quarrels or relationship improvements with family members, depending on the prior quality of these relations (Scott et al., 2021).

Significant transitional experiences usually realized through peer support (UNICEF, 2019) and social life (Stepanović et al., 2009) were deeply missed (Vuletić et al., 2021). Emerging adults' developmental task, creating a stable partner relationship (Arnett, 2013), was also challenged.

Beyond these 'personal' relational aspects, youth community involvement predicts positive psychological outcomes (McMahon et al., 2004), possibly also impaired during the pandemic.

Current Study

This research was a part of a broader qualitative study designed to 'give voice' to young people during the COVID-19 pandemic. The main idea was to understand the youth in a more personal manner, which required moving beyond quantitative methodology (Willig, 2013).

Aim

The study aimed to explore the quality of young people's significant relationships during the first year of the pandemic and the effects of relational changes on their day-to-day lives.

Method

Sample

The initial sample consisted of 70 narratives. We singled out 41, whose content included the topic of relationships. The participants from the final sample aged from 14 to 24 (M=19.85; 88% female).

Data Collection

The sample was collected conveniently via social media from March to May 2021. Participants filled out an online questionnaire that included demographic variables and an open question, encouraging them to write about positive and negative experiences during the past year and their effect on participants' self-image.

Data Analysis

Seven researchers developed a coding scheme for the initial narratives, using the MAXQDA software. Out of 818 coded segments (cs), 72 were related to relationships: family, friends, peers, and community. For the purposes of this study, thematic analysis was applied, and the relationship-related codes were inductively and iteratively regrouped into central themes.

Results and Discussion

The thematic analysis yielded seven major themes, presented in the Thematic Map, Figure 1.
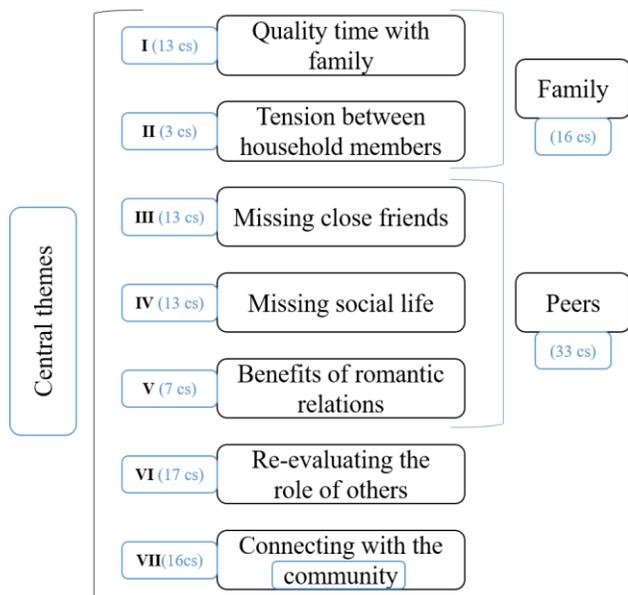
Figure 1: Central themes related to youth's significant relationships during the first year of the pandemic.

1. Quality time with family

Because of the confinement during the lockdown and fears of infection, family members spent most of their time together. Participants enjoyed the joint activities and saw the pandemic as an opportunity to focus on each other. From their point of view, this led to improvements in family relations.

As time went by, to be honest, I grew very close to my family, we were finally doing stuff together. (Sara, 18)

My favorite memories are more time with family and deepening these relations emotionally. (Tamara, 23)

2. Tension between household members

In some families, the significant time spent together led to conflicts. Participants felt frustrated for being with household members nonstop. They lacked physical and psychological space for their own needs.

While we were isolated and during quarantine there were much more fights, shouting and tension between us. (Relja, 15)

I also have to mention the expected nervousness between my household members. (Stevan, 23)

3. Missing close friends

Participants longed for face-to-face contact with close friends. They felt like these relationships were becoming more distant and missed the accustomed emotional support from peers. Closeness was seen as unsatisfactory when intimate friendships were reduced to online communication.

... it was like we stopped communicating with each other, we talked less and less, which was really hard for me

because at least that sort of communication and support meant a lot to me. (Milena, 17)

[…] we all became strangers, which had a major impact on me. (Tijana, 21)

4. Missing social life

Participants also longed for their old social life and gatherings in school, cafes, clubs, etc. They evaluated these activities as meaningful in terms of socializing and personal identity development. The feeling of missing out on relevant and irreplaceable experiences was also present.

I could not visit different events I love (concerts, festivals, parties, gatherings). (Ivana, 19)

It bothered me that I could not spend my fourth college year at the faculty with my group of friends at the lectures. (Tamara, 23)

5. Benefits of romantic relations

Those who mentioned their romantic relationships reported improved closeness due to more time spent together. Partners were seen as a source of support, stability, and stress alleviation. This was particularly true for those who started living together.

I became even closer with my boyfriend [...] *living together brought us even closer, made our bond stronger and taught us certain things.* (Sofija, 20)

At the end of the year I had the opportunity to [...] *live together* [with his girlfriend] *for a shorter time period, which was a great pleasure and relief after a stressful year.* (Dušan, 23)

6. Re-evaluating the role of others

For some, the pandemic was a time for reexamining their previous lives and gaining important insights regarding relationships. Participants were able to prioritize those friendships worth investing in.

If this had never happened, I wouldn't have known which individuals were actually my real friends and who were plain cowards who only see themselves and their own interest. (Ivana, 19)

At the same time, the COVID-19 crisis allowed them to understand that social isolation could also be beneficial.

Even though I missed dear people, isolation from everyone and everything suited me. (Lena, 18)

7. Connecting with the community

During this crisis, some participants found ways to cultivate a sense of belonging to a broader social group. Firstly, they empathized with vulnerable citizens and helped them by volunteering.

I joined a student counseling service and provided someone with psychological support for the first time. I was content about it. (Marko, 23)

Secondly, some developed a sense of social responsibility by keeping in mind the needs of those in a less privileged position.

I was annoyed at the fact that so many people were emptying store shelves and thinking only about themselves. No one cared about the poor who [...] purchase day to day so that they can survive. (Ivana, 19)

Lastly, participants recognized the pandemic as a shared experience, which allowed them to feel connected to humankind as a whole.

There was also this strange, but wonderful feeling of togetherness, because never had I felt until now that literally the whole humankind is dealing with the same problem. (Katarina, 22)

Conclusion

In conclusion, the pandemic, especially physical distancing, affected young peoples' quality of contact with significant others, their relational values, and expectations. They mostly appreciated alone and family time, as well as exchange via social media, while simultaneously dealing with hardships of reduced live contact with peers. The results are in accordance with previous studies, pointing to an additional need for adaptation in the family system, and expected fear of becoming estranged from peers.

Closeness in romantic relationships was one of the valuable coping resources. The same could be said for pro-social behavior and social awareness, as means for making sense of the pandemic. These aspects should be considered more profoundly in further research.

Whether they represent a challenge or a valuable resource for adapting to the pandemic, relationships should always be taken into account as important factors while assessing young people's functioning in times of crisis.

Acknowledgments

References

Alvis, L. M., Douglas, R. D., Shook, N. J., & Oosterhoff, B. (2022). Associations between adolescents' prosocial experiences and mental health during the COVID-19 pandemic. *Current Psychology*, 1936-4733.

Arnett, J. J. (2013). *Adolescence and emerging adulthood: Pearson new international edition*. Pearson Higher Ed.

McMahon, S. D., Singh, J. A., Garner, L. S., & Benhorin, S. (2004). Taking advantage of opportunities: Community involvement, well-being, and urban youth. *Journal of Adolescent Health, 34*(4), 262-265.

Scott, S. R., Rivera, K. M., Rushing, E., Manczak, E. M., Rozek, C. S., Doom, J. R. (2021). "I hate this": A qualitative analysis of adolescents' self-reported challenges during the COVID-19 pandemic. *The Journal of Adolescent Health, 68*(2), 262-269.

Stepanović, I., Videnović, M., & Plut, D. (2009). Youth Spare Time: Typical Patterns of Behavior. *Sociologija, 51*(3), 247-261.

UNICEF (2019). *Situation Analysis of Children and Adolescents in Serbia*. UNICEF, Serbia.

Vuletić, T., Ignjatović, N., Stanković, B., & Ivanov, A. (2021). "Normalizing" Everyday Life in the State of Emergency: Experiences, Well-Being and Coping Strategies of Emerging Adults in Serbia during the First Wave of the COVID-19 Pandemic. *Emerging Adulthood, 9*(5), 1-19.

Willig, C. (2013). *Introducing Qualitative Research in Psychology* (Trans. R. Krstanović). Clio.

How Do Adolescents Perceive Their Intelligence? Correlates of Self-Estimated Intelligence in Personality and Intelligence Domains

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Abstract

The image that adults have of their intelligence has long been the focus of researchers. On the other hand, findings on self-estimated intelligence in adolescence and its correlates are limited. This research aimed to examine how adolescents evaluate their intellectual abilities and determine the relationship of this construct with psychometric intelligence, basic personality traits, grandiose narcissism and self-esteem. The results of a convenient sample of 239 Belgrade high school students showed that the nature of the relationship between self-estimated intelligence and the previously mentioned constructs in adolescents differs compared to the adult population. Positive relationships with conscientiousness, grandiose narcissism and psychometric intelligence are noted. However, those with openness, extraversion and emotionality are absent. Additionally, we examined the role of self-estimated intelligence as the mediator between narcissism and self-esteem. Taken together, these results point to a specific, school context-mediated, relationship that adolescents have toward their intellectual abilities.

Keywords: self-estimated intelligence; conscientiousness; grandiose narcissism; adolescents

Introduction

Self-awareness about one's intellectual abilities, in literature know as self-estimated intelligence (SEI) (Chamorro-Premuzic & Furnham, 2004) has shown to be a significant predictor of several life outcomes such as school and career success, physical health and well-being (Howard & Cogswell, 2018). These findings raised interest in understanding the factors that contribute to the way adults assess their intellectual abilities.

Previous studies consistently show that SEI has low, positive correlations with psychometric intelligence (Freund & Kasten, 2012; Gold & Kuhn, 2018). In comparison to intelligence, SEI has stronger relationships with extraversion, emotionality and openness (Chamorro-Premuzic et al., 2010; Jacobs et al., 2012). Moreover, research has shown strong correlations between SEI and grandiose narcissism (Zajekowski et al., 2019) - a high estimation of one's intelligence assists in prevailing an overly positive, grandiose picture of oneself. This is further supported by findings that SEI is a mediator between grandiose narcissism and well-being.

All previously mentioned findings were obtained from the population of adults, while knowledge on how adolescents perceive their intelligence remains limited. There is some evidence (Chen et al., 1988) that adolescents conceptualize intelligence in an idiosyncratic way, which could also shape the evaluations of their intellectual abilities. The empirical literature testing this is not extensive, but shows a low negative relationship between SEI and emotionality and a low positive relationship with intelligence (Chamorro-Premuzic et al., 2010; Gold & Kuhn, 2018). This study aimed to further investigate these findings.

Method

Sample and procedure

The sample consisted of 239 Belgrade highschool students (60.3% female), aged 15 - 19 (M = 16.93, SD = 1.08). All data were collected online, via the Total Assessment platform. Link to the battery was distributed to highschool directors, alongside the ethical approval. If they consented teachers would distribute the link to students via Google Classroom platforms.

Instruments

Questionnaire of Narcissistic Admiration and Rivalry - NARC (Back et al., 2013) - two-faceted operationalization of grandiose narcissism. Both subdimensions, admiration and rivalry, are operationalized through 9 Likert-type items (1- I do not agree at all, 5-I totally agree). There are no negatively coded items. The reliability of the global score is α=.84 (Lazarević et al., 2021).

Rosenberg Global Self-Esteem Scale (Rosenberg, 1965) – operationalizes psychological well-being and self-esteem through 10 self-assessment items, of which four are negatively coded. The answer to the items is given on a four-point Likert-type scale (1-do not agree at all; 4-completely agree). The reliability of the scale is .79 (Rosenberg, 1965).

HEXACO-60 (Ashoton & Lee, 2009) – a 60-item personality assessment test, with 29 negatively coded items. Each personality trait (honesty, emotionality, extraversion, cooperation, conscientiousness and openness) is represented by a total of 10 items, and each of the four facets within the trait is operationalized with two or three items. Participants express their agreement with the items on a five-point Likert scale (1-strongly disagree, 5-strongly agree). The reliability interval is α=.65-.80 for the Serbian version of the instrument (Međedović et al., 2019).

Raven's progressive matrices (Živanović, 2019) – a one-dimensional g-factor measure of fluid intelligence. The task consists of 16 matrices, dimensions 3x3, with one element missing. The participant's task is to recognize which of the six offered answers fits best in each of the matrices. The time

to complete the entire task was limited to 5 minutes. Reliability of the task is α=.65 (Živanović, 2019).

Self-estimated intelligence scale - by existing operationalizations (Jacobs et al., 2012) participants were asked to position their intellectual abilities by evaluating their intelligence on a continuum from 85 to 130 IQ units.

Results

Most inventories showed acceptable reliability, which can be seen in Table 1, along with an overview of the descriptive statistics.

Table 1: Descriptive statistics

	M	Sd	Sk_z	Ku_z	α
SEI	110.87	10.33	0.05	-1.78	/
IQ	7.88	2.37	-0.54	-1.62	.66
NARC	42.33	10.14	2.91**	2.96**	.80
SE	21.07	3.84	3.92**	3.00**	.42
H	33.41	7.11	-1.17	1.05	.66
E	30.64	5.97	-1.82	-1.25	.53
X	31.0	8.07	-2.25*	0.980	.80
A	30.15	5.57	-0.01	0.22	.47
C	34.61	7.58	-0.05	-2.25*	.80
O	35.35	7.60	-2.19*	-1.18	.74

Note: M-mean, Sd-standard deviation, Sk_z-standardized skewnees, Ku_z-standardized kurtosis, α-Cronbach's alpha, *p < .05, **p < .01

Correlations between SEI, IQ and other predictors are shown in Table 2. There are significant correlations between SEI and psychometric intelligence, narcissism and conscientiousness. No other personality traits correlated with measure of self-esstimated intelligence.

Table 2: Correlations between SEI, IQ and personality

	SEI
IQ	.129*
H	-.088
E	-.039
X	.075
A	-.127
C	.155**
O	.091
NARC	.259**

We conducted a path analysis to test the mediating role of SEI between narcissism and self-confidence. Although there is a direct effect of grandiose narcissism on self-esteem (β =.268, 95 CI: .121/.411, p<.01), the indirect effect is only marginally significant(β = .078, 95 CI: .044/.127, p=.068).

Discussion

The goal of this research was to examine the relationships SEI has with constructs of personality traits, narcissism and psychometric intelligence in adolescent population.

A low, positive relationship between psychometric and self-estimated intelligence was observed. This finding is in line with previous studies (Freund & Kasten, 2012; Howard & Cogswell, 2018), although the intensity of the correlation is lower. Since our research was conducted on younger respondents, we can cautiously assume that results support the idea that high school students conceptualize intelligence differently than adults. More precisely, they evaluated their intellectual abilities according to criteria that differ from those that determine achievement on the Raven's progressive matrices.

The variable that explains the most variance in self-estimated intelligence is grandiose narcissism. This pattern of results is in line with findings on the adult population (Zajenkowski et al., 2019).

The relationship between SEI and basic personality traits differs significantly from the results obtained on adults. The relationships with emotionality, extraversion and openness (Howard & Cogswell, 2018) were not found. Instead there is a low positive correlation with the conscientiousness trait. If we assume that high school pupils still predominantly perceive intelligence through the prism of school success, these results are not surprising. For this reason, students who are more conscientious and diligent tend to estimate their intellectual abilities as higher.

What is more surprising is the lack of correlation with openness - a trait that serves as a reference point against which intellectual abilities are assessed (Gignac et al., 2004). The absence of this connection could further point to the conclusion that there are significant differences in the way adolescents conceptualize and evaluate intelligence.

Taken together, our findings converge towards the conclusion that, in adolescence, SEI is dominantly influenced by the school context, which explains the importance of the trait of conscientiousness, while other personality variables contribute insufficiently to the explanation of self-estimated intelligence. Since the total percentage of SEI's variance explained by personality variables in our study is comparable to those on adult samples (Howard & Cogswell, 2018), we assume that maturing leads to a kind of decentering from school achievement. This could create space for the manifestation of the influence of other traits later in life. It is important to emphasize that such explanations are speculative and that it would be necessary to verify them in more extensive cross-sectional studies.

References

Ashton, M. C., & Lee, K. (2009). The HEXACO–60: A short measure of the major dimensions of personality. Journal of personality assessment, 91(4), 340-345.

Back, M. D., Küfner, A. C., Dufner, M., Gerlach, T. M., Rauthmann, J. F., & Denissen, J. J. (2013). Narcissistic

admiration and rivalry: disentangling the bright and dark sides of narcissism. *Journal of personality and social psychology, 105*(6), 1013.

Chamorro-Premuzic, T, & Furnham, A. (2004). Personality and intelligence as predictors of statistics examination grades. *Personality and Individual Differences, 37*(5), 943–955. https://doi.org/10.1016/j.paid.2003.10.016

Chamorro-Premuzic, T., Harlaar, N., Greven, C. U., & Plomin, R. (2010). More than just IQ: A longitudinal examination of self-perceived abilities as predictors of academic performance in a large sample of UK twins. *Intelligence, 38*(4), 385–392. https://doi.org/10.1016/j.intell.2010.05.002

Chen, M. J., Holman, J., Francis-Jones, N., & Burmester, L. (1988). Concepts of intelligence of primary school, high school and college students. *British Journal of Developmental Psychology, 6*(1), 71–82. https://doi.org/10.1111/j.2044-835X.1988.tb01081.x

Freund, P. A., & Kasten, N. (2012). How smart do you think you are? A meta-analysis on the validity of self-estimates of cognitive ability. *Psychological Bulletin, 138*(2), 296–321. https://doi.org/10.1037/a0026556

Gignac, G. E., Stough, C., & Loukomitis, S. (2004). Openness, intelligence, and self-report intelligence. *Intelligence, 32*(2), 133–143. https://doi.org/10.1016/j.intell.2003.10.005

Howard, M. C., & Cogswell, J. E. (2018). The "other" relationships of self-assessed intelligence: A meta-analysis. *Journal of Research in Personality, 77*, 31–46. https://doi.org/10.1016/j.jrp.2018.09.006

Jacobs, K. E., Szer, D., & Roodenburg, J. (2012). The moderating effect of personality on the accuracy of self-estimates of intelligence. *Personality and Individual Differences, 52*(6), 744–749. https://doi.org/10.1016/j.paid.2011.12.040

Lazarević, L. B., Knežević, G., & Bosnjak, M. (2021). Does the disposition towards psychotic-like experiences incrementally predict grandiose narcissism? Representative evidence from Germany. *Current Psychology,* 1-12.

Međedović, J., Čolović, P., Dinić, B. M., & Smederevac, S. (2019). The HEXACO personality inventory: Validation and psychometric properties in the Serbian language. *Journal of personality assessment, 101*(1), 25-31.

Zajenkowski, M., Czarna, A., Szymaniak, K., & Dufner, M. (2019). What do highly narcissistic people think and feel about (their) intelligence?. *Journal Of Personality, 88*(4), 703-718. https://doi.org/10.1111/jopy.12520

Živanović, M. (2019). Efekti transkranijalne neuromodulacije fronto-parijentalne funkcionalne mreže na više kognitivne funkcije. [Doctoral dissertation, University of Belgrade].

Early Childhood Development Stimulation: One Way of Measuring

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Abstract

Supportive, warm, and psychologically stimulative interactions between caregivers and children are very important factors of the child's development and represent an indicator of care quality. However, there are no direct or self-reported instruments for estimating the quality of early childhood stimulation in Serbia. This research aims to (1) determine psychometric and descriptive properties of the constructed instrument, and (2) investigate the correlation between the frequency of these activities, socioeconomic status, and the developmental status of the child. Based on the Early Learning and Developmental Standards for children in Serbia, the Inventory of Stimulative Activities for Child Development (ISCAD) was constructed. The obtained results indicate good psychometric characteristics of the new instrument. A significant correlation with the developmental status of the child is observed. No significant correlations were found with the mother's education or economic status.

Keywords: early childhood development, care quality, simulative activities, ISCAD questionnaire

Introduction

Early childhood development (from birth to 6 years) is widely recognized as a critical period due to the intensive development and high plasticity of the brain (Shonkoff, 2003). Reaching this period milestones provides the foundation for later development and success in academic and professional life (Shonkoff et al., 2009). Research has shown that the development in this period is highly dependent on the interaction with the caretakers. That interaction follows "the serve and return pattern" (National Scientific Council for Developing Child, 2004) – the child sends signals (crying, smiling, bubling, moving…) and the caretaker answers and stimulates further communication. If this pattern occurs regularly, the new neural connections are developed while the olds are stimulated (Shonkoff, 2003). Additionally, the lack or inconsistence of proper interaction during early age may lead to the loss of the neural connections vital for normal functioning (Shonkoff, 2003). There are several current attempts to define all aspects of care quality that parents need to provide for child's optimal and thrive development. One of those attempts is Nurturing Care Framework for Early Childhood Development (WHO, 2018). In this framework responsive care and frequency of learning activities are positioned as a starting point and prerequisite for health, security and nutrition. However, this way defined the care quality is challenging to measure. Researchers and practitioners mostly use observational measures, which can be expensive, time consuming and difficult to use and score. Self-report measures are far less available, to our knowledge.

The aim of this research is to construct an instrument to assess the frequency of the stimulative activities in child's environment and to determine its psychometric properties. The correlation between the frequency of the simulative activities in the child's environment and the developmental status of the child was investigated.

Besides that, this study aims to investigate the correlation between the frequency of these activities and socioeconomic status. Research shows that concerning percent of children who live in low- and middle-income countries don't have optimal supportive environment and don't achieve their full developmental potential (Black et al., 2017; Grantham-McGregor et al., 2007). Studies also suggested that parent's lower income and lower educational level can contribute to lower quality of interaction with the child (Gilkerson et al., 2017; Weisleder & Fernald, 2013).

Method

Sample

The sample consisted of 1388 parents (90% mothers) of children aged from 1 to 60 months (53% boys and 47% girls). Parents were examined in 22 Serbian districts, out of a total 24. The number of parents per district was determined to be proportional to the total number of young children. The education level of the sample was relatively high - 41% of parents had secondary education, 39% had higher education. Assessments of economic status in relation to other people living in Serbia were also relatively high - on a scale from 1 to 10, the average score was 6.28.

Instruments

Inventory of Stimulative Activities for Child Development (ISCAD). An expert group of developmental psychologists formulated activities that would be supportive for child development based on the Early Learning and Developmental Standards for children in Serbia. After the pilot study, the Inventory of stimulative activities for child development (ISCAD) was designed for 8 age intervals (from 1 to 60 months). The parents indicated how frequently (on the five-point scale from never to almost every day) in the past 15 days they were involved in the listed activities with the child. The number of items on each age interval ranged from 13 to 29. In order to create comparable scores across the age intervals, the total score on each scale was calculated by dividing the sum score by the number of items.

Ages and stages questionnaire® (ASQ-3) is a parent-completed screening questionnaire measuring the developmental status of a child in 5 domains: communication, gross motor, fine motor, solving problems and personal social skills. The whole instrument consists of 21 questionnaires covering age intervals from 2 to 66 months. Every domain is covered by 6 items, on which parents assess if the child is doing activity regularly, sometimes, or not yet, in order to represent the child's ability to perform a task. The questionnaire is scored by calculating the sum of items at each domain or summing domain scores. The instrument was standardized for the Serbian population (Lozanović et al., 2021).

Procedure

Pediatricians were instructed to give the instrument to the first parent who meets child age criteria and comes for a regular examination, regardless of his/her education, cooperation, or child characteristics. In the most cases, the instrument was assigned during regular pediatric checkups. Parents were informed about the study and they assigned informed consent. Each parent got a set of questionnaires which contained the ISCAD and ASQ-3.

Results

Internal consistency of ISCAD

As can be seen from the Table 1, internal consistency measured by Cronbach's Alpha coefficient is from below 0.8, which is acceptable (on two lowest age intervals) to above 0.9 which is excellent.

Table 1: Internal consistency of ISCAD

Age interval	No. of items	Cronbach's Alpha
2 months	13	0,77
4 months	13	0,78
6 months	21	0,90
10 months	27	0,88
12 months	27	0,83
14 months	26	0,87
18 months	26	0,91
24 months	29	0,88
30 months	27	0,95
36 months	27	0,95
42 months	24	0,97
48 months	24	0,96
60 months	24	0,91

Descriptive statistics

The minimal score on ISCAD, on the total sample, was 0.96 and the maximal 5. The mean score of the total was 4.10 (SD=0.55). The distribution was skewed towards higher scores. According to obtained data, a relatively small number of children live in a non-stimulating environment, but still, 14% of the children are below one standard deviation, and 2.5% of children are below two standard deviations.

The mean scores of the ISCAD scales ranged from 3.70 to 4.65. The lowest mean scores for scales were on the age interval of 14 (M=3.76, SD=.40) and 18 months (M=3.76, SD=.46), 42 (M=3.70, SD=.73), 48 (M=3.65, SD=.80), 60 months (M=3.72, SD=.56).

The lowest mean scores on individual items (mean score below 3.0) were at age intervals of 14 and 18 months: How often did you encourage the child to use the crayons and colour on the paper? (for 10 months: M=2.14, for 12 months: M=2.74) How often did you play with the child pretending to be a cop, doctor, baker, hair stylist, grandma…? (for 10 months: M=2.30, for 12 months: 2.50, for 14 months: M=2.45).

Correlations between ISCAD and ASQ

Table 2 presents correlation results between ISCAD total score and ASQ-3 domains. Obtained correlations are positive which provides support for the conclusion that children whose parents stimulate their development through different activities have higher scores on ASQ domains. The correlations are significant for all age range except for 30 and 42 months.

Table 2: Significant correlations with ASQ-3 domains

Age	1	2	3	4	5
2	.292		.301	.296	
4	.305		.282	.290	.263
6	.276	.224	.310	.320	.230
10	.415	.211		.375	.396
12	.362				.264
14	.361	.392	.353	.420	.306
18				.259	.213
24	.346		.362	.310	.330
30					
36					.286
42					
48	.258		.271	.299	
60	.430		.502	.302	.498

1-communication, 2-gross motor, 3-fine motor, 4-problem solving, 5-personal social skills

Correlations with education and economic status

Neither mother's educational level, nor her economic status was associated with the ISCAD score. The only exception was at 14 months, where the correlation was significant and positive (mother's education level: r=0.275, p<.01; economic status: r=0.278, p<.01).

Discussion and Conclusion

The frequency of the stimulative, learning activities is one of the important aspects of child care quality. However, to our knowledge, there is a lack of self-report measures that could provide reliable data. Parental care quality at early children's age is mostly assessed with observational measures (e.g. Home Observation for Measurement of Environment (HOME) Inventory, Bradley & Caldwell, 1984). Our study aimed to construct a new self-report measure of the frequency of simulative activities between children and parents (*Inventory of simulative activities for child development-ISCAD)* and to determine the validity (ASQ used as a criteria variable), internal consistency (Cronbach)of this instrument. Our results provide support for the conclusion that the constructed instrument has good psychometric properties. Each of the age-appropriate scales shows acceptable to excellent internal consistency.

Results indicated that parents in Serbia relatively frequently engage with children in developmentally supportive activities. However, the obtained results also suggest that approximately one of seven children lives in an environment that is not supportive enough. The lowest scale mean scores were obtained regarding the following age intervals: 14, 18, 42, 48 and 60 months. Item analysis suggests that parents of younger children (14 and 18 months) least frequently engage the child in activities that include role play and using crayons. When it comes to later age (42, 48 and 60 months) it seems that parents avoid teaching children how to use a computer, cellphone or toys with remote control. This result could be interpreted in light of the fear that children would excessively use modern technologies and screens. Further refinement of the instrument will be based on the results of the Rach model and the use of the logit scale for express item difficulty. Special attention will be paid to the age range 30 and 40 months in which correlations with ASQ were not obtained.

Even though earlier research assumed that the mother's education and family's economic status would be associated with the frequency of developmentally stimulating activities, our results didn't support that. One explanation may be related to the measurement method of economic status. We used a scale from 1 to 10, and parents assessed their position relative to other parents in Serbia. The main weakness of this type of measure is its objectivity because most of the parents don't want to answer honestly, or they are not sure where they stand relative to others (Gershoff et al., 2007). Further research should incorporate more complex measures of economic status, such as DHS Wealth Index (Rutsein & Johnson, 2004).

The correlation of the ISCAD scores was correlated with ASQ domains on every age interval, which suggest that ISCAD is a useful self-report measure of care quality which has an effect on a child's developmental status.

References

Black, M. M., Walker, S. P., Fernald, L. C., Andersen, C. T., DiGirolamo, A. M., Lu, C., ... & Lancet Early Childhood Development Series Steering Committee. (2017). *Early childhood development coming of age: science through the life course*. The Lancet, 389(10064), 77-90. https://doi.org/10.1016/S0140-6736(16)31389-7

Bradley, R. H., & Caldwell, B. M. (1984). The HOME Inventory and family demographics. *Developmental Psychology, 20*(2), 315. https://doi.org/10.1037/0012-1649.20.2.315

Gershoff, E. T., Aber, J. L., Raver, C. C., & Lennon, M. C. (2007). Income is not enough: Incorporatin material hardship into models of income associations with parenting and child development. *Child development, 78*(1), 70-95. https://doi.org/10.1111/j.1467-8624.2007.00986.x

Gilkerson, J., Richards, J. A., Topping, K. J. (2017). The impact of book reading in the early years on parent–child language interaction. *Journal of Early Childhood Literacy, 17*(1), 92-110. https://doi.org/10.1177/1468798415608907

Grantham-McGregor, S., Cheung, Y. B., Cueto, S., Glewwe, P., Richter, L., Strupp, B., & International Child Development Steering Group. (2007). Developmental potential in the first 5 years for children in developing countries. *The Lancet, 369*(9555), 60-70. https://doi.org/10.1016/S0140-6736(07)60032-4

National Scientific Council on the Developing Child (2007). *The Science of Early Childhood Development: Closing the Gap Between What We Know and What We Do.*

Retrieved from www.developingchild.harvard.edu. Rutsein, S.O. & Johnson, K. (2004). The DHS Wealth Index. DHS Comparative Reports No.6. ORC Macro

Shonkoff, J. P. (2003). From neurons to neighborhoods: old and new challenges for developmental and behavioral pediatrics. *Journal of Developmental & Behavioral Pediatrics, 24*(1), 70-76. https://doi.org/10.1097/00004703-200302000-00014

Shonkoff JP. (2009). *Investment in early childhood development lays the foundation for a prosperous and sustainable society*. In: Tremblay RE, Boivin M, Peters RDeV, (Eds.) Encyclopedia on Early Childhood Development [online], pp. 1-5, Centre of Excellence for Early Childhood Development and Strategic.

Lozanović, D., Milidrag, M., Bogdanović, R., Sokal-Jovanović, L., Videnović, M., & Stepanović-Ilić, I. (2021). Why and when is it important to use the standardized questionnaire 'Ages & Stages Questionnaires' (ASQ-3)-'Age & development of the child', for assessment and monitoring of children's development in early childhood?. *Timočki medicinski glasnik*, 46(3), 129-131. https://doi.org/10.5937/tmg2103129L

Weisleder, A., & Fernald, A. (2013). Talking to children matters: Early language experience strengthens processing and builds vocabulary. *Psychological science, 24*(11), 2143-2152.

World Health Organization (2018). *Nurturing care for early childhood development: a framework for helping children survive and thrive to transform health and human potential.*

PSYCHOLOGY OF ART

Dance Performance Anxiety – "The Dizziness of Freedom"

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Abstract

This paper explores the dancers' state of anxiety before and after their performance in front of the audience. In the study participated 6 female contemporary dancers aged between 15 and 16 years and each of them performed 3 contemporary choreographies which were made for the purpose of this study. Whole performance of 18 choreographies (6 dancers x 3 choreografies) lasted 1:30h. Dancers filled out the Spielberger's State – Trait Anxiety Inventory before and after the performance. Results have shown that scores on STAI –S are lower after the performance was finished indicating that anxity has been reduced. The results are discussed in the contex of the quality of the dancers' performance and compared with previous findings on the same subject.

Keywords: anxiety; performance; dancers; contemporary choreographies

Introduction

Performance anxiety is commonly called "stage fright" and it can be understood as state of doubt when dancer believes that he or she may not be able to meet the demands that performing requires. As it has been noticed by Walker and Nordin-Bates (2010) cognitive and somatic dance performance anxiety could be differentiated. Somatic expression of performance anxiety may be recognized in the feelings of nausea, dizziness, shaky limbs, and rapid breathing, which could cause the dancer to feel a loss of control. Most of the dancers may cope with "stage fright" by understanding their bodily sensation and acquiring the feeling of control of their bodies. However, more exploration in the domain of dance regarding performance anxiety is needed. This is especially important because of the fact that performance anxiety is mostly explored in sport psychology (c.f. Hanin, 2010; Smith, Smoll, & Schutz, 1990). However little is known about dance performance anxiety which previously has been explored in the context of classical ballet and professional dancers (c.f. Walker & Nordin-Bates, 2010) or in the context of healing (c.f. Hanna, 1995).

Therefore, the purpose of this study was to explore contemporary school dancers' performance anxiety. For the purpose of this research experimental situation was created. In the preparation phase 6 dancers learned 3 different contemporary choreographies designed for this study. When after one month their practice was finished performance in front of the audience was organized in the ballroom of Novi Sad Ballet School. With piano accompaniment, all dancers performed all choreographies in balanced order. Pre and post-performance anxiety was measured. We hypothesized that dancers' anxiety will reduce after the performance.

Method

The aim of this paper is to investigating anxiety of dancers before and after their performance of choreographies in front of the audience.

Participants and Procedure

In the study participated 6 female dancers aged between 15 and 16 years (M= 15.66, SD=.516), which were students of Novi Sad Ballet school, departament of contemporary dance. After they gave their consent to participate in the study, and before the beging of the performance all dancers filled out Spielberger's State – Trait Anxiety Inventory. After that each dancer performed 3 contemporary choreographies in front of the audience. The choreographies were made by Aleksandra Ketig, the chief of contemporary departament for the purpose of this research. Whole performance of 18 choreographies (6 dancers x 3 choreografies) lasted 1:30h. Dancers performed choreographies in balanced order. Furthermore, after the performance was ended they made their evaluations again on the same instrument. Their participation was voluntary and the study was conducted in accordance with the Helsinki Declaration.

Instrument

For measuring state of the anxiety befor and after the performance Spielberger's State – Trait Anxiety Inventory was applied (Spielberger, Gorsuch, & Luschene, 1970). The inventory consists of two scales, one measuring trait of anxiety (STAI –T) and second measuring state of anxiety (STAI –S). Each scale consist of 20 items, and participants give their answers on four-point Likert scale (1 – Not at all; 2 – Somewhat; 3 – Moderately so; 4 – Very much so). The range of scores is between 20 (minimum) and 80 (maximum). Serbian adaptation of this Inventory is made by Mihić and Novović (2018).

Data Analysis

Due to the small number of subjects, nonparametric tests (*Sign test* and *Wilcoxon Signed Ranks Test*) were used to examine differences in dancers' pre-post performance state of anxiety.

Results

Results of Sing test showed that diferences between dancers' pre-post performance anxiety are significant at $p < .031$ (M before = 41.66, SD= 6.77; M after = 29.00, SD = 6.44). Results of Wilcoxon Signed Ranks Test also showed

significan diferences $Z = -2.201$, $p < .028$ (Mean Rank =3.50; Sum of Ranks =21.00). Concerning all dancers who participated in the study results of STAI –S Inventory have shown that their scores related to anxiety reduced after they finished the performance (please see Table 1).

Table 1: Dancers' scores on STAI – S Inventory pre-post performance

STAI-State Score	Dancers					
	1	2	3	4	5	6
Pre-performance	40	48	43	37	32	50
Post-performance	28	27	41	26	22	30

Note: Range of scores are between minimum 20 and maximum 80

Discussion and Conclusion

The results of this study showed that dancers' anxiety reduced after their performance in front of the audience was finished. As it was hypothesized, this result was expected. Furthermore, it is in line with earlier studies which have shown that performance anxiety is very often experienced by dancers, especially in relation to their creativity, self-confidence and psychological skills (Manely & Wilson, 1980; Walker & Nordin-Bates, 2010). Regarding type of dance earlier studies has shown that performance anxiety is more related to ballet dancers (Anshel, 2004; Walker & Nordin-Bates, 2010) than to those who practice other types of dances such as modern dance, hip hop or flamenco (Vukadinović, 2019). Moreover performance anxiety is more characterized for those who practice dance as profession because of their higher responsibility related to job requirements which people who practice dance as recreation does not have (García Dantas, et al., 2018; Langdon & Petracca, 2010). Since this paper was focused on contemporary dancers who were schooling for their future profession of dancer, our results are limited on this context. Other limitations of this research such as small sample should also be acknowledge even though exploration regarding dancers mostly have small sample – up to 15 (c.f. Jola, Davis & Hagard, 2011; Rivière, Fdili Alaoui, Caramiaux, & Mackay, 2018; Walker & Nordin-Bates, 2010). Before final conclusion it is important to mention one more and very possible interpretation of our results. Namely, as it has been shown in earlier studies, dance as a medium and special kind of activity, as well as experience of dancing can significantly reduce anxiety (Hanna, 1995; Vukadinović, 2019).

One of the most important practical implications of this study's findings is related to the importance of developing strategies for coping with performance anxiety. Furthermore, future studies should focus on exploring which of them are most effective and whether there is possibility to include or embed them in the ballet school curriculums.

Based on results of this study, as well as on the above mentioned discussion it can be concluded that anxiety is integral part of dancers' performance. Manely and Wilson (1980, p.11) suggest that is a "vital ingredient for good performance". Understood more widely it is the anxiety that "dizziness of freedom", which allows human being to be creative and therefore to grow and develop their capacity (Kierkegaard, 1844/1980, p. 152).

References

Anshel, M. H. (2004). Sources of disordered eating patterns between ballet dancers and non-dancers. *Journal of Sport Behavior*, *27*, 115–133.

García Dantas, A., Amado Alonso, D., Sánchez Miguel, P. A. (2018). Factors dancers Associate with their body dissatisfaction. *Body Image*, *25*, 40-47. https://doi.org/10.1016/j.bodyim.2018.02.003

Hanin, Y. L. (2010). Coping with anxiety in sport. *Coping in sport: Theory, methods, and related constructs*, *159*, 175.

Hanna, J.L. (1995). The power of Dance: health and Healing. *Journal of Alternative and Complementary Medicine: Research on Paradigm, Practice and Policy*, *1*(4), 323-331.

Jola, C., Davis, A., & Haggard, P. (2011). Proprioceptive integration and body representation: insights into dancers' expertise. *Experimental Brain Research, 213*(2–3), 257–265. https://doi.org/10.1007/s00221-011-2743-7

Kierkegaard, S. (1844/1980). *The concept of anxiety: A simple psychologically orienting deliberation on the dogmatic issue of hereditary sin*. (Reidar Thomte with B. Albert Anderson Trans.). Princeton, New Jork: Princeton University Press.

Langdon, S. W. & Petracca, G. (2010). Tiny dancer: Body image and dancer identity in female modern dancers. *Body Image*, *7*, 360-363. https://doi.org/10.101/j.bodyim.2010.06.05

Manely, ME. & Wilson, V.E. (1980). Anxiety, Creativity, and Dance Performance. *Dance Research Journal, 12*(2), 11-22. https://doi.org/10.2307/1478509

Mihić, Lj. & Novović Z. (Eds) (2018). Charls. D Spielberger (1968). Upitnik anksioznosti kao stanja I osobine ličnosti – STAI. Godina konstrukcije: 1968. Srpsko izdanje 2018. Beograd: Sinapsa edicije.

Rivière, JP., Fdili Alaoui, S., Caramiaux, B., & Mackay, W. E., (2018). How Do Dancers Learn To Dance?: A first-person perspective of dance acquisition by expert contemporary dancers. MOCO '18: Proceedings of the 5th International Conference on Movement and Computing. June 2018 Article 6, 1–7. https://doi.org/10.2307/1478509

Smith, R. E., Smoll, F. L., & Schutz, R. W. (1990). Measurement and correlates of sport-specific cognitive and somatic trait anxiety: The Sport Anxiety Scale. *Anxiety research*, *2*(4), 263-280.

Spielberger, C., Gorsuch, R., & Luschene, R. (1970). Manual for the StateTrait Anxiety Inventory. Palo Alto, California: Consulting Psychologists Press.

Vukadinović, M. (2019). *Psihologija plesa i umetničke igre*. Sombor: Učiteljski fakultet, Novi Sad: Novosadski

centar za istraživanje plesa I umetnost flamenka – La Sed Gitana.

Walker, J. & Nordin-Bates, M. (2010). Performance anxiety experiences of professional ballet dancers: the importance of control. *Journal of dance medicine & Science*, *14*(4), 133-145.

Contemporary and Hip Hop Dance Choreographies: The differences in observers' physical experience

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Abstract

This paper explores the differences in the observers' physical experience when watching contemporary and hip hop dance choreographies. In the study participated 87 students of Novi Sad School of Business. They have watched 5 contemporary and 5 hip hop choreographies, which were presented in the balanced order via LCD projector. They rated their physical experience after each watched choreography on the instrument for measuring physical experience when watching dance which consists of three dimensions: Action tendency, Arousal and Relaxation. Results have shown that there are significant main effect of dance type. Participants rated with significantly higher values hip hop in comparison to contemporary dance choreographies regarding dimension of Action tendency and Arousal. It is concluded that observers' physical experience of contemporary dance as a category of stage dance and hip-hop as a category of street dance differ in their tendency to move and their feeling of impassion when watching choreographies of those different types of dance.

Keywords: physical experience, choreographies, contemporary dance, hip-hop

Introduction

Earlier explorations related to aesthetic experience indicated that there is a motivational, semantic and affective aspect of aesthetic experience (Marković, 2012, 2017). Thus, the main focus of our earlier studies related to watching dance was placed on investigating these aspects of observers' aesthetic experience (Vukadinović & Marković, 2012; Vukadinović, 2017). While researching these aspects questions related to the physical experience of the observers when watching dance have appeared (Vukadinović, 2018). It turned out that little is known about the physical experience as the fourth aspect of aesthetic experience when watching dance. This research aims at investigating the differences in the observers' physical experience when watching dance choreographies.

For the purpose of this research, contemporary dance as a category of "Stage dance" and hip-hop as a category of "Street dance" are chosen. Beside the contemporary dance in the category of "Stage dance" modern dance and classical ballet are included. On the other hand, the category of "Street dance" beside hip hop, includes lyrical hip-hop, Breaking, B-boying, Krump, Stepping and Waacking. This categorization derived from *So You Think You Can Dance*, American televised competition that has aired on Fox since year 2005. Furthermore, to control for as much variables as possible, in this study choreographies that are used are downloaded from *So You Think You Can Dance*, a TV series, so that they have similar duration (up to 2 min), dancers performing them are similar in age, dance training and in high level of dance technique. However, variable of music which was accompanying these choreographies was not controlled.

Since our previous study have shown that observers differ in their rating of aesthetic experience of these two types of dance, evaluating contemporary dance as more elegant, seductive and sensitive (Vukadinović, 2017) it may be hypothesized that observers' physical experience of contemporary and hip hop dance which is explored in present study will as well significantly differ.

Method

This aim of this research is to explore the differences in the observers' physical experience when watching hip-hop and contemporary dance choreographies.

Participants and Procedure

There were 87 students aged between 18 and 22 years (M=19.65, SD=.925, 58.6% woman) from Novi Sad School of Business participating in the study. Their task was to wach ten choreographies and to rate them on the instrument measuring physical experience when watching dance. Video recordings of ten choreographies were presented to the participants via LCD projector which they were observing in the group.

Participants did not have any formal education in dance or experience in dance training. They participated voluntarily and the study was conducted in accordance with the Helsinki Declaration.

Stimuli

Stimuli consisted of ten choreographies that included five contemporary dance choreographies and five of hip-hop. Choreographies were originally performed within American televised dance competition show *So You Think You Can Dance* that aired on Fox between 2008 and 2016. The recorded choreographies are taken from the Internet and adapted for research purposes.

Contemporary dance choreographies included:
1. *"How it ends" – De VotchKa*
   https://www.youtube.com/watch?v=9YbEtfJryXA
2. *"Medicine" – Daughter*
   https://www.youtube.com/watch?v=LXvCEfq39ws
3. *"Mirror" - Alexandre Desplat*
   https://www.youtube.com/watch?v=DctLJHiJgOI
4. *"Tore my Heart" – Oona & Dave Tweedie*

5. *"The Gulag Orkestar Beirut"*
   https://www.youtube.com/watch?v=lecijwOXX1g

Hip-hop choreographies included:

6. *"Run the World (Girls)" – Beyonce*
   https://www.youtube.com/watch?v=qdxxN0sUsUI
7. *"Outta your Mind" – Lil Jon & LM*AO7*
   https://www.youtube.com/watch?v=mhyWzC7df-0
8. *"Get Low" – Dilan Francis & DJ Snake*
   https://www.youtube.com/watch?v=neexFho8Z0I
9. *"Hello Good Morning (Remix)" – Diddi Dirty Monay*
   feat. Nicky Minay & Rick Ross
   https://www.youtube.com/watch?v=tCb_UOakEQI
10. *"My Chick Bad" – Ludacris & Nicky Minay*
    https://www.youtube.com/watch?v=XrT5ca9EbTw

All videos were downloaded from the Internet and adapted for the purpose of this research. Choreographies are presented in balanced order.

Instrument

The instrument for measuring physical experience of dance performances, used in this research, was defined in a previous study (Vuadinović & Marković, 2021). It consists of 12 seven-point scales measuring three dimensions of physical experience: Action tendency (*I feel like dancing, I feel like moving, I feel vibrations* and *I feel vivacious*), Arousal (*I feel impassioned, I feel pride, I am cheerful* and *I feel effused*) and Relaxation (*I am touched, I feel warmth, I feel calm* and *I feel blissful*).

Data Analysis

Data analysis was performed using statistical software SPSS for Windows v25.0. To explore the main effect of the type of dance regarding observers' evaluations of the dimensions of physical experience of dance, General Linear Model – Repeated Measures was used.

Results

The results have shown that there is a significant main effect of Type of dance ($F(3,84) = 15.450$, $p < .001$). Univariate tests have shown that there are significant differences regarding dimension of Action tendency ($F(1,86) = 40.239$, $p < .001$) and dimension of Arousal ($F(1,86) = 17.317$, $p < .001$) between students' ratings when watching contemporary and hip hop dance choreographies.

Observers rated with significantly higher values choreographies of hip hop regarding dimensions of Action tendency ($M=3.76$, $SD=.148$) and Arousal ($M=3.38$, $SD=.088$) in comparison with choreographies of contemporary dance (Action tendency: $M =3.26$, $SD =.114$; Arousal: $M=3.11$, $SD= .111$).

Discussion and Conclusion

As it was hypothesized the findings of this study have shown difference related to observers' physical experience when watching contemporary and hip hop choreographies.

Choreographies of hip hop turn to be more moving and rated with higher values regarding Action tendency. This result could be interpreted in few ways. Firstly, contemporary dance, which is previously assessed as more elegant and sensitive (Vukadinović, 2017) differ not just in categorization ("stage" vs. "street dance") but as well in formal characteristics (dance technique, elegance, complexity) from hip hop. For example, it is possible that due to the more complex movements of the contemporary dance observers' rate their physical experience with lower values. That would be in line with previous studies which showed that the complexity of movements influence and shape audiences' experience (Glass, 2005; Hagendoorn, 2004; Jola, Ehrenberg & Reynolds, 2011)

Secondly, our results which indicate that observers evaluate Action tendency and Arousal with higher values regarding hip hop could be explained by the fact that possibly hip hop is groovy and has more rhythmical movements (but it is not less complicated in technique). As earlier studies have shown music can stimulate the process of pumping blood into the leg muscles and a hand which can be a potential reason why people are tapping with rhythm with toes or legs (Thaut, McIntosh, & Hoemberg, 2015; Thaut, Trimarchi, & Parsons, 2014). In addition, the rhythm can cause changes in heart rate and in the work of the respiratory system so that a person very often synchronizes breathing with music (Cervellin & Lippi, 2011; Tormodsdatter Færøvik, 2017). Moreover, it has been shown that dimension of Action tendency is related to the observers' desire to move as well as with the concept of kinesthetic empathy (c.f. Vukadinović & Marković, 2021). Kinesthetic empathy is related to the observers' pleasure of imagining themselves doing the movement and their bodily sensations such as my heart beats faster, I have butterflies in my stomach, I feel vibrations in my body, I mimic the movements while I sit (c.f. Vukadinović & Marković, 2021). Although contemporary and hip hop dance are very different regarding their formal characteristic, the lack of the control of variables related to the music which accompanied choreographies (such as participants preferences, differences in music's meter, tempo and pattern), leads us to the conclusion that these results should be taken with caution. In some future studies the influence of music on the observers' experience of dance should be empirically tested.

Having in mind above mentioned discussion it can be concluded that results of this study indicate that observers' physical experience of two types of dance – contemporary as a category of stage dance and hip-hop as a category of street dance differ in their tendency to move and their feeling of impassion when watching dance choreographies.

Even though it can be said that contemporary dance is more elegant and sensitive, hip hop dance seems to have higher potential to move the observers.

References

Cervellin, G., & Lippi, G. (2011). From music-beat to heart-beat: a journey in the complex interactions between music, brain and heart. *European journal of internal medicine*, *22*(4), 371-374.

Glass, R. (2005). Observer response to contemporary dance. In Grove, R., Stevens, C. & McKechnie, S (Eds.). *Thinking in four dimensions: Creativity and cognition in contemporary dance* (pp. 107–121). Carlton: Melbourne University Press.

Hagendoorn, I. (2004). Some speculative hypotheses about the nature and perception of dance and choreography. *Journal of Consciousness Studies*, *11*(3-4), 79-110.

Jola, C., Ehrenberg, S., & Reynolds, D. (2011). The experience of watching dance: Phenomenological-neuroscience duets. *Phenomenology and the Cognitive Sciences*, *11*(1), 17-37. https://doi.org/10.1007/s11097-010-9191-x

Marković, S. (2012). Components of aesthetic experience: aesthetic fascination, aesthetic appraisal, and aesthetic emotion. *i-Perception, 3*(1), 1-17. https://doi.org/10.1068/i0450aap

Marković, S. (2017). *Domeni estetske preferencije. Od estetskog stimulusa do estetskog doživljaja.* Beograd: Filozofski fakultet, Univerzitet u Beogradu.

Thaut, M. H, Trimarchi, P. D., & Parsons, L. M. (2014). Human brain basis of music rhythm perception: common and distinct neural substrates for meter, tempo and pattern. *Brain Science*s, *4*, 428-452.

Thaut, M. H., McIntosh, G. C., & Hoemberg, V. (2015). Neurobiological foundations of neurologic music therapy: rhythmic entrainment and the motor system. *Frontiers in Psychology*, *5*

Tormodsdatter Færøvik, H. U. (2017). *Music and heart rate. Physiological effects from listening to music in different tempos.* Master Thesis. Bergen: Universitetet i Bergen det Psykologiske Fakultet.

Vukadinović, M. & Marković, S. (2012). Aesthetic experience of dance performances. *Psihologija*, *45(*1), 23-41. https://doi.org/10.2298/PSI1201023V

Vukadinović, M**.** (2017). The differences in the aesthetic experience of contemporary and hip-hop dance choreographies. *ZBORNIK RADOVA SA XXIII NAUČNOG SKUPA "Empirijska istraživanja u psihologiji"*, 62-68. Beograd: Institut za psihologiju i Laboratorija za psihologiju, Beograd.

Vukadinović M. (2018). The relationship between observers' somatic reactions and aesthetic experience when watching contemporary dance choreographies. *KNJIGA REZIMEA SA XXIV NAUČNOG SKUPA "Empirijska istraživanja u psihologiji"*, 54-55. Beograd: Institut za psihologiju i Laboratorija za psihologiju.

Vukadinović, M. (2019). *Psihologija plesa i umetničke igre*. Sombor: Učiteljski fakultet, Novi Sad: Novosadski centar za istraživanje plesa I umetnost flamenka – La Sed Gitana.

Vukadinović, M. & Marković, S. (2021). Factor structure of audiences' physical experience while watching dance *PsyCh Journal*, version on line. https://doi.org/10.1002/pchj.513

SOCIAL PSYCHOLOGY

Attitudes towards Vaccination against COVID-19 among Roma People from Belgrade's Substandard Settlements

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Abstract

Previous findings showed that the percentage of people who oppose vaccination against COVID-19 varies from country to country, and in Serbia it is between 10% and 30%. Since previous research did not include Roma people from substandard settlements in Belgrade, which are densely populated in small areas, we decided to examine their attitudes.

We asked 119 Roma people (51.5% males) aged 18 to 61 years (M = 38.53; SD = 8.34) from substandard settlements in Belgrade several questions about their attitudes towards vaccination against COVID-19.

About 60% of them accept vaccination, while 12% consider it ineffective and 12% consider it hazardous. Almost 80% reported that they are either insufficiently informed or not informed at all about vaccines, and the vast majority (83%) use public media for informing themselves. Also, many more respondents emphasized financial aid for vaccinated citizens and certificates for travel abroad than the medical benefits of vaccination.

This basic insight into this topic shows that opposition to vaccination in substandard settlements is similarly widespread as among the general population (which is not infrequent), that awareness is worryingly low, and that the public media is almost the only channel for information. The results also indicate that the medical benefits of vaccination should be more emphasized in communication about this issue.

Keywords: COVID-19 vaccines; attitudes towards vaccination; Roma people; substandard settlements in Belgrade

Introduction

The COVID-19 pandemic affected almost the entire world in 2020. Faced with an unknown virus that spreads extremely fast and can be fatal, medical scientists and the pharmaceutical industry worked intensively to make a vaccine.

Various conspiracy theories emerged immediately after the pandemic began (Čavojová et al., 2021; Gogarty & Hagle, 2020; WHO, 2021), and their scope was extended to vaccines after different types of vaccines were made in early 2021. The spread of "information" that vaccines are ineffective or even dangerous has led to mistrust and rejection of vaccination in a significant number of people (van Mulukom et al., 2020; Žeželj et al., 2021). Also, it turned out that people who endorse pandemic-related conspiracy beliefs are more likely to believe that pseudoscientific cures, such as consuming megadoses of garlic or vitamins, eating bacon, or drinking brandy, can prevent or cure COVID-19 (Pavela Banai et al., 2021).

In the middle of 2021, about 50% of the population in Serbia was vaccinated (Chen, 2021; Žeželj et al., 2021), while the results of research conducted on a representative sample (DEMOSTAT, 2020; Žeželj et al., 2021) showed that between 10% and 30% of citizens oppose vaccination against the COVID-19 virus. Contrary to the active campaign for vaccination by state authorities, "experts" who were opposed to vaccination were frequently present in the public media (Žeželj et al., 2021), which probably had an impact on reducing support for vaccination.

The Roma population in Serbia and in Europe in general faces serious problems such as lack of opportunities for educational and professional development, poverty, and discrimination (Chireac & Arbona, 2016; Klaus & Marsh, 2014; McGarry, 2014; Milkova & Larkins, 2020), and the pandemic of the COVID-19 virus has made their position in various domains of life even more difficult (Babović, 2021; Berta, 2020).

Since previous research concerning attitudes on vaccination against COVID-19 did not include the Roma population from substandard settlements in Belgrade, we decided to explore this topic in cooperation with the NGO ADRA, an organization that works on education, medical and psychosocial support for this population.

Our research also had a practical purpose of helping improve the communication strategy about the benefits of vaccination against the COVID-19 virus at a time when almost no one in this population had been vaccinated. This was especially important because it is a population that in large numbers inhabits a small space, and that is a factor that is suitable for the spread of viruses such as COVID-19.

Method

Instrument

In cooperation with the NGO ADRA field workers, we created a short questionnaire with multiple choice questions in order to gain basic insight into the attitudes about vaccination against COVID-19 among people from substandard settlements in Belgrade.

Participants

Our research involved 206 participants (51.6% males), aged 18 to 61 years (*M* = 38.53 years, *SD* = 8.34), from the population of Roma people who live in 5 substandard settlements in Belgrade.

Procedure

The respondents were individually tested. Examiners read questions from the paper sheet and recorded their answers. Data collection was performed in May 2021.

Results

The results showed that 69.9% of respondents stated that they regularly vaccinated their children with the necessary vaccines (e.g. against diphtheria or tetanus), while 30.1% did not do that.

60.7% of respondents believe that vaccines against the COVID-19 virus provide protection, while 12.1% state that vaccines do not provide protection. Also, 12.1% of respondents claimed that vaccines were hazardous, and 15% stated that they did not have a clear opinion on the matter.

Similarly, when asked if they had any reason to oppose vaccination, 59% of respondents stated that they are not against vaccination, 17% said that they are afraid of technical factors (e.g. needles) in the vaccination process, 7.3% stated that vaccines can cause more severe diseases, and 9.8% claimed that vaccines can do more harm than good to health.

When we asked respondents to rate their awareness of the COVID-19 vaccines, 21.8% of them stated that they were not informed at all, 57.8% said they were insufficiently informed, and only 20.4% claimed that they were fully informed. Female respondents were more likely ($\chi2$ ($N = 206) = 18.79$; $p < .001$) to report that they were not informed at all. Finally, 83% of respondents stated that they use public media (TV, newspapers, etc.) to get information concerning vaccination against the COVID-19 virus, 16% got information from friends or neighbors, while only 1% said they asked a doctor or medical staff about it. However, 80.2% of them said that it would be useful for them if a doctor visited their settlement and gave them the necessary information about the benefits of vaccination.

Speaking of the benefits of vaccination, only 37.9% of respondents mentioned that vaccines prevent infection or ease the symptoms of the disease; 76.7% said that travel abroad requires a vaccination certificate, and 84% spoke about the financial aid (3000 rsd) from the state for vaccinated citizens.

Discussion

Our research was aimed at gaining basic insight into the attitudes about vaccination against the COVID-19 virus among the Roma population from substandard settlements in Belgrade at a time (mid-2021) when almost none of them had been vaccinated. Although we asked only a few questions, it can be said that we got useful basic insight on this topic, which was later used to communicate the benefits of vaccination.

The answers to two questions showed that the percentage of respondents who are against vaccination for various reasons (ineffectiveness of vaccines, their harmfulness, or technical factors such as needles) is similarly widespread as in the general population (DEMOSTAT, 2020; Žeželj et al., 2021) - between 10% and 30%. Considering the characteristics of the COVID-19 virus and the ease of its spread, it can be said that the opposition to vaccination among this population is not infrequent. Also, this population is densely populated in small areas, so combating the spread of the virus is a particular challenge.

The results also show that self-reported awareness about COVID-19 vaccines among this population is at a very low level, which is also a worrying result, since it is already known (Lobato et al., 2014; Rizeq et al., 2021) that poorly informed people are more likely to build some sort of "conspiracy theories" about vaccines and other medical products.

In the context of awareness, another reason for concern is the source from which this population receives information: the overwhelming majority of them mentioned only the public media, in which "experts" who oppose vaccination often appear (Žeželj et al., 2021), and that can also have a negative impact on the vaccination campaign. At the same time, almost none of the respondents received information about the issue of vaccination against the COVID-19 virus from doctors or other competent persons. However, the encouraging result is that the vast majority of them are ready to hear the arguments in favor of vaccination from a doctor.

Finally, many more respondents stated that they heard about the accompanying benefits of vaccination (financial aid and COVID-19 certificate) than about the effects of vaccines in the fight against the virus and its symptoms, which indicates that the medical benefits of vaccination should be more emphasized in communication about this issue.

The results of this research were used for practical purposes: the NGO ADRA implemented a vaccination campaign in these settlements. Therefore, we can suggest future research to examine how many people in this population have been vaccinated so far.

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References

Babović, M. (2021). *Leave no one behind! Progress made in accomplishing Sustainable Development Goals among the population of Roma settlements in Serbia.* Statistical Office of the Republic of Serbia.

Berta, P. (2020). Ethnicizing a pandemic: COVID-19, culture blaming and Romanian Roma. *Society for Romanian Studies Newsletter*, *42*(1), 1-7.

Čavojová, V., Šrol, J., & Mikušková, E. B. (2021). *With the little help of science understanding: Examining the direct and indirect role of scientific reasoning and trust in science in normative health behaviour during pandemic*

[Preprint]. PsyArXiv. https://doi.org/10.31234/osf.io/xahdj

Chen, Y. T. (2021). The effect of vaccination rates on the infection of COVID-19 under the vaccination rate below the herd immunity threshold. *International Journal of Environmental Research and Public Health*, *18* (14), 7491. https://doi.org/10.3390/ijerph18147491

Chireac, S. M., & Arbona, A. D. (2016). Improving and protecting human rights: A reflection of the quality of education for migrant and marginalized Roma children in Europe. *Regions and Cohesion*, *6*(3), 52-76. https://doi.org/10.3167/reco.2016.060303

DEMOSTAT (2020). Javno mnjenje Srbije o kovidu-19, https://demostat.rs/sr/vesti/istrazivanja/prezentacijaistraz ivanja-javno-mnjenje-srbije-o-kovidu-19/1009

Gogarty, K., & Hagle, C. (2020). A guide to right-wing media reactions and conspiracy theories surrounding coronavirus. *Media Matters Am*, *20*, 28.

Klaus, S. & Marsh, A. (2014). A special challenge for Europe: The inclusion of Roma children in early years education and care. *European Early Childhood Education Research Journal*, *22*, 336-346. https://doi.org/10.1080/1350293X.2014.912896

Lobato, E., Mendoza, J., Sims, V., & Chin, M. (2014). Examining the relationship between conspiracy theories, paranormal beliefs, and pseudoscience acceptance among a university population: Relationship between unwarranted beliefs. *Applied Cognitive Psychology*, *28*(5), 617–625. https://doi.org/10.1002/acp.3042

McGarry, A. (2014). Roma as a political identity: Exploring representations of Roma in Europe. *Ethnicities*, *14*, 756-774. https://doi.org/10.1177/1468796814542182

Milkova, R. & Larkins, C. (2020). Roma Children's Participation: Shaping Responses to COVID-19 in the EU and Bulgaria. *Discussion Paper*. Retrieved from http://clok.uclan.ac.uk/33616/1/4%20Roma%20Children %27s%20Participation%20-%20COVID-19%20and%20the%20EU.pdf

Pavela Banai, I., Banai, B., & Mikloušić, I. (2021). Beliefs in COVID-19 conspiracy theories, compliance with the preventive measures, and trust in government medical officials. *Current Psychology,* 1-11. https://doi.org/10.1007/s12144-021-01898-y

Rizeq, J., Flora, D. B., & Toplak, M. E. (2021). An examination of the underlying dimensional structure of three domains of contaminated mindware: Paranormal beliefs, conspiracy beliefs, and anti-science attitudes. *Thinking & Reasoning*, *27*(2), 187–211. https://doi.org/10.1080/13546783.2020.1759688

Van Mulukom, V., Pummerer, L., Alper, S., Bai, H., Cavojova, V., Farias, J. E. M., Kay, C. S., Lazarevic, L. B., Lobato, E. J. C., Marinthe, G., Pavela Banai, I., Šrol, J., & Žeželj, I. (2020). *Antecedents and consequences of COVID-19 conspiracy beliefs: A systematic review* [Preprint]. PsyArXiv. https://doi.org/10.31234/osf.io/u8yah

WHO. (2021). *Coronavirus disease (COVID-19) advice for the public: Mythbusters*. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/myth-busters

Žeželj, I., Petrović, M., Ivanović, A., & Kurčubić, P. (2021). *I trust my immunity more than your vaccines:"Appeal to nature" bias strongly predicts questionable health behaviors in the pandemic.* [Preprint]. PsyArXiv. https://doi.org/10.31234/osf.io/y25bs

114

Will this Cost us Votes?
Voting Preferences in Light of Public Support of the Preventive Measures

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Abstract

Avoidance of unpopular policies to retain voters might be especially problematic in emergency situations requiring swift and stern governmental response. The study tested whether unpopular political decisions during the COVID-19 pandemic are related with changes in voting preferences. A multilevel probabilistic sample of Slovenians collected in April and May 2020 was used to test whether lower support of the measures is predictive of change in voter preference. We ran a logistic regression and controlled for perceived effectiveness of the measures, respondents' political orientation, their trust in the government, and satisfaction with living conditions in Slovenia. The model had weak predictive power and reported support of the measures was unrelated to the change in voting preference (but related to the satisfaction with living conditions). Those perceiving the measures as effective were less likely to change their vote, as were those ideologically closer and more trusting towards the government. While our findings suggest that politicians have little to fear in terms of voter retention when implementing the measures in the early stages of the outbreak, the results are affected by the epidemiological and political zeitgeist. Future studies should thus focus on cross-national data from various stages of the pandemic to improve generalizability and validity of the results.

Keywords: voter preference; COVID-19 pandemic; protective measures; trust in government; political orientations

Introduction

There is a pervasive common-sense belief that politicians and political parties tend to avoid unpopular policies (e.g., those lowering the standard of living or curbing civic liberties) to retain their voters. This issue might be especially problematic in situations such as the COVID-19 pandemic that require swift, but also stern, governmental response. Many of the implemented policies, even if unavoidable, are likely to cause some unease in the population and, at worst, can result in civil unrest, frequently observed across the world since the outbreak of the pandemic. On the other hand, delays in the implementation of COVID-19 measures might be detrimental to public health, people's well-being, and economy (see Lep et al, 2020). Thus, politicians should be wary of such aberrant conclusions.

Indeed, the notion that "unpopular" policies will influence voting decisions is not (entirely) grounded in voting data (Elmelund-Præstekær & Emmenegger, 2013; Salmon, 1993; Tobin et al., 2021). While the introduction of some policies might lower the support for a ruling party or a politician, such outcome is linked more with timing of these decisions (Djourelova & Durante, 2022; König & Wenzelburger, 2017), their efficiency (Chiu, 2002), or framing (Tobin et al.,

2021). Moreover, it is important how volatile the public opinion is (and how loyal the voters), as implementation of popular policies was found more likely if voters were willing to shift their votes (Gunterman & Persson, 2021).

The present study aimed to test empirically whether unpopular political decisions during the pandemic are related with changes in voting preferences. A probabilistic sample of Slovenians was used in the analyses, which might be especially interesting as both the political landscape and epidemiological situation in Slovenia has been rather volatile since the beginning of the pandemic (change of the government, numerous protests, ever-changing measures, etc.).

While we are not aware of any studies exploring whether people withdrew their support to the ruling politicians as a function of COVID-19 related measures in terms of voting directly, the literature suggests that support of such measures is linked, for example, with the support for the ruling party (Jørgensen et al., 2021), partisan polarization (Vlandas & Klymak, 2021), timing of the measures, and trust in the government (Altiparmakis et al., 2021). In addition, the timing of measures can impact public trust in the government and satisfaction with democracy (Bol et al., 2021). Thus, in our logistic regression models, we also controlled for the perceived effectiveness of the measures, respondents' political orientation, their trust in the government, and their satisfaction with various aspects of life in Slovenia.

Method

Participants and procedure

Data was drawn from Slovenian Public Opinion 2020/1 (SPO) survey, conducted in April and May 2020 (Hafner Fink, Kurdija et al., 2020) using paper and online survey. The target sample was set at 2.000 participants and response rate was 44.4% (see Hafner-Fink, Broder et al., 2020). The representative multilevel probabilistic sample thus comprised 853 Slovenians aged 18 and above who completed the entire survey ($M_{age} = 49.3$, $SD = 17.2$; 47% male).

Measures

Two sets of questions were included in the survey: *The Mirror of Public Opinion* (including recurring topics of the Slovenian Public Opinion survey), and a current set of questions on life and attitudes during the COVID-19 epidemic.

Satisfaction with COVID-19 measures was assessed using a 5-point scale asking the participants to rate how

appropriate the introduced measures were (1 – *too lenient*, 3 – *appropriate*, 5 – *too strict,* and the option *I don't know*).

Perceived effectiveness of the measures was assessed using a 5-point scale (1 – *inefficient*, 5 – *efficient*), with the option of *I don't know*.

Political orientation of the respondents along the left-right continuum was assessed using a 10-point self-report scale.

Trust in the government related to the COVID-19 pandemic was assessed using a 5-point scale (1 – *I do not trust at all*, 5 – *I trust strongly*) with the option *I don't know*.

Satisfaction with life in Slovenia Participants reported how satisfied they are at present with the state of economy, education, healthcare, and democracy in Slovenia using a 5-point rating scale. The responses were then combined into a single measure of political satisfaction ($\alpha = .78$).

Voting preferences The change in voting preference was derived from participant's responses about the current party preference and self-reported voting choice in the past elections (if they responded to both questions). The binary variable was coded as 0 if the voting preference remained the same and 1 if the responses differed. We calculated the change on both the party and the coalition level (at the time of data collection), where we considered the change present if the participant voted for one of the coalition members in the past elections but would not do so now. Around a half of participants (276 of 571, 48.3%) changed their voting preference on party level, and 77 (15.5%) did so on the coalition level.

Results

We tested two binary logistic regression models with change in voting preference as the outcome variable and satisfaction with measures, their perceived efficiency, political orientation, satisfaction with living conditions (political satisfaction), and trust in the government as predictors. The complete models had weak predictive power (pseudo R^2s = .04–.05; see Tables 1 and 2). The reported support of the measures was unrelated to the change in voting preference either on party or coalition levels. The change, however, was related to the lower political satisfaction.

Because some the predictors were moderately correlated (*r*s between -.33 and .52) which could render them insignificant in a joint model, we also tested their

independent contributions to the outcome variable. In those separate models, those who perceived the measures as effective were found less likely to change their vote ($\beta = -.18$, $p = .05$), as were those ideologically closer ($\beta = -.08$, $p = .01$) and more trusting towards the government at the time ($\beta = -.15$, $p = .03$). Still, the predictive power of these models was close to negligible (pseudo R^2s = .01–.03).

Discussion

The data fails to show a significant change in voter preferences due to the introduction of COVID-19 related measures, which could suggest that politicians have little to fear in terms of voter retention when implementing the protective measures in the early stages of the outbreak. The results, however, are undoubtedly affected by the epidemiological and political zeitgeist. The data was collected in the early stages of the epidemic when the measures were less strict then later in its course, when the readiness of the public to comply could be higher (Lep et al, 2021), and dissatisfaction with the measures less pronounced, which could lower the predictive power of the tested models.

Moreover, the results could be affected by sometimes attributed but empirically unvalidated voter loyalty to the right-wing party ruling at the time or by the general dissatisfaction with the government. Still, the significance of some predictors which is in line with findings regarding the support of the measures from abroad (e.g., Jørgensen et al., 2021) suggests that there is a possibility of aggravation of public opinion as the pandemic unfolded which could result in higher voting volatility.

The study used self-reported change in voting preference, which presents a limitation to the study design as such reports are prone to voluntary (reporting bias) and involuntary (reporting error, indecisiveness) self-report bias (see Abelson et al., 1992). In calculating voting preference change, we also dealt with significant sample attrition due to missing values (also because of low turnout in the previous election). To enable any generalisation, future studies should thus employ a cross-national design (controlling for both the differences in the unfolding of the pandemic, the differences in the political settings, and support of the government) and account for differences in severity of the outbreak and measures at various stages of the pandemic using more recent data.

Table 1: Results of a logistic regression predicting voting change on a party level.

	β	*SE*	*p*
(constant)	1.35	0.71	.060
Satsifaction with measures	−0.03	0.12	.787
Measures efficiency	−0.08	0.12	.488
Political orientation	−0.04	0.04	.321
Political satisfaction	−0.14	0.06	.019[*]
Trust in government	−0.08	0.10	.435

[*]Significant at *p* < .05.

Table 2: Results of a logistic regression predicting voting change on a coalition level.

	β	*SE*	*p*
(constant)	−1.36	1.05	.200
Satsifaction with measures	−0.08	0.19	.684
Measures efficiency	0.17	0.19	.381
Political orientation	0.12	0.06	.041[*]
Political satisfaction	−0.18	0.09	.046[*]
Trust in government	−0.17	0.16	.303

[*]Significant at *p* < .05.

References

Abelson, R. P., Loftus, E. F., & Greenwald, A. G. (1992). Attempts to improve the accuracy of self-reports of voting. In J. M. Tanur (Ed.), Questions about questions: Inquiries into the cognitive bases of surveys (pp. 138–153). Russell Sage Foundation.

Altiparmakis, A., Bojar, A., Brouard, S., Foucault, M., Kriesi, H., & Nadeau, R. (2021). Pandemic politics: Policy evaluations of government responses to COVID-19. *West European Politics*, *44*(5–6), 1159–1179. https://doi.org/10.1080/01402382.2021.1930754

Bol, D., Giani, M., Blais, A., & Loewen, P. J. (2021). The effect of COVID-19 lockdowns on political support: Some good news for democracy? *European Journal of Political Research*, *60*, 497–505. https://doi.org/10.1111/1475-6765.12401

Chiu, Y. S. (2002). On the feasibility of unpopular policies under re-election concerns. *Southern Economic Journal*, *68*(4), 841–858. https://doi.org/10.2307/1061495

Djourelova, M., & Durante, R. (2022). media attention and strategic timing in politics: Evidence from U.S. presidential executive orders. *American Journal of Political Science*. Advance online publication. https://doi.org/10.1111/ajps.12683

Elmelund-Præstekær, C., & Emmenegger, P. (2013). Strategic re-framing as a vote winner: Why vote-seeking governments pursue unpopular reforms. *Scandinavian Political Studies*, *36*(1), 23–42. https://doi.org/10.1111/j.1467-9477.2012.00295.x

Guntermann, E., & Persson, M. (2021). Issue voting and government responsiveness to policy preferences. *Political Behavior*, *43*, 1825–1828. https://doi.org/10.1007/s11109-021-09716-8

Hafner-Fink, M., Broder, Ž., Doušak, M., Falle-Zorman, R., Gerdina, O., Jagodic, A., Kecman, I., Kurdija, S., Miheljak, V., Polič, M., Uhan, S., Toš, N., Vovk, T., Zajšek, Š., & Malnar, B. (2020). *Slovensko javno mnenje 2020/1 – Poročilo o izvedbi raziskave in sumarni pregled rezultatov* [Slovenian Public Opinion 2020/1 – Report on the survey and summary of the results]. The Public Opinion and Mass Communication Research Centre, Faculty of Social Sciences, University of Ljubljana.

Hafner Fink, M., Kurdija, S., Malnar, B., Polič, M., & Uhan, S. (2020). *Slovenian Public Opinion 2020/1: Mirror of Public Opinion, Life and attitudes during the COVID-19 epidemic* (ADP - IDNo: SJM201) [Data file]. University of Ljubljana, Slovenian Social Science Data Archives. https://doi.org/10.17898/ADP_SJM201_V1

Jørgensen, F., Bor, A., Fly Lindholt, M., & Bang Petersen, M. (2021). Public support for government responses against COVID-19: Assessing levels and predictors in eight Western democracies during 2020. *West European Politics*, *44*(5–6), 1129–1158. https://doi.org/10.1080/01402382.2021.1925821

König, P., & Wenzelburger, G. (2017). Honeymoon in the crisis: A comparative analysis of the strategic timing of austerity policies and their effect on government popularity in three countries. *Comparative European Polititics*, *15*, 991–1015. https://doi.org/10.1057/cep.2016.1

Lep, Ž., Babnik, K., & Hacin Beyazoglu, K. (2020). Emotional responses and self-protective behavior within days of the COVID-19 outbreak: The promoting role of information credibility. *Frontiers in Psychology*, *11*, Article 1846. https://doi.org/10.3389/fpsyg.2020.01846

Lep, Ž., Ilić, S., Teovanović, P., Hacin Beyazoglu, K., & Damnjanović, K. (2021). One hundred and sixty-one days in the life of the Homopandemicus in Serbia: The contribution of information credibility and alertness in predicting engagement in protective behaviors. *Frontiers in Psychology*, *12*, Article 631791. https://doi.org/10.3389/fpsyg.2021.631791

Salmon, P. (1993). Unpopular policies and the Theory of representative democracy. In A. Breton, G. Galeotti, P. Salmon, & R. Wintrobe (Eds.), *Preferences and democracy* (pp. 13–39). Springer, Dordrecht. https://doi.org/10.1007/978-94-011-2188-0_2

Tobin, J. L., Schneider, C. J., & Leblang, D. (2022). Framing unpopular foreign policies. *American Journal of Political Science*. Advance online publication. https://doi.org/10.1111/ajps.12670

Vlandas, T., & Klymak, M. (2021). Pandemic and partisan polarisation: Voter evaluation of UK government handling during Covid-19. *Swiss Political Science Review*, *27*, 325–338. https://doi.org/10.1111/spsr.12457

The Mediating and the Moderating Role of Civic Orientations in Promoting Youth Civic Participation

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Abstract

While cognitive-affective evaluations of politics (e.g., political interest) contribute to civic participation of youth, their power in predicting the participation is limited. Here, we thus considered youth's perceptions of citizenship and the role of citizens in politics by examining four distinct civic orientations (dutiful, optional, individual, collective) which might hinder or enhance the power of psychological predictors in explaining the participation. Our aim was to contrast two possible pathways towards civic participation: a mediated (psychological predictors contribute to the formation of civic orientations which, in turn, influence participation) and a moderated one (civic orientations are preformed positions that moderate the relationship between the psychological predictors and civic participation). While the relationship between psychological predictors and civic participation in 375 Slovenian emerging adults was mediated through the individual orientation, the results support the moderated relationship for dutiful and optional civic orientations. Higher levels of dutiful orientation strengthened the relationship between political interest and civic participation, and higher levels of optional orientation canceled out the predictive power of political self-efficacy.

Keywords: civic participation; political interest; civic orientations; political engagement; emerging adults

Introduction

It is well established that various psychological characteristics, including cognitive-affective evaluations of politics (e.g., political interest, satisfaction with democracy, and political self-efficacy), contribute to civic participation of youth (see Barrett & Zani, 2015; Pancer, 2015 for a review). Those characteristics, however, have limited power in predicting youth participation as some civically inactive youth still report considerable levels of civic knowledge and psychological engagement in civic and political issues (Amnå & Ekman, 2013).

To better understand how and why these predictors (fail to) contribute to participation, it is also important to consider how young people construe their identity as members of the community (i.e., their civic identity) and how they perceive the participation in terms of their civic orientations. Research suggests that civic orientations themselves are also related to youth civic participation (Nygård & Jakobsson, 2013; Shah et al., 2005; Theiss-Morse, 1993), but how they interact with other psychological predictors in explaining civic participation remains to be examined, especially when those orientations are less clear to the need or chance to participate.

Civic orientations represent how (young) people perceive citizenship and the role of citizens in politics (Dalton, 2008; 2009; Ohme, 2018), and thus might also contribute to the expression of cognitive-affective evaluations of politics. Ohme (2018) proposed four distinct orientations (dutiful, optional, individual, collective). They align along two independent "continuums", one pertaining to the obligation to participate (vs. the optionality of it) and the other to the individual agency (vs. the need to work as part of a collective to achieve one's own civic goals).

In this paper, we explored how civic orientations might influence the relationship of the established psychological predictors (see Barret & Pachi, 2019 for a review) – political interest, satisfaction with democracy, and political self-efficacy – with participation. Specifically, we examined two possible mechanisms: First, we proposed that psychological features contribute to civic participation through the formation of civic orientations in youth (or, at least, influence them), suggesting a mediational model of the relationship between psychological features and participation (H1). Then, we considered civic orientations as preformed positions unrelated to psychological features, and (H2) hypothesized that they influence (moderate) the relationship between the psychological antecedents and participation (e.g., if individuals feel obliged to participate, they would be more likely to do so, irrespective of their interest, self-efficacy, or satisfaction).

Method

Participants

With a broader survey, we collected responses from 498 participants, but retained 375 of them who responded to the items used in current analyses. They were between 18 and 29 years of age ($M = 22.1$, $SD = 4.1$), roughly equally distributed between male (46%) and female (53%), with three participants stating their gender as non-binary. Most of the participants were university students (84%). At the time of data collection, they were spending up to 300 hours ($M = 7.9$, $SD = 20.6$, highly skewed towards lower values) per month engaging in on average 8.5 different civic and political activities ($SD = 5.7$).

Procedure

The data was collected as part of a larger study on citizenship. The survey was conducted online (hosted on 1ka.si); the link was shared on social media (student groups), through mailing lists, and using a snowball technique initiated by a group of psychology students.

Measures

Civic orientations were measured using 4 items proposed by Ohme (2018): *It is a civic duty to know what is going on in politics and society* (dutiful orientation), *Everyone is free to not engage in political or societal activities* (optional orientation), *Even as a single person one can change something in society and politics* (individual orientation), and *Only as a member of a group one can change something in society and politics* (collective orientation). The participants rated their agreement with items along a 7-point scale. In line with theoretical expectations (Ohme, 2018), the items were relatively independent from each other (rs = .05–.25).

Psychological predictors of participation (political interest, satisfaction with democracy, political self-efficacy) were measured using 3 items rated along a 7-point scale (1 – *strongly disagree*, 7 – *strongly agree*). The items were selected by Connolly et al. (2019) from various papers on citizenship that address similar constructs.

Civic and political participation was assessed using a list of 22 activities (both online and offline; see Lep & Zupančič, 2021). For each of the activities, participants indicated how often they engaged in it in the past using a 7-point rating scale (1 – *never*, 7 – *very often*).

Results

Civic orientations as mediators

The mediating role of civic orientations in predicting participants' civic participation using the psychological predictors was tested within a single SEM model to control for the shared variance between the variables. The results presented in Figure 1 are separated by orientation for comprehensibility.

The model explained a notable share of variance in participation (R^2 = .21). Individual civic orientation mediated the relationship between both political interest and satisfaction with democracy, and participation, but not the relationship between political self-efficacy and participation. The other three orientations did not mediate the relationships between psychological predictors and participation. However, optional orientation contributed to lower participation and political interest was predictive of higher dutiful orientation.

Civic orientations as moderators

In testing the moderated relationship between the psychological predictors and participation, higher dutiful orientation (R^2 = .19) strengthened the relationship between political interest and participation (b_{+1SD} = 4.31, $p < .001$ vs. b_{-1SD} = -0.42, p = .64) and encouraged participation at low political self-efficacy (b_{+1SD} = 1.57, p = .016 vs. b_{-1SD} = 2.51, p = .02).

On the other hand, higher optional orientation (R^2 = .18) canceled out the predictive power of political self-efficacy in
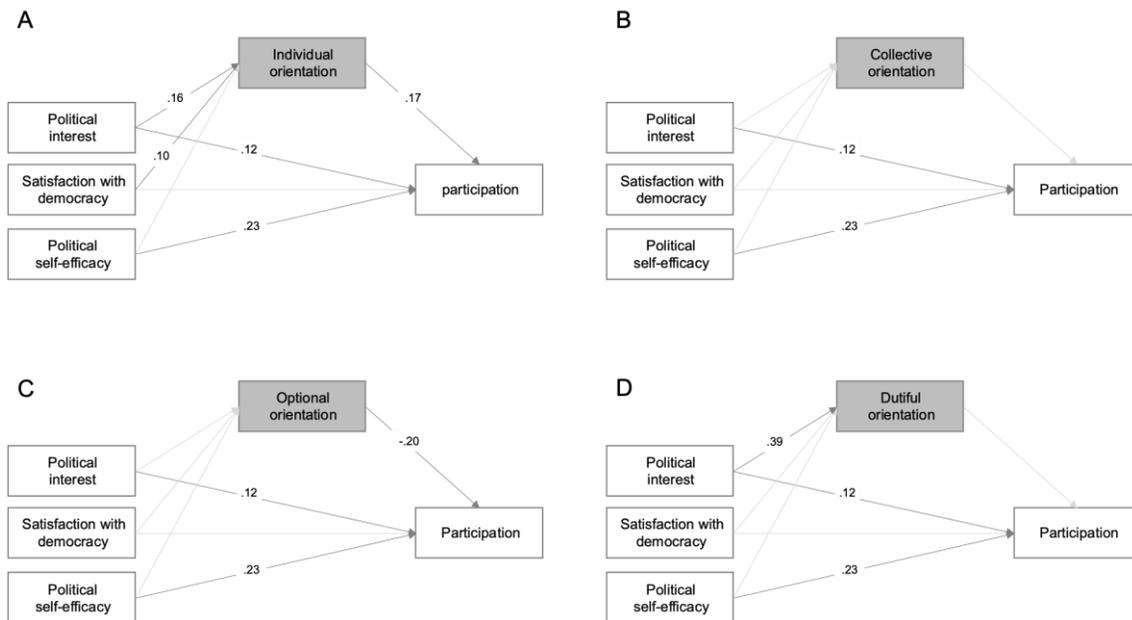
Figure 1: Results of a model testing the mediating role of individual (A), collective (B), optional (C) and dutiful (D) civic orientation in the relationship between psychological predictors of civic participation and participation. All parameters were estimated within a single model but are presented separately for comprehensibility. Only coefficients, significant at $p < .05$ are reported and insignificant paths are presented in grey.

predicting participation ($b_{+1SD} = 1.13$, $p = .30$ vs. $b_{-1SD} = 5.25$, $p < .001$) and hindered participation at low political interest ($b_{+1SD} = 2.99$, $p < .001$ vs. $b_{-1SD} = 0.20$, $p = .87$). No moderation was found for either individual or collective orientations ($R^2 = .16$).

Discussion

This study contrasted two competing mechanisms through which civic orientations – the ways young people perceive civic and political participation – could contribute to their actual behaviour. The results suggest that these mechanisms do not operate uniformly, and contrary to expectations, not all four orientations contribute to participation.

Taken together, there is some evidence that political interest and satisfaction with democracy improve individual's agency, which, in turn, promotes participation, suggesting a mediated path through the individual orientation as proposed by our first hypothesis. To an extent, such results explain how individuals with similar levels of political interest or trust in democracy might participate to varying degree based on their perceptions of citizenship.

On the contrary, the beliefs about the need to participate (optional orientation) are independent of psychological predictors but affect the participation in their own right. In both the mediated and moderated model, the optional orientation contributed to youth participation, which suggests tapping into this orientation could be beneficial in spurring youth civic participation regardless of their evaluations of politics. Thus, the role of civic orientations seems to go beyond providing a frame within which the existing evaluations of politics are translated into participation. Still, the results indicate there is little gain in changing the orientations if youth are disengaged (exhibit low interest, satisfaction, and self-efficacy), as psychological antecedents of behaviour were better predictors of participation.

In interpreting the results, we must note that the single-item measures of psychological predictors provide only crude assessments and introduce measurement error. In further studies, more nuanced measures should be used, preferably in a combination with a cross-lagged or longitudinal study design as the cross-sectional design of the present study offers no information about change in the levels of constructs. Such approach would offer better insight into how civic orientations are formed and how they relate to other relevant constructs, for example civic identity, which is related to both psychological predictors of civic participation and participation itself (Lep & Zupančič, 2022). Still, our preliminary results might be useful in further exploration and modelling of the role of civic orientations in youth civic participation.

Acknowledgments

References

Amnå, E., & Ekman, J. (2014). Standby citizens: Diverse faces of political passivity. *European Political Science Review*, *6*(2), 261–281. https://doi.org/10.1017/S175577391300009X

Barrett, M. in Pachi, D. (2019). *Youth civic and political engagement*. Routledge.

Barrett, M. & Zani, B. (Eds.). (2015). *Political and civic engagement: Multidisciplinary perspectives*. Routledge.

Connolly, R., Miller, J., & Smart, W. (2019). *Amended Digital Citizenship Scale* [Unpublished research proposal].

Dalton, R. J. (2008). Citizenship norms and the expansion of political participation. *Political Studies*, *56*(1), 76–98. https://doi.org/10.1111/j.1467-9248.2007.00718.x

Dalton, R. J. (2009). *The good citizen: How a younger generation is reshaping American politics*. Sage.

Lep, Ž., & Zupančič, M. (2021). *Electronic Supplementary Material for: "Civic identity in emerging adulthood: Validation of the Civic Identity Status Scale"*. https://doi.org/10.23668/psycharchives.5173

Lep, Ž., & Zupančič, M. (2022). Civic identity in emerging adulthood: Validation of the Civic Identity Status Scale. *European Journal of Psychological Assessment*. Advance online publication. https://doi.org/10.1027/1015-5759/a000696

Nygård, M., & Jakobsson, G. (2013). Political participation of older adults in Scandinavia – the civic voluntarism model revisited? A multi-level analysis of three types of political participation. *International Journal of Ageing and Later Life*, *8*(1), 65–96. https://doi.org/10.3384/ijal.1652-8670.12196

Ohme, J. (2019). Updating citizenship? The effects of digital media use on citizenship understanding and political participation. *Information, Communication & Society*, *22*(13), 1903–1928. https://doi.org/10.1080/1369118X.2018.1469657

Pancer, S. M. (2015). *The psychology of citizenship and civic engagement*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199752126.001.0001

Shah, D. V., Cho, J., Eveland, W. P., & Kwak, N. (2005). Information and expression in a digital age: Modeling internet effects on civic participation. *Communication Research*, *32*(5), 531–565. https://doi.org/10.1177/0093650205279209

Theiss-Morse, E. (1993). Conceptualizations of good citizenship and political participation. *Political Behavior*, *15*(4), 355–380.

Stigma Regarding Menstrual Products and Helping Behaviour:
An Observational Study

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Abstract

Menstruation is a highly stigmatised subject in many societies, resulting in norms regarding menstrual behaviour women are expected to abide by (e.g. hiding periods). The aim of our study was to examine whether menstrual stigma would hinder helping behaviour when a girl drops a menstrual product, thus breaking the norm of menstrual secrecy. A structured observational study was conducted. Data was collected via event sampling: each time the researcher would drop an object (seemingly on accident), the reactions of passers-by were registered. She would drop either a pack of menstrual pads or a pack of cigarettes, which was used as the control situation. A total of 47 events were acted out, with reactions of 70 passers-by coded. We coded the gender of the participants and their helping response (ignoring/pointing out/handing back the object). In helping situations, we coded whether the helper named the object or not. Results show that helping is less likely to occur when pads are dropped, and helpers avoid naming them more than they do with cigarettes. However, in helping situations there was no difference regarding the helping response in two situations, e.i. both objects were equally likely to be handed back or indicated. No gender differences in helping were found. Our study points to the conclusion that menstrual stigma does lead to a differential treatment of menstrual objects, which in turn hinders helping, as well as talking about them openly.

Keywords: menstruation; menstrual stigma; helping behaviour; altruism; observation

Introduction

In many societies, a strong stigma around menstruation is present: the period is a taboo subject, talking of which is especially avoided if men are around. (Uskul, 2004, Wong et al, 2013). The usage of euphemisms when referring to menstruation is widespread and considered a good practice (Bhartiya, 2013; Chang et al, 2009). This stigma results in women feeling the need to hide their menstrual status (Oxley, 1998), which in turn affects the way they handle menstrual products. Women feel like they have to handle menstrual products as discreetly as possible. They keep pads and tampons in inconspicuous places in their home and use different packaging meant for hiding them (Uskul, 2004). Although negative beliefs about menstruation are held by both men and women, many studies show that men have a more negative attitude toward menstruation and menstruating women (Forbes et al, 2003; Wong et al, 2013). Men also more frequently state that menstruation should be kept secret (Marván et al., 2006), while girls will more often disagree with such propositions (Wong et al, 2013). To our knowledge, there were no studies conducted about the effect of stigma regarding menstruation on helping behaviour. The aim of our study was to examine whether menstrual stigma would hinder helping behaviour when a girl drops a menstrual product, thus breaking the norm of menstrual secrecy. We also examined the possibility of gender differences in such helping behaviour.

Method

A structured observational study was conducted, in which one girl was a full participant, and three others were full observers. Data was collected in a shopping mall via event sampling. One girl would drop either a pack of sanitary pads or a pack of cigarettes, while three independent observers coded reactions of passers-by for whom it was evident that they had noticed the dropped object. Coding was done on mobile phones, so as to make it as subtle as possible.. Objects were dropped seemingly by accident, while the girl was taking something else from her bag. She would walk on as if she did not notice what had happened. The pack of sanitary pads was small, brightly coloured and of a locally well-known brand. A pack of cigarettes was chosen as a control object, since it is similar in size and value, but is not

stigmatised in Serbian society. A total of 47 events were acted out, 21 with pads and 26 with cigarettes. Since several people reacted in most situations, the behaviour of 70 passers-by was coded, 40 of whom were women (Table 1).

Table 1: Structure of the sample based on gender and the type of situation

	Cigarettes	Pads	Total
Women	17	23	40
Men	16	14	30
Total	33	37	70

Coding was done using a topographic coding scheme. First we coded the type of situation (pads/cigarettes) and gender of the participants. Then we coded their helping response as follows: ignoring - the participant notices the object but does not do anything about it; pointing out - the participant points out the object to the girl, but does not pick it up; handing back the object - the participant picks up the object and hands it back to the girl. The two latter categories can be grouped together as helping behaviour. In helping situations, we coded whether the helper named the object or not and their signs of discomfort based on their nonverbal communication. Signs of discomfort we coded were nonverbal signs related to negative emotions such as embarrassment, shame and disgust (eg. avoiding eye contact, fidgeting, distancing, etc.) (Costa, 2001; Popadić, 2021; Retziner, 1995). Smiling and making eye contact were coded as signs pointing to a positive attitude (Popadić, 2021). Although it was initially planned to code the reactions only as comfort or discomfort, during the observation it became apparent that some participants displayed no specific nonverbal signs, so we decided to add the category neutral reaction.

Results

Frequencies of different reactions are shown in Table 2. When we group both helping behaviours in one category, results show that the participants helped significantly more often with cigarettes compared to pads ($\chi2 = 10.405$, p< .001). When cigarettes were dropped, they were never ignored. Helping was avoided exclusively when the girl dropped a pack of sanitary pads.

Table 2: Differenes in helping behaviour in the two situations

	Ignoring	Helping	Total
Cigarettes	0	33	33
Pads	10	27	37
Total	10	60	70

Contrary to our expectations, there were no significant differences regarding signs of discomfort in the two situations. As can be seen in Table 3, most participants showed signs of comfort or a neutral attitude while interacting with the girl, regardless of the type of object being dropped (p< .083).

Table 3: Nonverbally displayed comfort/discomfort in the two situations

	Signs of comfort	Signs of discomfort	Neutral	Total
Cigarettes	2	11	20	33
Pads	4	13	8	25
Total	6	24	28	58

In helping situations, participants were significantly less likely to name pads than cigarettes ($\chi2 = 13.556$, p< .001). When referring to the pads they more often used words like "that" or "something". Out of 37 participants that helped the girl when she dropped pads, only two named them, while cigarettes were named by more than half of the helpers (Table 4).

Table 4: Naming the dropped object

	Not naming the object	Naming the object	Total
Cigarettes	19	14	33
Pads	35	2	37
Total	54	16	70

Even though overall participants were more likely to help when cigarettes were dropped, in helping situations the two objects were not treated differently. When we look at the different types of helping behaviour we can see that both objects were equally likely to be handed back or indicated, contrary to our expectations (p< .714) (Table 5).

Table 5: Types of helping behaviour in the two situations

	Pointing out	Handing back	Total
Cigarettes	18	15	33
Pads	16	11	27
Total	34	26	60

Lastly, results show no significant gender differences in helping behaviour (p< .647). Men and women were equally likely to help the girl who dropped pads (Table 6). This finding is inconsistent with previous research pointing to men having more negative attitudes toward menstruation (Forbes et al, 2003; Wong et al, 2013), but we must keep in mind that the number of observations we base our finding on is scarce.

Table 6: Type of reaction based on gender and type of situation

		Ignores	Points out	Hands back	Total
Cigarettes	W	/	9	8	17
	M	/	9	7	16
	Total	/	18	15	33
Pads	W	6	12	5	23
	M	4	4	6	14
	Total	10	16	11	37
Total	W	6	21	13	40
	M	4	13	13	30
	Total	10	34	26	70

Discussion

Our findings show that menstrual stigma does hinder helping behaviour even with a task as easy as the one we used. Our participants were less likely to help a girl who drops sanitary pads compared to when she drops a pack of cigarettes, and also avoided naming sanitary pads when verbally interacting with her. However, the stigma didn't seem to affect the non-verbal behaviour of participants, with no differences present in the signs of discomfort and frequency of handing back the object in the two situations. This could indicate that firmer norms exist regarding *talking* about menstruation, or that the norm of courtesy was prioritised over the normed distance towards menstrual products. Lack of gender differences can be partly explained by the type of helping behaviour expected from participants, which is more often expected from men who are expected to be gallant gentlemen, while women are expected to help mostly by providing emotional support (Aronson et al., 2015).

The limitations of our study are mostly connected to the nature of real time observation. Firstly, nonverbal signs were challenging to code because of the distance and speed of interaction, but also because of their ambiguous nature. Same signs can often represent both comfort and discomfort (e.g. a smile). For this reason the non-verbal communication was coded based on the whole impression the observers and the girl had, rather than by strictly following the coding scheme. Moreover, the number of people who ignored the dropped object could've been underestimated. Some people might not have indicated that they had seen the dropped object in any way the observers could notice (e.g. moving their heads), and thus have not been coded as a participant. Lastly, it must be pointed out that helping behaviour was overall very high. Most participants reacted fast and with no reluctance in both situations. Hence, it would be interesting to investigate helping behaviour in the context of menstrual stigma with a task that is more difficult for participants. But as we have seen, even when the interaction is simple and fast, and the task of helping doesn't carry isn't costly to the participant, menstrual stigma has an effect on helping behaviour.

References

Aronson, E., Wilson, T. D., Akert, R. M., & Sommers, S. R. (2015). *Social Psychology* (9th ed.). Pearson.

Bhartiya, A. (2013). Menstruation, Religion and Society. *International Journal of Social Science and Humanity*. 523–527. EJournal Publishing. https://doi.org/10.7763/ijssh.2013.v3.296

Chang, Y.-T., Hayter, M., & Lin, M.-L. (2011). Pubescent male students' attitudes towards menstruation in Taiwan: implications for reproductive health education and school nursing practice. *Journal of Clinical Nursing. 21*(3–4), 513–521. Wiley. https://doi.org/10.1111/j.1365-2702.2011.03700.x

Costa, M., Dinsbach, W., Manstead, A.S.R. & Bitti, P. E. R. (2001). Social Presence, Embarrassment, and Nonverbal Behavior. *Journal of Nonverbal Behavior 25*(4), 225–240. https://doi.org/10.1023/A:1012544204986

Forbes, G. B., Adams-Curtis, L. E., White, K. B., & Holmgren, K. M. (2003). The role of hostile and benevolent sexism in women's and men's perceptions of the menstruating woman. *Psychology of Women Quarterly*, *27*(1), 58-63.

Marván, Ma. L., Ramírez-esparza, D., Cortés-Iniestra, S., & Chrisler, J. C. (2006). Development of a New Scale to Measure Beliefs about and Attitudes Toward Menstruation (BATM): Data from Mexico and the United States. *Health Care for Women International, 27*(5), 453–473. Informa UK Limited. https://doi.org/10.1080/07399330600629658

Oxley T. (1998). Menstrual Management: An Exploratory Study. *Feminism & Psychology*. 8(2), 185-191. https://doi.org/10.1177/095935359800800205

Popadić, D. (2021.) *Elementi socijalne psihologije.* Beograd: Institut za psihologiju Filozofskog fakulteta u Beogradu.

Uskul, A. K. (2004). Women's menarche stories from a multicultural sample. *Social Science & Medicine*, 59(4), 667–679. Elsevier BV. https://doi.org/10.1016/j.socscimed.2003.11.031

Wong, W. C., Li, M. K., Chan, W. Y. V., Choi, Y. Y., Fong, C. H. S., Lam, K. W. K., Sham, W. C., So, P. P., Wong, K., Yeung, K. H., & Yeung, T. Y. (2013). A cross-sectional study of the beliefs and attitudes towards menstruation of Chinese undergraduate males and females in Hong Kong. *Journal of Clinical Nursing 22*(23–24), 3320–3327). Wiley. https://doi.org/10.1111/jocn.12462

Facebook Reactions to Milena Radulović's Rape Accusation – a Content Analysis of Rape Myths and Victim Support

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Abstract

This study aimed to examine the prevalence of rape myths versus reactions to rape that are supportive of victims in Serbian public discourse. The research focused on reactions to the first social media posts by news outlets reporting a multiple rape charge that actress Milena Radulović filed against her former acting teacher Miroslav Aleksić. Deductive content analysis was conducted in order to analyze the population of six Facebook posts by the five most followed Serbian daily newspapers. Obtained results suggest that non-supportive reactions mainly refer to case-specifics and turn them against the victim, while the most common supportive reactions are those that can be expressed to a distant, unknown person (in this case, a celebrity). Our results are consistent with previous research that indicates that men are more likely to endorse rape myths and show less support for victims than women. Units depicting myths about rape versus those expressing support and defense of the victim were equally prevalent, which implies that rape remains a controversial topic that provokes conflicting opinions.

Keywords: rape myths, rape victims, content analysis.

Introduction

The term rape culture refers to the ideologies and behaviors that normalize rape (Stubbs-Richardson et al., 2018), and includes attitudes that are generally inaccurate, but widespread, that serve to deny or justify male aggression against women (Lonsway & Fitzgerald, 1994, according to: Payne et al., 1999). Previous studies, some of which also used content analysis, documented the existence of a large number of such harmful beliefs (Feild, 1978; Payne et al., 1999; Kosloski et al., 2018; Sacks et al., 2018; Stubbs-Richardson et al., 2018); which, based on the work of Payne and colleagues (1999), we call rape myths. Some of them include denial of the responsibility of the rapist (e.g. because men cannot control their sexual urges), denial of the injury (e.g. the belief that the significance of rape is exaggerated or that

victims can even enjoy rape), or the belief that rape occurs only in deviant parts of society (Payne et al., 1999).

Social networks are an important space for countering myths about rape. One study even documents that reactions to the experience of rape are mostly supportive (Bogen et al., 2021). Unfortunately, data from many other studies indicate that rape culture is still a widespread phenomenon (Kosloski et al., 2018; (Stubbs-Richardson et al., 2018; Stabile et al., 2019). The aim of the current study was to look into the prevalence of different rape myths within Serbian public discourse. Additionally, we wanted to explore the opposing, victim-affirming reactions and look into the types of support expressed to the victims on social networks..

Method

The present research focused on reactions to the first social media posts by news outlets reporting a multiple rape charge that actress Milena Radulović filed against her former acting teacher Miroslav Aleksić, which has drawn significant public attention. Deductive content analysis was conducted in order to analyze the sample of comments from six Facebook posts by the five most followed Serbian daily newspapers (*Blic*, *Kurir*, *Telegraf*, *Alo*, *Večernje Novosti*). Considering the popularity of these newspapers, we can claim that this can be generalized to a wider population of Facebook comments on media posts. All the newspaper articles (linked in the sampled Facebook posts) were the first published about this topic by the given newspaper outlets, and they contained basic information about the rapist, the victim and her accusation. The units of analysis were themes covered in the comments to said posts. A total of 676 comments from these posts were included in the analysis, and they made for 729 units of analysis (since lengthy comments usually covered more than one theme). The coding scheme was used in an exhaustive and exclusive manner.

Coding scheme

The categories of the coding scheme were constructed based on a review of the literature on rape myths and supportive responses to rape. Seven categories were defined based on the seven dimensions of the Illinois Rape Myth Acceptance Scale from the study by Payne and colleagues (1999). In addition to the categories from this scale, we added two categories referring to the punishment of rapists: *rapist's life would be ruined by punishment* (Kosloski et al., 2018) and the opposite category - calling for *severe punishment of the rapist* (Feild, 1978). Since the victim in the case the posts refer to is a celebrity, another category was added: *the victim directly benefits from the rape (accusation)*, due to increased publicity. Our first hypothesis refers to the fact that among the myths about rape, the most prevalent will be those that refer to the specifics of the case itself, turning them against the victim (eg. category dismissing rape because accusation happened late is to be expected in the case that has been examend in this study). When it comes to forms of support, we based our categories on spouse support behaviors (Cutrona & Suhr, 1992), as adapted for another study focused on supportive reactions to rape on Reddit (Andalibi, 2018). These categories refer to different forms of support (affirmation of victim, emotional, informational, instrumental, and network support). Our hypothesis was that among the supportive reactions, those that can be provided when the victim is an unknown, distant person will be the most prevalent (e.g. expressing emotional support, affirming the victim's point of view). Initially we defined category Other for those units that didn't fit into any of the categories of the deductive coding scheme. Since one quarter of units were categorized as Other, we decided to conduct a post hoc inductive analysis of this category. It resulted in formation of two subcategories: Generally supportive and Generally unsupportive reactions. We hypothesized that, overall, comments endorsing rape myths will be more prevalent than responses supportive of the victim. This is based on the results of previos studies that indicate the great representation of rape culture in online space (Stabile et al., 2019; Stubbs-Richardson et al., 2018). We also recorded the gender of the commenter based on their Facebook name (1=female, 2=male, 3=other). Given the finding that men, on average, score higher on the Illinois Rape Myth Acceptance Scale (Payne et al. 1999), we expected that rape myths will be more often be endorsed in units written by men than those written by women.

Results

We used frequency analysis to determine the prevalence of units that reflect rape myths as well as those that express victim support. The results indicate that most frequently endorsed. rape myths are the ones connected to the specifics of the Aleksić case (Table 1). Therefore, the victim was most often attacked based on the fact she didn't immediately report the rape (37.75% of rape myth comments), or based on the idea that she profits from the rape accusation (20%).

Table 1: Representation of units related to rape myths.

Rape myths	f	%
Dismissing rape because accusation happened late	111	37.75
The victim profits from rape	59	20.07
The victim lied	36	12.24
Denying that what happened counts as rape	30	10.20
The victim wanted to be raped	25	8.50
Rape is a trivial event	12	4.08
The punishment would ruin the rapist's life	8	2.72
She asked for it	6	2.04
Denying rapist of responsibility	5	1.70
Rape is a deviant event	2	0.68
Total	294	100.00

Within supportive reactions (Table 2), the category *Calling for strict punishment of rapists* is the most frequent, though indirect form of support (62.34% of all supportive reactions). We draw attention to two post-hoc extracted subcategories that emerged: *Call to Justice* (26%) in which commenters called for the persecutor to be duly punished by law, and *Aggression towards the aggressor* (36%) - emotionally charged, graphic comments calling for extreme, often physical punishments for the rapist, and even the death penalty.

The chi-square test showed units related to rape myths were more often authored by men ($\chi 2 = 27.757$, p < .01), while supportive units were more often written by women ($\chi 2 = 5.492$, p < .05). This result is consistent with previous research and confirms our hypothesis.

Table 2: Representation of victim-supportive reactions.

Victim-supportive reactions	f	%
Calling for punishment of the perpetrator	149	62.34
Aggression towards the aggressor	87	36.40
Call to justice	62	25.94
Emotional support	43	17.99
Victim affirmation	40	16.74
Informational support	5	2.09
Instrumental support	2	0.84
Network support	0	0
Total	239	100.00

Comments depicting rape myths were slightly more common than those providing some form of support (294 versus 239 units of analysis). Even though a post-hoc analysis of the comments initially labeled as *Other* shows a greater number of supportive (341) units versus non-supportive (329) ones, this difference is not statistically significant ($\chi 2 = 5.675$, p = 0.643).

Table 3: Gender differences.

	Rape myths	Supportive reactions
Men	184	100
Women	96	136
χ^2	27.657**	5.492*

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

Discussion

As expected, the specifics of the rape case in question were used to discredit the: the victim is accused of profiting from rape, the rape is denied because of its recurrence and, most importantly, because it wasn't immediately reported. We can conclude that rape myths explored here, all previously documented, are used as a framework for interpreting individual cases of rape. Victims who come forward with accusations of rape can expect that the details of the trauma they went through will be used against them, and the ways to discredit the victims are somewhat predictable and established.

Our study documented a significant prevalence of indirect support for the victim, such as attacking the aggressor or expressing disappointment with other commenters and society due to the absence of empathy for the victim – something our coding scheme did not originally involve.

It would be interesting to take into account the political positioning of the news outlets – information which wasn't available to us. We also suggest comparing our findings with cases that drew public attention, but which do not involve public figures who hold a special status.

Authors of earlier studies (Stubbs-Richardson et al., 2018) have established that social networks are a significant space for public debate about rape, which proved itself a controversial topic in this study as well. Our results show that rape provokes conflicting opinions, and public condemnation is aimed at both parties – the rapist and, unfortunately, the victims too.

Given the fact that rape myths have been present in a great number of comments, knowing to identify them could greatly benefit people who voice their support for the victim. Also, knowledge about these myths can help newspaper writers to avoid framing their reports in such a way that promotes these myths further.

References

Andalibi, N., Haimson, O. L., Choudhury, M. D., & Forte, A. (2018). Social Support, Reciprocity, and Anonymity in Responses to Sexual Abuse Disclosures on Social Media. *ACM Transactions on Computer-Human Interaction 25*(5), 1–35. Association for Computing Machinery (ACM). https://doi.org/10.1145/3234942

Bogen, K. W., Bleiweiss, K. K., Leach, N. R., & Orchowski, L. M. (2021). # MeToo: Disclosure and response to sexual victimization on Twitter. *Journal of interpersonal violence*, *36*(17-18), 8257-8288.

Cutrona, C. E., & Suhr, J. A. (1992). Controllability of stressful events and satisfaction with spouse support behaviors. *Communication research*, *19*(2), 154-174.

Feild, H. S. (1978). Attitudes toward rape: A comparative analysis of police, rapists, crisis counselors, and citizens. *Journal of Personality and Social Psychology,* 36, 156–179.

Payne, D. L., Lonsway, K. A., & Fitzgerald, L. F. (1999). Rape myth acceptance: Exploration of its structure and its measurement using theIllinois rape myth acceptance scale. *Journal of Research in Personality*, *33*(1), 27-68.

Sacks, M., Ackerman, A. R., & Shlosberg, A. (2018). Rape myths in the media: A content analysis of local newspaper reporting in the United States. *Deviant Behavior*, *39*(9), 1237-1246.

Stabile, B., Grant, A., Purohit, H., & Rama, M. (2019). "She Lied": Social construction, rape myth prevalence in social media, and sexual assault policy. *Sexuality, Gender & Policy* *2*(2), 80–96. Wiley. https://doi.org/10.1002/sgp2.12011

Stubbs-Richardson, M., Rader, N. E., & Cosby, A. G. (2018). Tweeting rape culture: Examining portrayals of victim blaming in discussions of sexual assault cases on Twitter. *Feminism & Psychology*, *28*(1), 90-108.

Public Reactions to Rape in the Case of Daniela Steinfeld - the Reinforcement of Rape Myths

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Abstract

This paper aims to provide a content analysis of public reactions to rape allegations in the case of Daniela Steinfeld present in the Facebook comments with special regard to the content of the comments that express the negative reactions, the role of the accused's popularity and the commentator's gender in expressing the negative reactions in the comments. The variables that were used for coding were: the gender of the commenter, the quality of the comment related to the victim, justification of the accused and quality of the unsupportive comment related to the victim. Although supportive comments were also present, they were not analyzed in this study. The results confirmed three out of four hypotheses: unsupportive comments towards victim were more frequent than supportive, unsupportive comments were more frequent among males than females, and the main theme of unsupportive comments was mostly the assumption that the victim lied and manipulated. Contrary to the fourth hypothesis, it was shown that popularity was not used to justify the accused rapist. We discuss methodological aspects of the study, possible theoretical explanations of our findings and the practical implications of the study.

Keywords: public reactions, rape, gender, just world hypothesis, content analysis

Introduction

The Steinfeld case refers to the accusation that actress Daniela Steinfeld made against her senior colleague Branislav Lečić in March 2021, accusing him of raping her in 2012.

Rape is a form of sexual violence that is defined as physical or in any other way forced penetration – even slight – of the vulva or anus by the penis, other parts of the body or an object (WHO, 2002). Although it occurs all over the world (WHO, 2002), this topic is little talked about. Generalized and widely accepted beliefs about rape that serve to trivialize rape or suggest that rape did not happen are called rape myths (Franiuk, et al., 2008). A possible explanation for the viability of myths about rape is the belief in a just world, i.e. the tendency of people to believe that bad things happen to bad people, that is, that they do not happen to good people, and that people get what they deserve in life (Lerner, 1980 according to Kraljević, 2013).

Considering all the above, this research aims to examine public reactions to sexual abuse that are present in Facebook comments.

The first hypothesis is that the proportion of comments that are unsupportive of the victim will be larger than the proportion of those that are supportive. It was found that a significant share of the population supports myths about rape (Lonsway & Fitzgerald, 1994), an important share of which are precisely the myths related to the victim - eg. that she is lying, that she asked for it herself, that it only happens to a certain type of woman, that she changed the story, etc. (Burt, 1980 according to Franiuk, et al., 2008).

The second hypothesis is that men are more likely to write comments that are unsupportive towards the victim than women. This is in line with findings that men are more likely to endorse rape myths than women (Amar, et al., 2014; Lonsway & Fitzgerald, 1994; Slavikovski, 2018).

The third hypothesis is that in the unsupportive comments towards the victim, the largest share will be those who emphasize that the victim is lying that the rape happened. This is in accordance with the finding that the most frequently mentioned myth in media reports about rape is that the victim is lying (Franiuk, et al., 2008).

Lastly, we expected that in the comments that are supportive towards the accused, there will be more people who emphasize his fame than those who do not (using it to justify supporting him). This hypothesis is supported by the finding that people tend to trust the statements of the accused of sexual violence more than the victim when the accused is a celebrity than when he is not (Knight, et al., 2001).

Method

The material we used in order to examine our hypotheses are the comments below the post on the Facebook page of the daily newspaper "Blic" in which Daniela Steinfeld revealed

the identity of her rapist. We chose this newspaper because its' Facebook page had more likes than any other newspaper's Facebook page that publishes current news in Serbia. The unit of analysis was the theme of an individual direct comment (those not in response to another's comment, as we wanted to avoid repeating the main topic found in the primary comment). The sampling process started with finding the post from March 22, 2021, when Daniela revealed that the man she was accusing was Branislav Lečić. The post had the highest number of direct comments that we could analyze. We wanted to examine people's initial opinion at the moment they learned that a sexual assault accused is a celebrity, even though they had no additional information supporting or opposing it.

In the sampling process, from a total of 602 comments under the post, every other direct comment was selected starting from the first, that is, oldest one until the number of 300 comments was reached. The rationale for reducing the number of comments was the time limitation for conducting the study and the efficiency of the analysis. The final sample included 299 units of analysis, where 1 was dropped from the analysis, as it was not relevant for testing our hypotheses. Coding was done by two independent coders and overlap was complete.

The variables that were used for coding were: gender of the commenter (male, female, other), the quality of the comment related to the victim (supportive comment, unsupportive comment, comment that is not related to the victim), justification of the accused (the popularity of the accused is emphasized, the popularity of the accused is not emphasized, the comment is not related to the popularity of the accused), unsupportive comments related to the victim. Seven different categories were defined based on the most frequent unsupportive comments in the previous research (Franiuk et al., 2008, Zaleski et al., 2016). Examples of supportive and unsupportive comments are provided in Table 1. Exact categories of unsupportive comments and respective examples are provided within Table 2.

Table 1: Supportive and unsupportive comments

Comments	Example
Supportive	*Just report them! Enough silence and asking yourself what others, who live in the 16th century, will say - you should not be interested in that! Maniacs, pedophiles, rapists introduce the law of medical castration! Animals know how to behave better than someone called "men". Support to all the victims of violence!*
Unsupportive	*All the girls gave consent, they are putting shame on themselves in this way... Why*

didn't she report him right away? How many years ago did this happen?

Table 2: Unsupportive comments.

Categories of unsupportive comments	Example
She was asking for it	*If you hadn't given him a reason, he wouldn't have…*
Emphasizing the victim's characteristics	*Can you see the face of this alleged rape victim? Only fools can believe her… I wouldn't fuck her because she is repulsive.*
Lack of resistance	*And you've let him do it…*
It's trivial	*Oh come on! Like you were in a lot of pain…*
Giving instructions to the victim	*Dear girl, if it's a rape, you do it right away - you go to the hospital to have evidence, you go to the police, and then file a lawsuit and publicly accuse him. You don't wait a single hour!*
Humor	*Haven't seen a smaller country but more fuckers in a long time!*
The victim is lying and manipulating for the benefit	*While she was building a career it was called sex and now it's called rape…*

Results

The results confirmed three out of four hypotheses: unsupportive comments towards victim (86.29%) were more frequent than supporting (x2 = 130.645, df = 1, p < .001), unsupportive comments were more frequent among males (67.76%) than females (x2 = 18.406, df = 1, p < .001) and the main theme of unsupportive comments was mostly assumption that victim lied and manipulated (43.14%) (x2 = 305.876; df = 7; p < .001). Contrary to the fourth hypothesis, it was shown that popularity was not used to justify the accused rapist (x2 = 1.190; df = 1; p > .05).

Discussion

In accordance with our first hypothesis, it turned out that there were significantly more comments expressing a negative attitude towards the victim than those expressing a positive one. A possible explanation for this result is the belief in a just world. In a previous study (Stromwall et al., 2013), it was shown that people with a stronger belief in a just world attributed more blame to the rape victim. With the methodology we used, we cannot determine the degree of expression of faith in a just world among people whose comments were taken into analysis, but we can assume that

this phenomenon is hidden behind this distribution of positive and negative comments.

An alternative explanation for the obtained result could be the phenomenon called negativity bias, the tendency people to give more importance to negative stimuli than to positive ones. Given that negative comments attract more attention, we can assume that because of this, people who have a negative opinion (in this case about the victim) have a greater need to express this attitude compared to people whose opinion is positive. Therefore, the obtained result would be a consequence of this tendency and not the actual difference in prevalence between positive and negative attitudes.

Also, it is important to point out the practical implications of our findings. Namely, victims of sexual violence, through talking about the evil that was inflicted on them, experience retraumatization, which is made even more unpleasant by the invalidation of their experience by the environment. The fact that the largest number of comments are made by those who express mistrust towards the victim and accuse her of lying can discourage those victims who have not yet spoken about their trauma from doing so, thus further silencing the victims and making it impossible to further fight against such terrible crime.

References

Amar, A. F., Sutherland, M., & Laughon, K. (2014). Gender differences in attitudes and beliefs associated with bystander behavior and sexual assault. *Journal of forensic nursing*, *10*(2), 84-91. https://doi.org/10.1097/jfn.0000000000000024

Franiuk, R., Seefelt, J. L., Cepress, S. L., & Vandello, J. A. (2008). Prevalence and effects of rape myths in print journalism: The Kobe Bryant case. *Violence against women*, *14*(3), 287-309. https://doi.org/10.1177/1077801207313971

Kraljević, J. (2013). *Stav o silovanju i podržavanje mitova o silovanju* (Doctoral dissertation, Josip Juraj Strossmayer University of Osijek. Faculty of Humanities and Social Sciences. Department of Psychology).

Knight, J. L., Giuliano, T. A., & Sanchez-Ross, M. G. (2001). Famous or infamous? The influence of celebrity status and race on perceptions of responsibility for rape. *Basic and Applied Social Psychology*, *23*(3), 183-190.

Lonsway, K. A., & Fitzgerald, L. F. (1994). Rape myths. In review. *Psychology of women quarterly*, *18*(2), 133-164. https://doi.org/10.1111/j.1471-6402.1994.tb00448.x

Slavikovski, L. (2018). *Znanja, iskustva i stavovi studenata/ica relevantnih fakulteta o seksualnom nasilju* (Doctoral dissertation, University of Zagreb. Department of Croatian Studies. Division of Psychology).

Smith, R. E., Keating, J. P., Hesler, R. K. & Mitchell, H. E. (1976). Role and justice considerations in the attribution of responsibility. *Journal of Research in Personality*, 10, 346-357.

Strömwall, L. A., Alfredsson, H., & Landström, S. (2013). Blame attributions and rape: Effects of belief in a just world and relationship level. *Legal and Criminological Psychology*, *18*(2), 254-261. https://doi.org/10.1111/j.2044-8333.2012.02044.x

Zaleski, K. L., Gundersen, K. K., Baes, J., Estupinian, E., & Vergara, A. (2016). Exploring rape culture in social media forums. *Computers in Human Behavior*, *63*, 922-927. https://doi.org/10.1016/j.chb.2016.06.036

EDUCATION SYMPOSIA

TEACHERS IN FOCUS – FROM IDENTITIES TO PRACTICES

Teachers are one of the most relevant school related factors that contribute to students' achievement. They are typically considered agents of change in educational systems and therefore required to constantly innovate their practice, particularly in areas of inclusive education and usage of digital technologies. However, in many countries there is a gap between these requirements and status of the teaching profession and many systems are facing "negative" selection and teacher shortages. Therefore, if we want to improve educational systems there remains the need to understand pre-service and in-service teachers' beliefs, motivation, values and practices. This symposium strives to answer the core questions about teachers, such as their motivation for the teaching profession, professional identities and values, as well as to discuss teachers' experience with digital tools – in the contexts of their own professional inquiry and work with children with disabilities. Five papers within the symposium, although applying different methodologies and relying on different theoretical models, have the joint aim to contribute to well established psychological and pedagogical theories and models and to provide recommendations for the improvement of educational practice.

Professional Identity Development Narratives of Class and Subject Teachers

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Abstract

This paper examines professional development narratives of in-service subject and class teachers in central Serbia. The sample consisted of 72 participants (35 class teachers and 37 subject teachers). Data were obtained by autobiographical oral narrative through an interview about how a person became a teacher, how they changed over time and how she/he sees themselves in the near future. The main techniques for the analysis were thematic analysis and narrative analysis, using MaxQDA data analysis software (version 10). The results show that while working in school was a desirable professional outcome for beginner class teachers, for the majority of subject teachers working as a school teacher represents a professional outcome they did not strive for. Respondents' narratives indicate that the speed and availability of longer-term employment in school after initial education significantly affect the development of their professional identity. It can be concluded that even though becoming a teacher was not an initially desirable professional outcome for the majority of class teachers, over time they have developed professional identity narratives of them being committed and proactive teachers, while for class teachers the biggest obstacle for professional identity formation is possibility and stability of employment as full-time teacher.

Keywords: teachers' professional identity; class and subject teachers; narrative positioning

Introduction

Previous Research on Teachers' Professional identity

Professional identity was identified as an emerging research area at the beginning of the 2000s (Beijaard, Meijer and Verloop, 2004). Since then diverse research on professional identity in the teaching profession have been conducted. Previous research on the professional identity of teachers in the last two decades has determined a trend of increasing and differentiating empirical research on teacher identity with the qualitative methodology being dominant and pre-service teachers being the most researched population in the professional development continuum (Beijaard et al., 2004; Stojkovic, 2021). Some of the main features of this research field are: (a) empirical papers are dominant, while there are less meta-analysis and theoretical papers; (b) qualitative methodology is dominant in empirical research on teachers professional development, quantitative and mix method research is present to a significantly smaller extent; (c) small sample size is present (n ≤ 10 in more than half of qualitative papers); (d) semi-structured interview is the most frequently used data collection technique, alongside questionnaires, observation, reflexive essays and journals; (e) pre-service teachers are the most researched sub-population in the professional development continuum;

(f) the main research topics are formation and identity development of teachers, teacher identity narratives, teachers' identity characteristics (different psychological characteristics of teachers and various socio-demographic characteristics of teachers and environment) and professional identity development in specific study fields (language teachers, music teachers, university teachers etc.).

Research that dealt with the analysis of studies on teacher identity has shown that a clear definition is often lacking in the scientific literature on professional identity (Beijaard et al., 2004; Beauchamp & Thomas, 2009). In defining professional identity there are certain difficulties with different concepts being used to indicate the same thing, especially when it comes to the concepts of 'self' and 'identity' and the ambiguous relationship between the two (Beijaard et al., 2004). The professional identity of teachers could be defined as social identity based on identification with a professional group (Stojnov, 1999), i.e. the response to the question *who am I as a member of the teaching profession?* Apart from basic professional competencies that teachers need to possess and based on which they should act, it is emphasized that the professional teacher's identity is made up of emotions, values and a sense of belonging (Timoštštuk & Ugaste, 2010). It is further emphasized that the professional identity is constantly changing and developing through the interaction with certain times, places and society/societies (Gur, 2013). In this paper, the definition of professional identity in the teaching profession is defined as an organized set of experiences that a person has about himself/herself as a teacher, which consists of multiple self-positions, connected through different social interactions and contexts, and which results in a relatively consistent experience of self in the context of the profession (Akkerman & Meijer, 2011; Opačić, 1995).

Narratives in Teachers' Identity Research

Narratives integrate experiences, beliefs, values and actions into sequences of meanings that are in certain time order (Søreide, 2007). The assumption is that the story is a reflection of the identity of the "narrator" in a given context: that through the stories of teachers we can learn a lot about how they experience different aspects of their professional roles and thus "discover" their professional identities (Schatz-Oppenheimer & Dvir, 2014). The continuity of identity is maintained through narratives about ourselves, which take place within ourselves, as well as through a verbal exchange with others (Hermans & Hermans-Jansen, 1995).

Narratives in teachers' identity research are mostly represented as individual narratives and processes of individual construction, where autobiographical memories

and stories of teachers are the basic material for analysis (Schatz-Oppenheimer & Dvir, 2014; Pinnagar, Mangelson, Reed & Groves, 2011; Estola, 2003; Eisenschmidt, Kasesalu, Löfström & Anspal, 2009). Another use of narratives in teachers' identity research is to explore how public narratives and discourses contribute to the creation of teacher identities (Søreide, 2007).

Method

This paper examines professional development narratives of in-service subject and class teachers in central Serbia. The sample consisted of 72 participants (35 class teachers and 37 subject teachers, 85% females, 27% in the 25-30 age group, 35% are 31-40 years old, 15% are 41-50 years old and 21% are in the 51-60 age group). The class teachers sub-group consisted of mathematics and Serbian language teachers (the criterion for that choice was the number of teaching hours that math and Serbian language teachers have in elementary schools in Serbia, both with 4 hours per week).

Data were obtained by semi-structured interviews using autobiographical oral narratives about how a person became a teacher, how they have changed over time and how she/he sees themselves in the near future. In the narrative approach, it is recommended that the questions should be structured in such a way as to encourage reflection and recall of critical events. To obtain this, the connection of *experience and time* is key, since the narrative is essentially time-determined (Webster & Mertova, 2007). In order to enable gradual guidance through the experiences in different I-positions over time, some basic significant "points" of the autobiographical professional narratives were covered with all respondents: (a) when and how the person "entered" the teaching profession (motivation and reasons for choosing the teaching profession); (b) significant experiences during studies; (c) first work experiences in teaching; (d) perspective for the future (next 5-10 years).

The above mentioned topics are basically following the chronological order of the narration and serve as a guide for the interviewer. Transcripts were made and the main techniques for the analysis were thematic analysis and narrative analysis, using MaxQDA data analysis software (version 10).

Results and Discussion

The results are presented in chronological order of phases of professional development, even though the interview did not follow the chronological order with each participant. The results presented in this paper include main themes, main narrative plots and some exemplary original excerpts from the participants' answers.

Choosing a (teaching) profession

Thematic analysis of the answers about the reasons for choosing a teaching profession (choosing a faculty) resulted in ten basic categories. The distribution of the frequency of responses in the obtained categories and their subcategories, arranged from the most to the least cited, is shown in Table 1.

Table 1: Reasons for choosing a faculty

Code II	Code I	Ct	St	Σ f
Love for ...	Literature	/	13	
	Children	9	/	25
	Taking care of kids			
	Mathematics	/	3	
Teachers' influence	My subject teacher	/	14	24
	My class teacher	9	1	
Family influence	My parents	8	4	15
	Older siblings	1	2	
Education as a value	„always school"	9	5	14
Not too difficult	„I'll finish it easily"	5	8	13
Teaching others	Wanting to teach someone	/	7	13
	Experience in teaching peers	1	5	
Second choice		7	3	10
Influencing young	Age of children and their development influence possibility	8	0	8
Success in mathematics	Talented for/very good at...	/	8	8
Other	Little bit of everything	5	1	6
	Safe job	1	1	2
	Creative job	2	/	2

Ct - Class teachers
St - Subject teachers

For class teachers, the most frequently cited reasons for choosing their profession are related to caring for children and loving them (enjoying contact with children), the influence of their parents (more direct influence on the decision) and their teachers (more indirect influence, by representing a model of behavior), the experience of working in education which is perceived as something special and worth striving for, as well as the age of the students (the possibility of having a significant influence on their development, as well as the belief that they will be "easier to deal with"). In addition to the above, the respondents mentioned some other reasons for choosing their profession, which refer to it being the second choice (i.e. redirecting to the teaching profession by abandoning the original aspirations or unsuccessful attempts to pursue another profession) and to the belief that it would not take much effort to complete those studies, as well as provide broad basic knowledge from different fields.

For the subject teachers, the distribution of reasons for choosing a profession depends on whether they are teachers of the Serbian language or mathematics. For the teachers of the Serbian language, love for literature is the most often cited reason for choosing their profession, followed by the influence of their Serbian language teachers, the desire to teach others, and the education as a value.

These findings are in line with a recent survey in our country in which working with youth, impact on students

and teaching someone are cited as significant motivating factors for the selection of the teaching profession (Simić, 2015). The first two categories – the desire to work with young people and influence them – represent the most frequent motivational factors obtained in that research, and the author classifies them as a superior altruistic motivation.

On the other hand, for the teachers of mathematics, the most common reason for the selection is their success in the subject and a certain ease of achieving good results in mathematics (through easy mastery of the material, and good grades in mathematics), and then the influence of their mathematics teachers, the influence of family members (parents and older brothers/sisters), experience in teaching peers mathematics during primary and secondary school ("showing tasks") and, at the very end, emphasizing the love for mathematics. For the teachers of Serbian language, the least frequent answers (category "other") are related to the fact that the choice of studies was their second choice and that it is something in which a person easily achieves good results and which, therefore, would not be difficult to finish. Among mathematics teachers, the least common reasons for choosing a profession are the desire to teach others, being an educator as a value, and mathematics studies being their second choice.

The beginnings of basic plots, i.e. I-positions of identity, are already visible in the initial narratives about choosing a profession. These basic narrative positions are called:

(1) I have always wanted to work with children / work in school (average representation 30%),
(2) I do not know exactly what I would like to do (average representation 59 %)
(3) I did not want that first (average representation 11%).

The first position is manifested in both class teachers and subject teachers through an early expressed view of themselves as someone who will teach others, with an explicit positive evaluation of the teaching profession and minor variations of alternative occupations in which the person sees themselves. Some authors claim that the teaching profession can be seen as "helping" profession because it encompasses complex, multidimensional interaction processes in which professional knowledge is created and used in order to nurture and improve the development of people and society (Hugman, 2005 according to Lopes, Pereira, Marta & Sousa, 2012b). It is pointed out that the "helping" part is, in fact, integrating aspect of professionalism in the teaching profession and a key factor of teachers' identity (Lopes et al., 2012).

The motivation that class teachers and subject teachers with this positioning attribute to themselves, however, is quite different. When looking at the reasons for choosing a profession that appear in this type of narrative, class teachers report on the experience of an educational worker as highly valued in society, important in the life of students, emphasizing the strong influence of their own teachers and their desire to take care of children. On the other hand, the subject teachers point out reasons quite different from the class teachers, but also from each other: while Serbian

language teachers talk about their expressed love for literature, enjoyment of literature and desire to teach others, mathematics teachers (who are the least represented in this type of positioning) report their giftedness in mathematics, success in it and experience in teaching mathematics to their peers.

On the completely opposite "side" is the position called *I didn't want it first.* It implies reporting on a greater number of alternative occupations in which a person sees himself/herself and which he/she considers more desirable, with a more or less pronounced negative perception of the teaching profession or a complete disregard for that profession as an option. The reasons for choosing the teaching profession are dominated by the fact that there was another occupation that the person wanted to pursue, which (most often) did not materialize for various reasons or they tried it, and were not satisfied with it (a smaller number of respondents). This type of positioning is the least represented, and out of ten people who cited such reasons, seven are teachers, two Serbian language teachers and only one mathematics teacher.

Unlike the previous two positions, which are clearly profiled according to the explicitness of the answers with which the respondents express their attitude towards the teaching profession at the moment of choosing their studies, the most represented narratives are neutral on this issue (59%). This heterogeneous group of responses is called *I don't know exactly what I would like* because the respondents share some indecision about their future occupation that was present throughout most of their high school. Furthermore, a larger number of alternative occupations in which a person sees themselves and which he/she considers desirable is also characteristic. The perception of the teaching profession is neither extremely positive nor negative, and predominant reasons are different for class teachers and subject teachers. While the class teachers report on the significant influence of their parents who more or less directly directed them towards the faculty of education, the subject teachers more often cite their subject teachers (Serbian language or mathematics) as the reason for their choice. While the class teachers talk about their love for children and their desire to work with children, the subject teachers report their love for literature and their desire to pass on knowledge to others (Serbian language teachers), i.e. their love for mathematics, good achievements in mathematics and experience of teaching their peers (mathematics teachers) as the main reasons for choosing their studies.

Period of studies and first employments

The results of the narrative analysis show that while working in school was a desirable professional outcome for class teachers, for the majority of subject teachers working in school represents a professional outcome they did not strive for. As the autobiographical professional narrative progresses through the period of study and first work experiences, the narratives of class and subject teachers

differ significantly in that when a first "turning point" occurs, i.e. when seeing themselves as teachers becomes something that they start striving for.

Experiences gained during long internships in schools (especially in 3rd and 4th year of studies) are considered to be an indispensable part of that narrative turn for class teachers and they most often refer to it in their answers. Examples:

At first I was just lost. Not that I didn't think about the faculty as a faculty then, but I didn't think about myself, what I was doing there. It started maybe at the beginning of the second semester, when we had our first internship, but I can't say that at the time I had some special feeling towards the profession. Only in the third and fourth year came the feeling. In fact, from the third year, at the end of the internship, when I went home and said goodbye to the children, they wrote some thank you and congratulations notes to me, one student even brought me some flowers and I started crying. And I don't cry that easily. The relationship I built with them ... And the relationship with the teacher who talked to me, who guided me – I liked the whole relationship I developed with them. (a beginner class teacher)

When I enrolled in college, I expected ... much more. I got that later, in my third and fourth year of studies. But those first and second years had nothing to do with the vocation. (a class teacher with over 25 years of experience)

Honestly, when I was just starting faculty, that first, second year, I don't think I had any great expectations at all, but I was there to finish that college and I was thinking about exams. And - what would happen next, how I would do it, would I get a job - no, I didn't think about it back then. The practice in the fourth year changed things, because it was then that we were completely left to ourselves. (a class teacher with 5-15 years of experience)

This development of professional identity during internships, which is reflected in increased professional commitment, was also confirmed in other research (Zhao & Zhang, 2017).

While the class teachers report significant and transforming experiences during their studies, when it comes to subject teachers this narrative "turn" happens not so much in the period of studying, but later, with work experience and first years of employment.

I loved math and I didn't know what I would like to do. Honestly, I enrolled in that theoretical course hoping that someday I would find a job outside of school somewhere in this country. Some applied mathematics or something, in industry. In the meantime I realized you need to have_a backup_. And that we would probably all end up in school. And then, when I saw that they allowed us to choose elective courses, practices, methodologies, psychology, pedagogy, it was then that I decided, why not, that I literally have another profession_. (a beginner subject teacher of mathematics)

Honestly, while I was studying, I never thought "now, I'm graduating from faculty and I will start working in a school". I absolutely did not imagine that. When I finished the faculty, what could I do? Well, I could be a journalist, I could work as a lecturer, I could work in a company, in the human resources department, and well, I can always be a teacher._ That was exactly the order. Because I am a dynamic person and simply, school has always seemed too monotonous to me, and now I see that it is not so at all. And that's why I like it so much now. But yes, back then, school was at the very end of the list_. Like a safe haven, but the last one. (a beginner subject teacher of language).

Welcome, teacher!

After graduation professional identity positions of class and subject teachers differ: employment at school is not initially a desirable professional outcome for the majority of subject teachers, but they usually have the opportunity to start working as teachers. On the other hand, class teachers are very much ready-to-go after initial education, they feel encouraged by their experiences during the studies, but they encounter employability obstacles. The respondents' narratives about the period after graduation and the first employment indicate that the speed and availability of longer-term employment in school after their initial education significantly affect the development of their professional identity. While for subject teachers the time period from the completion of studies to the first employment averages several months up to a year, for class teachers the period without an employment or short-term replacement employments usually lasts for several years.

The vast majority of class teachers do not find permanent employment in the first few years (82%). The first work engagements as graduate teachers are often very short-lived, often unpaid (through various forms of volunteer work at school) and do not count in the total length of service. At least half of them do the jobs for which they state that they were not sufficiently prepared (undivided school, combined class and extended stay) or for which they did not receive primary education at all (pedagogical assistant, librarian, personal companion, subject teacher). And the period without an employment or short-term replacement employments usually lasts for several years.

Subject teachers experience overall is different when it comes to professional opportunities in schools. The time period from the completion of studies to the first employment averages several months up to a year (only one subject teacher in this sample spent a few years of job searching after graduation). Unpaid jobs and so-called non-professional jobs are almost non-existent. They start their professional engagement usually with longer substitutions in schools (both primary and secondary), and there are also jobs for an indefinite period, as well as jobs outside the school. Subject teachers "wait" less for employment, they are more "mobile" within the education system (primary and various types of secondary schools), and there is a greater offer of jobs, especially for mathematics teachers, both inside and outside the education system.

The prolonged uncertainty due to short-term employments appear as one of the most important topics of the professional identity of the majority of beginner and medium-experienced class teachers and a very small number of subject teachers.

Several years passed. Those were difficult years, extremely difficult, it was extremely hard to find a job in school ... In those few years, money was not so much a problem, but simply ... you went to university for something, you are ready, and there is no work. (a beginner class teacher).

Four years of looking for a job is very difficult period. It is very difficult to bear, it is something that bothers you, something which, in fact, devalues all your efforts. It is very difficult. (a beginner subject teacher of language)

...And afterwards...

The theme of prolonged uncertainty due to short-term employments continues to be an important topic of the professional identity of the majority of medium-experienced class teachers.

> *It looks like this: I will be "checked out" now on June 30, and if they need some replacements there before September, then they will call me. If not, they won't call me. I have no idea at all when I will be working in school next time. I worked for one semester, so I hoped to continue, but I didn't, and then I started again, and then I didn't work again for a month and so on ... I'm collecting that work experience by months and days.* (a class teacher, 7 years of working experience).

Research that established the existence of discrepancies between what the teachers would ideally want to be and what they are asked to be, called it the gap between the ideal Self and the required Self (Kumazawa, 2013) or the development of "two separate identities, ideal and imposed, which are in constant conflict" (Ruohotie-Lyht, 2013, p. 127). For most of the beginner teachers and some of the experienced class teachers in our country that ideal identity is actually the identity of "Teacher with their own class", which means with more permanent employment and the employment they were primarily educated for. In a sharp contrast to it, in the first few years to even a decade and a half, an imposed identity of a "substitute teacher" takes place. Research proved that these differences between ideal and required act as serious demotivating factors if they are too intense (Kumazawa, 2013) or, in our case, if they last for a long time. The previous research has also found that teachers report on the "trauma of anticipation of a phone call", the phase of insecurity, even despair, which often leads to distancing from the society and withdrawing, when the teacher chooses not to visit certain meetings or deliberately does not participate in activities in which certain decisions are made (Correa, Martínez-Arbelaiz & Aberasturi-Apraiz, 2015). In Serbia it is only recently that people have started talking about the problems of temporary and occasional work of teachers in schools (Živković, 2015). It is indicated that instability in the field of employment leads to emotional, social and psychological instability of teachers and points out that part-time teachers are "marginalized individuals, outsiders who survive on the periphery of school culture as paraprofessionals" (Živković, 2015, p. 801). The author further points out that their personal and professional identity of "occasional" teachers is weakened by the lack of real teaching opportunities (they do not have the opportunity to continuously achieve identification as teachers) and by supporting the established image of themselves as "not-real" teachers. The author further points out that this weakening of professional identity is directly related to the decision to leave the teaching profession.

On the other hand, teachers that have relative stability of employment demonstrate the most differentiated professional identity in the period of 5 to 15 years of working experience, which manifests itself through: professional commitment, productivity, enjoyment in work and "expanding" the field of professional influence outside the classroom. When asked about their future perspectives in school, medium-experienced class teachers still express a desire to stay at the same workplace, with secure employment. In addition to this, there is also an aspiration for leadership among teachers, which also appears in both subgroups of subject teachers. For the first time, there are answers from the subject teachers in which they express the desire for everything to remain as it is now, but also the desire to change jobs, by moving from primary to secondary school or work outside the educational system.

As presented in Table 2, job change is less present in the most experienced teachers group with over 25 years of teaching experience and theme of enjoying the work and educational policy topics emerge.

Table 2: Specific spontaneous topics in experienced teachers' narratives

	Teachers with 5-15 years of working experience		Teachers with over 25 years of working experience		∑f	∑i
On replacement	9	/	/		17	10
Job change	5	6	/	2	14	10
Enjoying the work	3	11	8	5	31	22
Educational policy	4	7	7	34	54	24

∑f - Total frequency of occurrence of the topic in all interviews
∑i - Number of participants in whose answers the given topic appears

The most experienced teachers construct their professional identity around: (1) overall positive perceptions of their job and its purpose, but they also (2) stress that their work implies great obligation and responsibility, and that it is (3) a source of frustration due to the unfavorable social status of teachers in our country. Two alternatives that dominate the answers regarding future perspectives in professional development are that everything remains unchanged and retirement.

Conclusion

Based on this empirical research, it can be concluded that even though becoming a teacher was not initially desirable professional outcome for the majority of subject teachers, they develop over time a professional identity narratives of them being committed and proactive teachers, while for class teachers the biggest obstacle for professional identity formation is possibility and stability of employment as full time teacher. Implications of these findings could further be explored in relation to relevant empirical data as well as through a theoretical lens of professional identity development.

For final considerations it is important to stress the limitations of this research. The sample refers to central Serbia, so the conclusions are to be taken with caution in generalization to entire teacher population in Serbia. Moreover, some more research is needed to confirm these paths of professional identity development narratives, since this has been an exploratory research. Subject teachers are also very diverse group of teachers, further research is needed on specific trajectories of professional development of teachers of different disciplines, as well as taking into account difference between elementary and high school teachers.

Finally, when it comes to practical implications, there is a question of how this knowledge on challenges in professional identity development in teaching profession could be used for improving initial teacher education and in-service teachers professional development programs.

Professional identity of teachers as a research field in Serbia could be more fruitful when compared to diverse global research in this field. Multiplication and differentiation of small scale research, while it provides a variety of findings, lacks the analysis of their connections with theoretical models, so a more comprehensive study of the psychological processes of the teacher's professional identity development is more than welcome.

References

Akkerman, S.F. & Meijer, P.C. (2011). A dialogical approach to conceptualizing teacher identity. *Teaching and Teacher Education,* 27 (2), 308–319. https:doi.org/

Beauchamp, C. & Thomas, L. (2009). Understanding teacher identity: an overview of issues in the literature and implications for teacher education. *Cambridge Journal of Education,* 39 (2), 175–189.

Correa, J.M., Martínez-Arbelaiz, A. & Aberasturi-Apraiz, E. (2015). Post-modern reality shock: Beginning teachers as sojourners in communities of practice. *Teaching and Teacher Education*, 48, 66–74.

Eisenschmidt, E., Kasesalu, A., Löfström, E. & Anspal, T. (2009). *I as a teacher* - Catching patterns of professional development in primary school student teachers' stories. TEPE (Teacher Education Policy in Europe) Conference, Umeå, Sweden May 18–20.

Estola, E. (2003). Hope as Work--Student Teachers Constructing Their Narrative Identities. *Scandinavian Journal of Educational Research*, 47 (2), 181-203.

Gur, T. (2013). Basic and developmental characteristics of teachers' professional identity. *International Journal of Academic Research*, 5 (2), 192–196.

Hermans, H. J. M., & Hermans-Jansen, E. (1995). *Self-narratives. The construction of meaning in psychotherapy.* New York/London: The Guilford Press.

Kumazawa, M. (2013). Gaps too large: Four novice EFL teachers' self-concept and motivation. *Teaching and Teacher Education,* 33 (1), 45–55.

Lopes, F., Pereira, A., Marta, M. & Sousa, C. (2012b). Teachers As Helping Professionals And Teacher Educators' Identities: Some Exploratory Data. *ECER 2012 Conference The Need for Educational Research to Champion Freedom, Education and Development for All*. University of Cadiz, Cadiz, Spain, 17–21 September, 2012.

Opačić, G. (1995) *Ličnost u socijalnom ogledalu.* Beograd: Institut za pedagoška istraživanja.

Pinnegar, S., Mangelson, J., Reed, M. & Groves, S. (2011). Exploring preservice teachers' metaphor plotlines. *Teaching and Teacher Education 27 (3), 639–647.*

Ruohotie-Lyht, M. (2013). Struggling for a professional identity: Two newly qualified language teachers' identity narratives during the first years at work. *Teaching and Teacher Education*, 30, 120–129.

Schatz-Oppenheimer, O. & Dvir, N. (2014). From ugly duckling to swan: Stories of novice teachers. *Teaching and Teacher Education,* 37 (1), 140–149.

Simić, N. (2015b). Motivacija za izbor profesije nastavnik – Perspektiva budućih nastavnika, pripravnika i iskusnih predmetnih nastavnika. *Zbornik Instituta za pedagoška istraživanja*, 47 (2), 199–221.

Søreide, G.E (2007). *Narrative construction of teacher identity* [Doctoral Dissertation, Faculty of Psychology, University of Bergen, Norway].

Stojković, M. (2018). *Teachers' professional identity development* [Doctoral dissertation, University of Belgrade, Faculty of Philosophy].

Stojnov, D. (2005). *Od psihologije ličnosti do psihologije osoba: konstruktivizam kao platforma u obrazovanju i vaspitanju*. Beograd: Institut za pedagoška istraživanja.

Timoštšuk, I. & Ugaste, A. (2012). The role of emotions in student teachers' professional identity. *European Journal of Teacher Education*, 35 (4), 421–433.

Zhao, H & Zhang, X. (2017). The Influence of Field Teaching Practice on Pre-service Teachers' Professional Identity: A Mixed Methods Study. Frontiers in Psychology, 8:1264. DOI: 10.3389/fpsyg.2017.01264

Živković, P. (2015). Prekarijat i nastavnici na određeno vreme: pogled sa zapadne strane. *Teme.* 39 (3), 801–821.

Motivation for a Teaching Profession among Preservice Subject Teachers

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Abstract

The aim of this study was to explore reasons for choosing the teaching career, as well as reasons that dissuade students from choosing it, and thus to contribute to contemporary models of motivation for a teaching profession. Participants were 221 undergraduate students from Serbian faculties that educate future subject teachers. For this paper their answers on two open-ended questions were analyzed – on reasons for being motivated (221 answers) and on reasons for being demotivated (45 answers). Thematic analysis and deductive approach that relied on the Factors Influencing Teaching Choice (FIT-Choice) model were applied. Fifteen themes emerged with 12 corresponding to the FIT-Choice model's factors. The most frequent reasons for choosing a teaching career correspond to the Social utility value motive (f =160) and Intrinsic value (62) from the model. There were no answers that referred to Job transferability. Themes that did not match any of the FIT-Choice model's factors were Love for subject, Intellectual stimulation and continuous self-development, and Gendered choice. Among the demotivating factors, eight themes emerged: Low status and respect, Lack of abilities, Children's behavior, Administrative tasks, Routine and monotony, Relationship with colleagues, No advancement opportunities and Parents' behavior, out of which five were not recognized in the FIT-Choice model. Based on results recommendation for the improvement of the FIT-Choice model and scale were provided.

Keywords: motivation; demotivating factors; teaching profession; preservice teachers; FIT-Choice

Theoretical Framework

There is a growing awareness of teacher impact on instructional quality, student motivation and engagement and achievement (Baier et al., 2018; Hattie, 2009). Given that many countries face challenges regarding the quality of teaching, teacher status, teacher shortages and turnover (Jeon & Wells, 2018; Watt & Richardson, 2008) it has become relevant to explore preservice teachers' motivation for this profession.

Authors exploring motivation for the teaching profession usually talk about intrinsic (passion for teaching and interest for the subjects taught), extrinsic (job security, salary, holidays and flexibility) and altruistic motivation (serving children and society) (Brookhart & Freeman, 1992; Kyriacou & Coulthard, 2000). In a series of studies conducted on predominantly pre-service teachers from the United States, Ferrell and Daniel (1993) proposed six motivational orientations – motivational orientation to teach based on job security, worthwhile service to society, interpersonal relationships, (intellectual) stimulation, (material) benefits and continuation of work in familiar setting.

In their well-known and elaborated model of teacher motivation, the Factors Influencing Teaching Choice (FIT-Choice) model, Watt and Richardson (2007; 2008) proposed 12 motivation constructs: Perceived teaching abilities, Intrinsic values, Job security, Job transferability, Time for family (these three referring to Personal utility values, resembling extrinsic motivation), Shape future of children/ adolescents, Enhance social equity, Make social contribution, and Work with children/ adolescents (these four referring to Social utility values, resembling altruistic motivation), Prior teaching and learning experiences, Social influences and Fallback career. The model also includes four perceptions of a teaching profession: Expert career and High demand (both referring to job demands), Salary and Social status (both referring to job returns), as well as Social dissuasion, referring to social influences against the teaching as a career (Watt et al., 2012).

This model and accompanied research instrument (FIT-Choice scale) have been validated in many countries (e.g., Goller et al., 2019; Lin et al., 2012; Watt et al., 2012) but the factors Job transferability and Fallback career showed limited relevance in some contexts (e.g., Jugović et al, 2012). In one study (Kılınç et al., 2012), fewer motivation factors explained the data better (e.g., Shape future of children/adolescents, Make social contribution and Enhance social equity factor were combined into one). In the Serbian validation study Job security and Transferability merged in one factor, while Bludging (choosing teaching because it is an easy option that provides a lot of free time) appeared as a separate one (Simić et al., 2021). Moreover, some authors (Glutsch & König, 2019) pointed to the relevance of love for subject, factor that has been neglected in the FIT-Choice model.

The majority of studies on motivation for a teaching profession collected quantitative data and applied the well-established instruments such as the FIT-Choice scale, but there is a lack of studies that relied on more detailed qualitative elaborations. This study sought to fill in this gap by employing qualitative methodology to explore reasons for choosing the teaching profession, as well as reasons that dissuade students from choosing it.

Currents Study

Relying of the FIT-Choice model (Watt & Richardson, 2008) and the theory of Ferrell and Daniel (1993), in this study we strove to explore the reasons for choosing the teaching profession. We also explored reasons that dissuade students from choosing it, because we believed that understanding the opposite pole would enable us to better understand the construct of motivation for a teaching profession. Being grounded in interpretive paradigm, and using qualitative data enabled us to critically discuss current models of motivation for a teaching profession and provide recommendations for their improvement.

Method

Participants

Participants were 221 undergraduate students from Serbian faculties that educate future subject teachers (58.8% female, 45.2% studying STEM and 54.8% studying social science and humanities). They were approached by their professors during regular classes, participation was on a voluntary basis and only those who signed informed consents proceeded with research.

Data collection

Prospective teachers filled out an extensive questionnaire, but for this paper answers on two open-ended questions were analyzed – on reasons for being motivated and on reasons for being demotivated for a teaching career.

Data analysis

In total there were 221 answers about motivating factors and 45 answers on demotivating factors that were analyzed using qualitative text analysis, more specifically thematic analysis (Kuckartz, 2014). Due to theoretical underpinnings in FIT-Choice model, theory of Ferrell and Daniel and subsequent studies relying on their models, deductive approach was applied.

Results and Discussion

In their answers preservice teachers mentioned one to five motivating factors, two on average. Fifteen themes emerged with 12 corresponding to the FIT-Choice model's factors (see Table 1). The most frequent reasons for choosing a teaching career correspond to the Social utility value motive (f =160) and Intrinsic value (62) from the model. There were no answers that referred to Job transferability. The factor Prior teaching and learning experience proved to be more complex than in the model because not only positive role models motivate individuals to become teachers, but negative role models, as well.

Out of three themes that could not be categorized under any of the FIT-Choice factors, one was similar to Ferrell's and Daniel's intellectual stimulation (see Table 1). One theme was present neither in FIT-Choice, nor in Ferrell's and Daniel's model – we named it Love for subject (38). It might be considered similar to Intrinsic value, but it also implies desire to remain immersed in the discipline one loves. Moreover, in some cases it entails a desire to transfer the love for subject to the students. Finally, there were six answers that contained the theme of gender (teaching as the perfect career for females), which was not addressed in previous studies, but which contains elements of factors Social influences and Time for family (see Table 1).

Table 1. Themes related to motivational factors, frequencies, theoretical background and examples

Theme	f	Theoretical "origin"	Example
Work with children	74	FIT-Choice Model	*Work with youth inspires me.*
Shape future of children	67	FIT-Choice Model	*It is wonderful to be able to influence someone's life, to influence young people's view of learning and life.*
Intrinsic value	62	FIT-Choice Model	*Little can replace the feeling when you pass on certain knowledge to students and when you see that they use that knowledge in their own way, but in a style similar to yours.*
Love for subject	38	Present in sporadic studies (e.g., Glutch & Koenig, 2019)	*I want children to love mathematics, to see how interesting and beautiful it is. I want to bring the beauty of mathematics as close to children as possible.*
Intellectual stimulation and continuous self-development	26	Ferrell's and Daniel's theory	*Dynamic and creative job, no day is the same as previous one.* *Constant work on myself (reading literature, visiting museums, research)*
Perceived ability	18	FIT-Choice Model	*I think I can animate people and be interesting to them.*
Make social contribution	15	FIT-Choice Model	*I want to influence the development of the society in which I live, I believe that education is the basis of the development of every country.*
Job security	15	FIT-Choice Model	*Fixed working hours, regular salary*
Prior T&L experience	15	FIT-Choice Model	*With the school days, I "fell in love" with the teacher and the way she cooperated and talked to us students, so that interest starts from the earliest days.* *I would like to correct the mistakes of my professors.*
Bludging	14	FIT-Choice Model	*A lot of free time.*

Social influences	6	FIT-Choice Model	*In my family, there are all educators, so from an early age I was introduced to philosophical sciences and teaching.*
Fallback career	6	FIT-Choice Model	*I would like it to be my job until I find someone else, better.*
Gendered choice	6	/	*I think that is the most beautiful profession for a woman.*
Enhance social equity	4	FIT-Choice Model	*To detect children who come from disadvantaged backgrounds, but those who have the potential to be the most successful, in order to contribute to improving the quality of their life.*
Time for family	3	FIT-Choice Model	*As a teacher I will have enough time for my family.*

Among the demotivating factors, eight themes emerged. Low status and respect was the most frequent one, followed by perception of poor abilities (lack of patience or abilities to explain something in different ways), perception of work with children as exhausting and upsetting, administrative overload and perception of relationships with colleagues as challenging (see Table 2). Factor named Children's behavior can be understood as equivalent of Task demands factor from the FIT-Choice model. Two factors were opposite characteristics, antipodes of motivating factors, while five identified demotivating factors referred to characteristics unrecognized by the FIT-Choice model (see Table 2).

Table 2. Themes related to demotivational factors, frequencies, theoretical background and examples

Theme – demotivating factor	f	Theoretical "origin"	Examples
Low status and respect	20	/	*I think that teachers are not respected enough in this country*
Lack of abilities	10	Antipode of motivating factor Perceived abilities	*I don't have a lot of patience to work with children, and I don't like explaining things many times*
Children's behavior	7	Similar to FIT-Choice Task demands and Antipode to Work with children	*Ill-behaved children who have all rights*
Administrative tasks	7	/	*A bunch of paperwork, bureaucracy*
Routine and monotony	6	Antipode of Intellectual stimulation and continuous self-development	*The fact that I am not improving myself, but teaching the same material for years, is demotivating for me.*
Relationship with colleagues	5	/	*The fact that there is a competition among teachers, to see who has more power ... There is a kind of alienation.*
No advancement opportunities	2	/	*There was no progress. At school, the only thing you can be more than a teacher is the principal, and that honestly doesn't pay off.*
Parents' behavior	2	/	*The only reason I wouldn't want to be a teacher is because of parents. I think that they interfere too much.*

Conclusions and Implications

We can conclude that Serbian preservice teachers are primarily motivated to become teachers because of their altruistic motives and their love for teaching and the subject. Low status of a teaching profession is a factor that demotivate them the most. These results are similar to those determined in other, quantitative studies, with only Perceived teaching abilities being more dominant in studies that used the FIT-Choice scale (Marušić-Jablanović & Vračar, 2019; Simić et al., 2021).

As for the contemporary models of motivation for a teaching profession, certain improvements should be made so to embrace the holistic experience of diverse preservice subject teachers. Given that some studies (e.g., Jugović et al, 2012; Simić et al., 2021), including this one, did not recognize the relevance of Job transferability factor, authors of the FIT-Choice scale might consider making it optional and context specific. Although in theory and factor analyses of the FIT-Choice scale four subfactors of Social utility value may be distinguished, when teachers narrate about their reasons for choosing a teaching career, there are overlaps between these factors because they are very similar. Therefore, authors might consider merging some of them (e.g., Shape future of children is similar to Enhance social equality given they both refer to enabling children to grow; Contribute to society and Enhance social equality are similar because they both refer to making a society a better place).

On the other hand, some factors deserve more elaboration. One should differentiate between having positive and negative models in prior schooling, because many students were motivated to become teachers by their desire to be opposite to their teachers. Authors of the FIT-Choice scale should therefore consider adding items that refer to teachers as negative models. Love for subject, comprising both a desire to continue exploring discipline one love and a desire to instill that love and curiosity in students should become the regular factor of the contemporary models. The same counts for the factor referring to creativity and opportunities for continuous professional and personal development. Gender dimension should also be added, possibly into Social influences and/or Time for family, or at least considered as a context specific optional factor.

Task demands section of the FIT-Choice model should also be improved by recognizing the complexity and multitude of relationships and tasks. Scholars in the filed of education might consider relying on Job Demands and Resources theory when enriching their discussions of the complex field of perceptions and motivations for a teaching career.

Acknowledgments

References

Baier, F., Decker, A.-T., Voss, T., Kleickmann, T., Klusmann, U. and Kunter, M. (2019), What makes a good teacher? The relative importance of mathematics teachers' cognitive ability, personality, knowledge, beliefs, and motivation for instructional quality. Br J Educ Psychol, 89: 767-786. https://doi.org/10.1111/bjep.12256

Brookhart, S. M. & Freeman, D. J. (1992). Characteristics of entering teaching candidates. Review of Educational Research, 62, 37–60. https://doi.org/10.3102/00346543062001037

Ferrell, C.M. & Daniel, L.G. (1993). *Construct validation of an instrument measuring teacher career motivations* (paper presented at the annual meeting of the mid-south education research association, New Orleans, LA). East Lansing, MI: National Center for research on teacher learning (ERIC Document reproduction service no. ED365719).

Glutsch, N. & König, J. (2019) Pre-service teachers' motivations for choosing teaching as a career: does subject interest matter?, Journal of Education for Teaching, 45(5), 494-510. https://doi.org/10.1080/02607476.2019.1674560

Goller, M., Ursin, J., Vähäsantanen, K., Festner, D., & Harteis, C. (2019). Finnish and German student teachers' motivations for choosing teaching as a career. The first application of the FIT-Choice scale in Finland. Teaching and Teacher Education, 85, 235–248. https://doi.org/10.1016/j.tate.2019.06.023

Hattie, J. (2009). *Visible learning*. London: Routladge.

Jeon, L., & Wells, M. B. (2018). An Organizational-Level Analysis of Early Childhood Teachers' Job Attitudes: Workplace Satisfaction Affects Early Head Start and Head Start Teacher Turnover. *Child & Youth Care Forum, 47*(4), 563–581.

Jugović, I., Marušić, I., Pavin Ivanec, T., & Vizek Vidović, V. (2012). Motivation and personality of preservice teachers in Croatia. Asia-Pacific Journal of Teacher Education, 40(3), 271–287. https://doi.org/10.1080/1359866X.2012.700044

Kilinç, A., Watt, H. M. G. & Richardson, P. W. (2012). Factors influencing teaching choice in Turkey. Asia-Pacific Journal of Teacher Education, 40(3), 199–226. https://doi.org/10.1080/1359866X.2012.700048

Kuzkartz, U. (2014). *Qualitative text analysis*. London: SAGE.

Kyriacou, C. and Coulthard, M. (2000) Undergraduates' Views of Teaching as a Career Choice. Journal of Education for Teaching, 26, 117-126. http://dx.doi.org/10.1080/02607470050127036

Lin, E., Shi, Q., Wang, J., Zhang, S. & Hui, L. (2012). Initial motivations for teaching: Comparison between preservice teachers in the United States and China. Asia-Pacific Journal of Teacher Education, 40(3), 227–248.

Marušić-Jablanović, M., & Vračar, S. (2019). Exploring Serbian teachers' motivation for teaching with the application of FIT-choice scale. Zborik Instituta za pedagoška istraživanja, 51(1), 7–45. https://doi.org/10.2298/ZIPI1901007M

Simić, N., Marušić-Jablanović, M., & Grbić, S. (2021). Why teaching? A validation of the fit-choice scale in the Serbian context. *Journal of Education for Teaching.* https://doi.org/10.1080/02607476.2021.1958655

Watt, H. M. G., & Richardson, P. (2007). Motivational factors influencing teaching as career choice: Development and validation of the FIT-choice scale. The Journal of Experimental Education, 75(3), 167–202. https://doi.org/10.3200/JEXE.75.3.167-202

Watt, H. M. G., and Richardson, P. W. (2008). Motivations, perceptions, and aspirations concerning teaching as a career for different types of beginning teachers. Learning and Instruction 18(5): 408–428. https://doi.org/10.1016/j.learninstruc.2008.06.002

Watt, H. M. G., Richardson, P. W., Klusmann, U., Kunter, M., Beyer, B., Trautwein, U., & Baumert, J. (2012). Motivations for choosing teaching as a career: An international comparison using the FIT-Choice scale. Teaching and Teacher Education, 28, 791–805. https://doi.org/10.1016/j.tate.2012.03.003

A Person-Centered Perspective on Future Preschool and Class Teachers' Values in Terms of the Schwartz Refined Value Theory

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Abstract

Values are desirable goals, motivators to action, they function as criteria for our judgements, and decision making. The goal of the study is to identify types of preservice preschool and class teachers, according to their values, through secondary analyses of previously obtained data. The study (N-232) applies PVQ (Portrait Value Questionnaire)-57, measuring the 19 values of the Schwartz refined theory. A four-cluster solution was accepted, and the obtained clusters were placed on the adaptive-maladaptive continuum, starting from Self-transcendent cluster with socially focused members, respecting highly the welfare of others, compliance with norms and smooth functioning in social realm. Uncritical&Respect-seeking cluster tends to rate higher variety of values, with value Face standing out. Self-Enhancing cluster distinguishes by higher appreciation of Self-enhancement values, such as achievement and power. Members can be interested for the success of their students, but opt for dominance and prefer self-indulging. Indifferent cluster was placed closer to the maladaptive pole, due to lower appreciation of nature protection and equality, justice and protection for all people, and risk of being unmotivated.

Keywords: Schwartz refined theory, Serbia, cluster analyses

Theoretical Framework

Values are used to explain the motivational bases of human attitudes and behaviour and to recognize specificities of societies or individuals and to follow the course of change of these specificities over time (Schwatrz, 2006). In order to understand the choices people make, their lifestyle and preferences it is necessary to learn their values. In case of teachers it is especially important, since they have the pleasure and the responsibility of upbringing generations of children. Their influence of values can be reflected in: the attention they attribute to different parts of the curriculum, relative to the characteristics of their students, and in the goals they define for their students and the expectations they have from the students (Ennis, 1992).

Schwartz's theory of basic human values identifies ten values that people in all cultures distinguish, and determines their compatibilities and conflicts. The refined model recognizes smaller clusters of values within the basic ones, offering a 19 values model. This model has been confirmed in 15 samples from 10 countries (Schwartz et al., 2012). Its predictive validity was confirmed by finding the correlation between values and corresponding behaviours (Schwartz & Butenko, 2014).

Methodology

The present study contains secondary analysis of the data obtained in 2018 (Marušić Jablanović, 2018). The instrument applied was the PVQ-RR questionnaire (Schwartz, 2016), designed for measuring the 19 values of the refined model. Results confirm that PVQ-RR reproduces well the proposed structure of the 19 values (Schwarz & Cieciuch, 2022). The items consist of a statement, briefly describing beliefs typical for a certain value. The respondent needs to estimate how much he resembles the person described in the statement, on a 6-point scale, where 1 means "Not like me at all", and 6 "Very much like me" offering their own self-portraits[1].

The author of the present study tested the Schwartz model on a sample of 232 students, future preschool and class teachers (Marušić Jablanović, 2018). The data fitted well the theoretical model, the location of values obtained in the study corresponded to that predicted by the cicrumplex (with the exception of Universalism and Benevolence, that were in reversed order). Several values that are adjacent in the model were combined in the empirical data. The value hierarchy starts with Benevolence-care and ends with Power-resources.

Goal of the present study is to find types of the preservice preschool and class teachers, according to their values, through secondary analyses of previously obtained data. The analyses included K-means cluster analysis on the basis of the 19 values ratings. The author tested 2 to 5 clusters solutions, applied ANOVA with Games-Howell post-hoc test for mutual comparison of ratings of the 19 values. The four-cluster solution was accepted applying the criteria: number of iterations until stability, significance of ANOVA and the size of the obtained clusters. Then after, repeated measures ANOVA for comparing the ratings within each cluster was applied. The ANOVAs were performed on centered value scores, according to the authors' suggestions (Schwartz, 2016).

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[1] Sample item. *It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them* (Universalism-tolerance). (https://wiki.mgto.org/doku.php/portrait_value_questionnaire_pvq)

Results

Clusters' means and significant differences among them are presented in Table 1

Table 1: The 4 Clusters Value ratings AM, and significant differences in value ratings between the 4 clusters.

	Cluster 1, 12%	Cluster 2, 30%	Cluster 3, 32%	Cluster 4, 26%	Differences between Clusters
Self-direction thought	5,22	4,00	4,87	5,01	2<1,3,4; 1> 3
Self-direction action	5,40	4,56	5,07	5,07	1>2,3,4; 2<3,4
Stimulation	4,62	3,28	3,94	4,32	1>3; 2<1,3,4
Hedonism	5,11	3,21	3,71	4,79	1,4>2,3
Achievement	5,42	3,96	4,68	5,05	1>4>2,3
Power dominance	3,05	2,02	1,76	2,55	1,4>2,3
Power resources	2,86	1,75	1,67	2,44	1,4>2,3
Face	5,09	2,96	3,83	3,75	1>3,4>2
Personal security	5,50	4,45	4,97	4,92	1>3,4 >2
Social security	5,16	2,33	4,56	3,76	1>3>4>2
Tradition	4,72	3,38	4,78	3,93	2<1,4<3
Conformity rules	4,71	3,14	4,50	3,36	1,3>2,4
Conformity interpersonal	4,76	3,39	4,56	3,38	1,3>2,4
Universalism nature	4,67	2,95	4,57	3,79	1,3>2,4
Universalism concern	5,44	4,12	5,16	4,62	1,3>2,4
Universalism tolerance	5,20	4,37	5,14	4,45	1,3>2,4
Benevolence care	5,78	5,07	5,63	5,47	1>2,4;3>2
Benevolence dependability	5,67	5,01	5,61	5,38	1,3>2,4

• Cluster 1 named Uncritical and respect seeking has higher rating of variety of values with different motivational background, therefore it was named uncritical. They distinguish by high rating of their own public image and avoiding humiliation. Centered value scores discover the precedence of self-enhancement over self-transcendence and self-determination values. For example, Hedonism is rated higher than Benevolence-care (MD=.453, sig=.015) and benevolence-dependability (MD=.546, sig=.007), and Power dominance more than benevolence dependability (MD=.605, sig=.049).

• Cluster 2, named Indifferent, shows lower appreciation of different subsets of values: benevolence-care, self-enhancement values, openness to change, freedom and autonomy, dominance and influence. With the Bonferroni correction applied, there seems to be no hierarchy of values in this cluster, all the values are relatively unimportant.

• Cluster 3, named Self-transcendent and respectful rates universalism and conformity as high as Cluster 1, and Power as low as Cluster 2. They distinguish by the highest appreciation of Tradition. Conservation values are rated equally to universalism, Conformity-rules is more important than Achievement (MD=1.133, Sig=.000) and Tradition more than Personal security (MD=.663, Sig=023). Hedonism, rating it less than (Tradition MD=-1.185, Sig=.000, Conformity rules MD= -1.133, Sig=.000, Benevolence-care MD=-8.17, Sig=.000).

Discussion

The obtained clusters can be placed on the adaptive-maladaptive continuum, starting from Self-transcendent and respectful cluster, at the adaptive pole. According to their values, these students can be described as agreeable, respecting others, valuing creativity, and behaving according to the persisting social norms, contributing gladly to smooth functioning of social relations. Uncritical&respect seeking are coming next, with a risk of disappointment and frustration due to high appreciation of different values that can hardly be obtained at in any working context. High appreciation of mastery and success, facilitate and high goals for the students, and pronounced care about the public image may bring vain behavior. Self-enhancing cluster is closer to maladaptive pole, since success and pleasure have priority over tolerance and equity. They might be interested for the success of their students, but develop authoritarian style of teaching or be prone to bludging. Indifferent cluster might contain unmotivated teachers, with lower appreciation of nature protection and equality, justice and protection for all people or accepting people different from the majority. Therefore, the author places them closer to the maladaptive pole.

Conclusion

Among future preschool and class teachers, four groups whose values differ qualitatively can be identified, varying on the adaptive-maladaptive continuum. Knowing these groups can improve tailor-made discussions in the context of pre-service teachers education.

Acknowledgments

References

Ennis, C. D. (1992). The Influence of Value Orientations in Curriculum Decision Making. *Secondary School Physical Education 44*(3), 317-329. https://doi.org/10.1080/00336297.1992.10484058

Marušić Jablanović, M. (2018). Value priorities of future preschool and class teachers in Serbia in terms of the Schwartz refined value theory. *Psihologija*, *51*(2), 143-161.

Schwartz, S. H. (2006). Basic human values: Theory, measurement, and applications. Revue Francaise de Sociologie. 47. 929-981.

Schwartz, S. H., (2012). An overview of the Schwartz theory of basic values.*Online Readings in Psychology and Culture*, *2*(1), 1–20. https://doi.org/10.9707/2307-0919.1116

Schwartz, S. H. (2016). Coding and analyzing PVQ-RR data (instructions for the revised Portrait Values Questionnaire).
http://dx.doi.org/10.13140/RG.2.2.35393.56165

Schwartz, S. H. & Butenko, T. (2014). Values and Behavior: Validating the refined value theory in Russia. *European Journal of Social Psychology, 44*(7), 799-813. https://doi.org/10.1002/ejsp.2053

Schwarz, S. H. & Cieciuch,, J. (2022). Measuring the Refined Theory of Indidividual Values in 49 Cultural Groups: Psychometrics of the Revised Portrait Value Questionnaire, *Assesment 29*(5), 1005-1019.
doi.org/10.1177/1073191121998.

Teachers' Motivation and Skills for Technology Use in Teacher Inquiries

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Abstract

The current study aims to investigate Estonian teachers' perceptions of their own technology use and teacher inquiry (TI) activities, as compared to their actual use in practice. Based on a survey with 40 school teachers and three focus group interviews, a preliminary picture of the situation is drawn and compared to the actual classroom activities of twelve teachers from the same sample. Descriptive statistics and thematic analysis of the data reveal that technology use for teaching purposes has become commonplace in Estonia, while teacher inquiry and use of technology for data collection and analysis is still in its infancy. 90% of the teachers participating in the survey rate their confidence in technology use as high or fairly high and around 75% of the teachers claim to be thinking about their teaching often or all the time. Although the focus group interviews demonstrate some set-backs (things take longer online, student engagement is more difficult), teachers coped with the pandemic-time use of technologies well, though online teaching needed different planning. As to TI, teachers expect some support with it; they find TI extremely time-consuming; and wish that technology could make documenting TI and the whole process simpler. Notwithstanding, 26 teachers (65%) claim to be highly motivated to learn more about the practices of teacher inquiry. The need for support in these spheres is also indicated by the fact that several issues surface when the teachers carry out teacher inquiry. These are linked mostly to low data use and research skills, which Estonian teachers have not yet mastered. The paper provides some lessons learned about teachers' use of technology and teacher inquiry, and suggests lines for further research.

Keywords: teachers' technology use; teacher inquiry; teacher motivation and skills; data use

Introduction

Research indicates that teachers could draw invaluable information for their pedagogical decision-making from Teaching and Learning Analytics (Sergis & Sampson, 2017). However, this requires certain skills in technology use and teacher inquiry, as well as motivation to involve in these activities. What is the situation like among teachers? Do they feel confident to use technology (for teaching as well as for inquiry)? How do teachers perceive their technology use in their classrooms and how much does this picture correspond to reality? The current study aims to investigate Estonian teachers' perceptions of their own technology use and teacher inquiry (TI) activities, as compared to their actual use in practice.

The study was conducted within the Erasmus+ Illumine project, which offered teachers a collaborative study group, where they could learn about different efficient evidence-based teaching practices, co-create interventions together and, thereafter, try these lessons out with their own students. The main aim was to improve teaching practices with novel approaches from the science of learning (such as retrieval practice, spaced and distributed learning, reframing mindsets, etc.), but it was not less important that teachers could have a chance to carry out teacher inquiry, use different digital tools for teaching and collecting data, analyze the outcomes in groups, and help develop evidence-based teaching strategies for their colleagues.

Although Estonian teachers, voluntarily participating in the project, were attracted to the novel teaching strategies and conducting teacher inquiries, the latter did not come easily. Focus groups (with 10 teachers prior to the project start) and research lesson diaries of 12 participants reveal great enthusiasm but also several obstacles, from lack of skills to conduct teacher inquiry to low application of technology in the process. Therefore, development of guidelines and possibilities, which help teachers enhance their teacher inquiry skills, is of utmost importance.

Theoretical Background

Teachers are generally interested in addressing issues in their teaching and making students learn in the most efficient ways (Dana & Yendol-Hoppey, 2019). One way to analyze and improve teaching is through reflection, especially when it is data-informed and carried out in a structured way – in the form of teacher inquiry (TI). Reflection helps teachers to re-examine their teaching practices and make necessary changes (van Leeuwen et al., 2019; Mansfield, 2019). So, when teachers need assistance in their pedagogical decision making, they can employ Teaching and Learning Analytics (Sergis & Sampson, 2017) in the form of data collected and analyzed with the help of technology, or carry out Teacher Inquiry processes (Hansen & Wasson, 2016; Saar et al., in print; Schildkamp, Poortman & Handelzalts, 2016).

The majority of teachers work with student-related data (Dawson et al., 2019), although for a fuller picture, teachers should also employ teaching data (Ndukwe & Daniel, 2020; Saar et al., 2022; Sergis & Sampson, 2017). Availability of such data, however, is scarce and teachers have not yet developed habits of working with data about teaching (Saar et al. 2022). For example, Brown et al. (2017) emphasize the need for scaffolding and offer a conceptual model that combines data use and teacher inquiry. Also, teachers' awareness of different technological tools which could be used for purposeful data collection, from both online and real classrooms, seems to be limited (Saar et al., 2022). Nevertheless, technology enhanced data-collection could assist teachers in adopting data-informed decision-making into their daily teaching (Mandinach & Jimerson, 2016).

To adopt purposeful data use, teachers require certain data literacy skills (Mandinach and Gummer, 2016a) and confidence in technology use. However, not much is known about teachers' perception of their technological and TI skills, nor about their actual application in practice. For example, Estonia is considered an e-country where schools are well equipped with computers, students bring their own

devices to schools, and the country is well covered with internet access. Therefore, one might think that Estonian teachers use technology for teaching all the time. However, little is known what the situation actually is like, and if teachers also research the impact of technology use in their classrooms.

Based on an online survey of 40 school teachers, and focus group interviews with 10 teachers (1/4 of the survey sample), a preliminary picture of the situation is drawn and compared to the actual activities of twelve teachers (from the same sample) in their daily work. The aim is to explore how Estonian teachers perceive their technological and teacher inquiry skills as compared to their actual technology use in their teaching practices. In addition, teachers' motivation to use technology and related teaching strategies is investigated. The research questions guiding the study are:

1) How do teachers perceive their technological and TI skills?

2) How do these perceptions correspond to reality?

Methodology

The study follows a mixed methods approach. First, an online survey (containing both scales and open ended questions) was carried out in Estonia in 2021 to get an overview of teachers' perceived technological skills and teaching practices. Forty school teachers (86% female; 48% with over 20 years of experience, 40% upper-secondary) from different schools participated. Then three focus group interviews (with 10 teachers from the same sample) were conducted to elaborate on the survey topics and draw a preliminary picture of the situation. Finally, 12 teachers researched their own teaching in actual classroom activities using Teacher Inquiry, and keeping records of their technology use and teacher inquiry processes.

The survey was based on the EU SELFIE (Costa, Castaño-Muñoz & Kampylis, 2021) and Technological pedagogical content knowledge (TPACK) (Schmidt, Baran, Thompson, Mishra, Koehler, & Shin, 2009) subscales. Table 1 provides an overview of the survey sample.

Table 1. The sample of the initial survey.

age:	below 29: 15%	30 – 49: 42.5%	over 50: 42.5%
gender:	male: 5 (12.5%)	female: 35 (87.5%)	
work years:	1-5 years: 7 (17.5%)	6-20 years: 14 (35%)	over 20: 19 (47.5%)
school level:	upper-secondary: 13 (32.5%)	lower-second.: 22 (55%)	other levels: 5 (12.5%)
subject:	languages: 22	sciences: 22	humanities: 9

During the focus group the same questions as in the survey (about TI and technology use for teaching and TI) were asked for elaborated descriptions. The focus group sample is described in Table 2.

Table 2. The sample of the focus groups.

age:	under 30: 0	30 – 49: 3	over 50: 7
gender:	male: 1	female: 9	
work:	1-5 years: 1	6-20 years: 1	over 20: 8
school level:	upper-secondary: 4	lower-secondary: 7	other levels: 3
subject:	languages: 7	sciences: 1	humanities: 4

Case studies were carried out based on the Analytics Model for Teacher Inquiry (Saar et al., in press). An overview of the sample is presented in Table 3. Each teacher picked 1-2 teaching strategies introduced to them during Illumine workshops (e.g. retrieval practice, distributed and spaced learning, reframing mindsets, etc.) and applied these in their teaching for a month. Teachers collected and analyzed data from these interventions (e.g. student engagement data, test results, student feedback on their stress level and suitability of the new learning strategies, etc.) and presented their findings to their colleagues at Illumine workshops.

Table 3. The sample of the participants in the Illumine case studies.

age:	under 30: 0	30 – 49: 3	over 50: 9
gender:	male: 1	female: 11	
work:	1-5 years: 1	6-20 years: 3	over 20: 8
school level:	upper-secondary: 6	lower-secondary: 9	other levels: 3
subject:	languages: 8	sciences: 1	humanities: 4

The survey data were analyzed using descriptive statistics and thematic analysis, to get an overview of teachers' opinions with thick descriptions. Focus group interviews were transcribed and then analyzed using inductive thematic analysis (Braun & Clarke, 2006). Research diaries of the 12 teachers were analyzed using content analysis (Schreier, 2012) to compare the findings from these action research case studies (actual use of technology and teaching practices) with teachers' perceptions expressed in the survey and focus groups. When thematic analyses focused on finding out common categories, content analysis also includes frequency data of the emerging categories, which enables comparison with data from descriptive statistics.

Due to a small sample size the results of this study cannot be generalized, however they provide an initial picture of the situation that is necessary to probe into teachers' perceptions and habits with data use.

Results

The initial survey with 40 school teachers (an overview in Table 4) reveals that among the participating teachers, technology use for teaching purposes has become commonplace in Estonia, while teacher inquiry and use of technology for data collection and analysis is still in its infancy. Confidence in **using ICT** for preparing and in delivering the learning content is high, as 36 out of 40 teachers feel (very or fairly) confident in this and 32 teachers are confident in using different technology and digital

materials. Only two teachers cannot pick technologies for efficient teaching and three do not know how to support learners with the help of technology. Five teachers do not feel confident when they have to adapt the use of new technologies for different classroom activities. However, 70% of the respondents marked their motivation to use technologies very high (6 and 7 points on a 7-point Likert scale) and 25% marked it as fairly high (4-5 points), and only 5 percent as rather low (2-3 points) whereas nobody selected 1 on the Likert scale.

Table 4. An overview of the survey results (N= 40 teachers).

Teachers' perceptions about technology use for teaching purposes	
36 teachers	feel very or fairly confident when using technology for teaching purposes
32 teachers	feel confident in using different technology and digital materials
5 teachers	feel insecure when they have to use new technologies for different classroom activities
2 teachers	cannot pick technologies for efficient teaching
3 teachers	do not know how to support learners with the help of technology
Teachers' actual use of technology	
25 teachers	use technology to create positive environment
23 teachers	use technology to alleviate stress
22 teachers	use technology to raise students' motivation
22 teachers	use technology to promote group work skills
17 teachers	use technology to improve student attention
14 teachers	use technology to support deep learning
14 teachers	use technology to support metacognitive skills
Teachers' perceptions about Teacher Inquiry (TI)	
33 teachers	use TI to improve student concentration
33 teachers	use TI to support deep learning
33 teachers	use TI to guide students to reflect on learning
Teachers' actual use of Teacher Inquiry (TI)	
36 teachers	claim to research their own teaching
18 teachers	have some experience in conducting actual TI
8 teachers	shared their results at conferences or seminars

90% of the teachers (n=36) participating in the survey also claim to be thinking about their teaching often or all the time while 26 teachers (65%) are also highly motivated to learn more about the practices of teacher inquiry. Thematic analysis of teachers' **motivation to use technology** for preparing and conducting teaching reveals three main reasons, linked to students, teachers themselves and the situation: first, teachers use technology to **activate and motivate students**, their engagement – through fast feedback and variety in learning activities; also, to develop interest in learning and technology in general; and to enhance 21st century skills and get better results.

Another promoter for technology use is **personal interest** – a wish to advance teachers' own skills and knowledge (personal development); possibility to reuse the materials teachers create; to get analytics from the tests and tasks; and predisposition towards technology (which have been researched and proven efficient and simple to use). The third motivator is **necessity** - during the Covid-19 pandemic teachers just had to make use of the available technology. However, teachers feel **less motivated** when there are not

suitable ready-made materials, access to some devices might not be available at the time suitable for them, or when the time spent on preparation does not outweigh the learning gains.

As to the **actual use of digital technologies**, Estonian teachers employ these mostly to raise students' motivation (n=22) and create positive learning environments (n=25), to alleviate stress (n=23) and promote group work skills (n=22). Quite often digital technologies are also used to improve student attention (n=17), support deep learning (n=14) and metacognitive skills (n=14). Estonian teachers expressed their readiness to develop their skills in using technology to enhance all these aspects (n=30), but especially their competence to raise student motivation (n=35) and create positive emotions (n=34) with the help of technology.

When asked about their motivation to **use teaching strategies** that have proven to yield better results, teachers' responses divide between very motivated (72.5%) and motivated (27.5%). Based on the survey, teachers in Estonia mostly use **evidence-based teaching** to improve student concentration (n=33), and support deep learning (n=33) or guide students to reflect on their own learning (n=33). Motivation to learn more about evidence-based practices is rather high, as the majority of teachers (n=30) would be willing to improve in it, especially when it comes to supporting deep learning (n=33), alleviating stress (n=33), raising motivation (n=34) and positive emotions (n=34). Teachers express willingness to adopt evidence-based practices 'because **these strategies work** and students seem to like them more; learning should be as efficient as possible; learning to learn is a life skill; no need to invent a bicycle; these strategies help to promote learning and make learning easier'. Another reason is linked to '**curiosity and personal interest** or personal experience (that has helped me learn); no wish to waste time on inefficient activities; evidence-based learning and teaching strategies have been proven more useful; seeing the efficiency of the strategies and happy student faces also motivates me; it saves time'. On the other hand, **lack of time and energy** are the main obstacles on the way to using new evidence-based strategies.

However, the responses become more versatile when it comes to the **reality of teachers' work**. Although 36 teachers claim that they research their own teaching, only half of them have had any experience in **conducting actual teacher inquiry**, a quarter have researched teaching beyond their own personal interest and 8 have shared their results at conferences or seminars. However, 65% of the teachers would be willing to develop their competences in the aspect of teacher inquiry. Their main motivation is to 'become a better, more efficient teacher' and 'providing students with better possibilities'.

To get a clearer picture of the actual use of digital technologies and teacher inquiry, three 50-minute **focus group interviews** were conducted with 10 teachers from seven schools (sample data in Table 2). The focus groups revealed that during the Covid-19 pandemic Estonian teachers participating in the focus group transferred to online

teaching rather smoothly. In some forms hybrid teaching continues even now (absent students can participate online). For some teachers, technology use has improved when compared to pre-Covid time, while others do not use digital tools as much in their face-to-face classes, unless they have discovered some really useful sites.

One teacher out of ten (also an educational technologist, who always uses digital tools in her classes) tried to reduce students' computer-time during lock-down (as other teachers had switched to video classes). However, post-pandemic, she uses hybrid classes so that students who are absent from school can still attend her classes in real time. Overall, teachers in Estonia seem to be fairly flexible when it comes to technology use, as it depends on their students' current needs (overall screen time, absence from school, less used in music classes). On the other hand, more frequent use of technology has made teachers more confident, trusting, bolder and flexible, but also more demanding. Therefore, the teachers align technology use with the purpose of their lesson, and technology use does not depend on teachers' skills in technology use.

Discussion and Lessons Learned

In general, the Estonian teachers rated their confidence in technology use mostly as high or fairly high and demonstrated varied technology use for teaching purposes. Also, despite some set-backs (things take longer online, student engagement is more difficult) teachers coped with the pandemic-time use of technologies well, though online teaching needed different planning. Based on these findings, it could be said that teachers' perceived use of technology in Estonia corresponds quite well with the actual situation. Even teachers who do not feel very confident with technology could switch to online teaching during the Covid-19 pandemic, and adopted several new technology-mediated teaching strategies. This is consistent with other research about Estonian teachers' technology use (Adov & Mäeots, 2021), as well as with research from other countries (Brown, McLennan, Mercieca, et al., 2021; Putri, Purwanto, Pramono, Asbari, et.al., 2020; Van der Spoel, Noroozi, Schuurink & van Ginkel, 2020) that demonstrate technology adoption despite several challenges. Still, teachers' higher technology skills do not necessarily mean more technology use (post-pandemic), as teachers are aware of students' increased digital footprint, online safety, and other issues, and turn to technology rather when it seems necessary and is also easy to use (i.e. access to devices). This is consistent with Schmid, Brianza & Petko (2020) who also state that technology use alone does not indicate quality, it has to be used purposefully.

However, when it comes to Teacher Inquiry (TI), it transpires that TI has not become a routine in Estonian schools. When the survey participants claimed to be thinking about their teaching often or all the time, only half of them have had any experience in actually conducting TI, a quarter have researched teaching beyond their own personal interest or shared their results with colleagues. Also, teachers expect some support with TI. They found TI extremely time-consuming; and wished that technology could make documenting TI and the whole process simpler. Even when the teachers, who participated in the 'Illumine' project, knew what they wanted to learn from the TI, they found it difficult to formulate the inquiry questions (initially only two succeeded). In addition, only four used technology for data collection (though all used technology for teaching) and six managed to interpret the data. This demonstrates that even teachers who are motivated to explore their teaching need assistance with TI and technology use in the process. This is consistent with research indicating the need for support in TI adoption (Mandinach & Schildkamp, 2021; Saar et al., in print; Wise and Jung, 2019) and might also explain why teachers, who use technology for instruction on a regular basis, hardly employ it for data-collection and TI.

The main lessons learned from the pandemic-time **use of technologies** are that:
• teachers are really creative and many new ideas were used to activate students in online classes;
• things take longer online, especially creating accounts, logging in, etc.;
• student engagement is more difficult online (cheating, not participating);
• teachers are concerned about students' personal data online, their digital footprint;
• online teaching takes better planning - what (and how) students could do/work on their own, teach each other, etc.
• teachers could have used even more technology if they knew exactly how technology could help and had more time to experiment with different tools.

Teachers' opinions about **teacher inquiry** revealed mostly three things:
• teachers require support, e.g. study groups where to share ideas and get straightforward instructions on what steps to take and try out;
• time is scarce: although teachers are ready and willing to analyze their own teaching, they find it extremely time-consuming and difficult;
• technology should help with fast reflections, and enable easy documentation of the teacher inquiry process.

The need for support in these spheres is also indicated by the fact that several issues surfaced when the teachers carried out teacher inquiry. Based on the sample of 12 teachers who participate in the 'Illumine' project and report on their technology use and teacher inquiry processes. The following challenges emerged: wording the inquiry questions seems to be an obstacle in a teacher inquiry, as even when teachers have clear intentions about what they want to find out about their teaching and students' learning, they find it difficult to formulate the inquiry questions (only two out of 12 did this for their first intervention). Also, only four out of 12 teachers in the 'Illumine' project used technology for data collection during their first intervention (though all of them used technology for teaching) and only six managed to analyze the

data initially. Others used pen & paper and did not have time or skills to analyze the collected data on their own (i.e. they needed support from a mentor). However, the first inquiry process and support materials proved useful for these teachers in preparing the second phase of the teacher inquiry as they expressed more confidence in planning their second intervention as well as eagerness to analyze the data. The main takeaways from the interventions reveal both failures as well as successes, mostly connected with the use of novel technology and teaching strategies. The teachers also felt that teacher inquiry should be expanded over a longer period (several months) and reported students' excitement (higher motivation to learn) when participating in a teacher inquiry.

Although we cannot generalize, it seems that technology adoption is no more a problem at schools. Rather, more emphasis should be laid on researching and developing technological solutions that teachers can use based on their needs and affordances. Also, more research is necessary to understand what technology could help teachers better engage in TI.

References

Adov, L., & Mäeots, M. (2021). What can we learn about science teachers' technology use during the COVID-19 pandemic?. Education sciences, 11(6), 255.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology, 3*(2), 77-101.

Brown, J., McLennan, C., Mercieca, D., Mercieca, D. P., Robertson, D. P., & Valentine, E. (2021). Technology as thirdspace: teachers in Scottish schools engaging with and being challenged by digital technology in first COVID-19 lockdown. *Education Sciences, 11*(3), 136.

Brown, C., Schildkamp, K., & Hubers, M. D. (2017). Combining the best of two worlds: A conceptual proposal for evidence-informed school improvement. *Educational research, 59*(2), 154-172.

Costa, P., Castaño-Muñoz, J., & Kampylis, P. (2021). Capturing schools' digital capacity: Psychometric analyses of the SELFIE self-reflection tool. *Computers & Education, 162*, 104080.

Dana, N.F. & Yendol-Hoppey, D. (2019). *The Reflective Educator's Guide to Classroom Research: Learning to Teach and Teaching to Learn Through Practitioner Inquiry*. Corwin.

Dawson, S., Joksimovic, S., Poquet, O., & Siemens, G. (2019). Increasing the impact of learning analytics. In *Proceedings of the 9th international conference on learning analytics & knowledge*, 446-455.

Hansen, C. J., & Wasson, B. (2016). Teacher inquiry into student learning: The TISL Heart Model and method for use in teachers' professional development. *Nordic Journal of Digital Literacy, 11*(01), 24–49.

Mandinach, E. B., & Gummer, E. S. (2016). *Data literacy for educators: Making it count in teacher preparation and practice*. Teachers College Press.

Mandinach, E. B., & Jimerson, J. B. (2016). Teachers learning how to use data: A synthesis of the issues and what is known. *Teaching and Teacher Education, 60*, 452-457.

Mandinach, E. B., & Schildkamp, K. (2021). Misconceptions about data-based decision making in education: An exploration of the literature. *Studies in Educational Evaluation, 69*, 100842

Mansfield, J. (2019). *Pedagogical equilibrium: The development of teachers' professional knowledge*. Routledge.

Ndukwe, I. G., & Daniel, B. K. (2020). Teaching analytics, value and tools for teacher data literacy: A systematic and tripartite approach. *International Journal of Educational Technology in Higher Education, 17*(1), 1-31.

Putri, R. S., Purwanto, A., Pramono, R., Asbari, M., Wijayanti, L. M., & Hyun, C. C. (2020). Impact of the COVID-19 pandemic on online home learning: An explorative study of primary schools in Indonesia. *International Journal of Advanced Science and Technology, 29*(5), 4809-4818.

Saar, M., Prieto, L. P., & Rodríguez Triana, M. J. (2022). Classroom data collection for teachers' data-informed practice. *Technology, Pedagogy and Education, 31*(1), 123-140.

Saar, M., Rodríguez-Triana, M.J., Prieto, L.P. (in print). Towards Data-Informed Teaching Practice: A Model for Integrating Analytics with Teacher Inquiry. *Journal of Learning Analytics*.

Schildkamp, K., Poortman, C. L., & Handelzalts, A. (2016). Data teams for school improvement. *School Effectiveness and School Improvement, 27*(2), 228–254.

Schmid, M., Brianza, E., & Petko, D. (2020). Self-reported technological pedagogical content knowledge (TPACK) of pre-service teachers in relation to digital technology use in les-son plans. *Computers in Human Behavior*, 106586.

Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S. (2009). Technological pedagogical content knowledge (TPACK) the development and validation of an assessment instrument for preservice teachers. *Journal of Research on Technology in Education, 42*(2), 123-149.

Schreier, M. (2012). *Qualitative content analysis in practice*. Sage publications.

Sergis, S., & Sampson, D. G. (2017). Teaching and learning analytics to support teacher inquiry: A systematic literature review. In: *Learning analytics: Fundaments, applications, and trends*, 25-63. Springer, Cham.

Van der Spoel, I., Noroozi, O., Schuurink, E., & van Ginkel, S. (2020). Teachers' online teaching expectations and experiences during the Covid19-pandemic in the

Netherlands. *European journal of teacher education, 43*(4), 623-638.

van Leeuwen, A., Rummel, N., & Van Gog, T. (2019). What information should CSCL teacher dashboards provide to help teachers interpret CSCL situations?. *International Journal of Computer-Supported Collaborative Learning, 14*(3), 261-289.

Wise, A. F., & Jung, Y. (2019). Teaching with analytics: Towards a situated model of instructional decision-making. *Journal of Learning Analytics, 6*(2), 53-69.

Factors influencing collaboration in assistive technology use in preschool and school institutions: involvement of educators[1]

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Abstract

C-board is a web Augmentative and Alternative Communication (AAC) application meant for persons not able to effectively use speech or writing. Adapted to the Serbian language, it is available in open access and is recommended for the promotion of communication, education, and inclusion of children with complex communication disabilities in regular school. This qualitative exploratory study is a formative evaluation of the C-board implementation with special attention to transfer to educational institutions. A semi-structured focus group discussion included a moderator, note-taker, and 6 practitioners working with the C-board: special education teachers, professional associates, and language therapists. The participants discussed their viewpoints, barriers, and facilitators regarding the C-board use, and educators' involvement in the partnership. The data were analyzed by inductive content analysis. The research suggests that partnership is the major obstacle to developing adequate support in the educational context. The findings reveal that educators' involvement is dependent on several groups of determinants: a. parent-related factors b. educator-related factors, c. partnership in process management, and d. institutional support.

Keywords: communication difficulties; C-board; Augmentative and Alternative Communication; inclusive education; educational institutions; involvement of educators

Introduction

Children naturally become competent communicators without any explicit instruction. This is severely hindered in children with complex difficulties in communication (autism, cerebral palsy, severe speech and language disorders, intellectual impairments, and acquired conditions). These can cause ineffective interaction with people and risks for development. Without early support to remediate developmental delay, children's participation in society is harshly limited.

The C-board is a tablet or smartphone **Alternative and Augmentative Communication (AAC)** application to enhance or replace speech or writing for children with impairments in spoken or written language (Aldabas, 2021). It is a speech-generating device based on graphic symbols that allow words and text to be turned into speech for communication. It enables simple and complex sentence production, arouses interaction, and helps a child to overcome language disorder through new experiences and learning. It extends and enriches the content of communication and improves communicative skills from an early age, enabling the accessibility of quality education for vulnerable groups.

Figure 1. C-board

Fifty C-board devices with the Serbian language application were distributed to children/families from different cities (Sremska Mitrovica, Novi Sad, Belgrade)[2]. According to the **Early Intervention Framework** (Kovač Cerović, T., Pavlović Babić, D. Jovanović, O., Jovanović, V., Jokić, T., Rajović, V., Baucal, I., 2014) this project promoted support for communication, education, and social inclusion of young children with severe communicative disabilities.

C-board implementation is based on features matching the developmental needs of a child. The **Individual Education Plan** meets the present levels of the child's educational performance and provides specialized instruction and services.

Instead of mostly relying on expert decisions, a close, reliable, and coherent **Partnership Model** between stakeholders (child, parents, speech and language therapists, teachers, and institutions) is necessary to meet the continuously changing special education needs of a child.

The issue of generalization

Perhaps the most significant issue about the effectiveness of AAC is the question of its **generalization to a wider real-life context** beyond therapy sessions. **The symbol-rich environment** is crucial for a child to establish **meaningful communication with different collocutors in different social circumstances** throughout the day (Chung & Douglas, 2014). This is naturally present in school since it is a place where a child can permanently practice and improve new communicative skills and share complex conceptual knowledge (Andzik, Chung, Doneski-Nicol, Dollarhide, 2019).

The typically developing child will have been exposed to oral language for approximately 4,380 waking hours by the time he begins speaking at about 18 months of age. If someone is using a different symbol set and only has exposure to it two times a week, for 20 – 30 minutes each, it will take 84 years to have the same experience with his symbols that the typically developing child has with the spoken word in first 18 months.
Jane Korsten, OTR, QIAT ListServe, 4/4/2011

Aims of the study

After the first evaluation of the C-board implementation in Serbia (Golubović and Glumbić, 2020) it was necessary to evaluate the generalization of its usage, and the stakeholders' partnership as essential conditions for its success. **The focus was on the educational context as crucial for the generalization of new communicational skills to new interaction in a wide society.** The study aimed to:

- explore the barriers and facilitators for the C-board implementation in a wider social context;
- explore the partnership and collaboration
- overcome one-sided, black-and-white estimation of the C-board implementation;
- formulate recommendations for future steps.

Method

We conducted a **semi-structured online focus group** discussion with practitioners using the C-board and made a formative evaluation, in the form of **qualitative inductive content analysis.**

Participants. Six practitioners: 2 speech and language therapists, 2 teachers in special education primary schools, and 2 professional associates in preschool institutions in Belgrade and Novi Sad. The conversation was moderated and prepared by a moderator and note-taker.

Results

BARRIERS. The following barriers to C-board implementation were pointed out.

The COVID-19 pandemic. The C-board implementation was mostly restricted to the online sessions between the SLT and a child which greatly confined educators' and peers' participation in its implementation.

Low parental involvement. Parents as the most concerned and sensible partners **feared that C-board use would discourage their child to use oral language**. They worried about how to understand their child communicating through the C-board, and about **negative social stigma**.

The parents met **SLTs with conflicting views on the effects of C-board usage**. While some recommended its implementation, others argued that children and parents should have direct communication not be mediated by any kind of device.

Ineffective partnership. A parent might decide not to carry the C-board to school or SLT sessions regularly, or to leave the C-board at school, not using it at home. It revealed fluctuations in parental motivation and created difficulties in the child's progress.

Different dynamics in the motivation of parents and educators were reported, probably caused by a deficiency in parents' knowledge and their black-and-white expectations of the C-board.

When a child makes progress and starts to speak, the educator's motivation increases and he/she starts to use C-board in the classroom. On the contrary, parental motivation in such situations decreases and he/she tends to discard the C-board.
Kindergarten professional associate

The educators-related factors. The excellent collaboration between SLTs and parents was insufficient to ensure a steady transfer of C-board usage to an educational setting if the educator's motivation was low due to the **unfavourable working context:** work in large groups of children (20-30); C-board tablet perceived by peers as a gaming device; low educators' expectations of the effectiveness of AAC practice; low educators' knowledge about the importance of AAC and potential developmental benefits for children; lack of C-board training programs for educators.

Institutional factors. Maybe the most influential factor in educators' motivation is the **absence of institutional support and the lack of a clear definition of liability** for the C-board use in kindergartens and schools. Moreover, there was **no legal support for the intersectoral cooperation** between educational, health, and social institutions. Creating and implementing the IEP for a child with communication disabilities implies a high degree of cooperation, while institutional professional associates are rarely trained for C-board implementation.

FACILITATORS. Factors facilitating the C-board use and generalization of the acquired skills to new social situations.

Support for parents. Continuous collaboration with SLT nourished the sustaining of C-board use in different circumstances: setting achievable goals with an expert, defining steps and techniques motivating both child and parents, and reliable technical support.

Support for educators from a trained expert. Networking with other colleagues implementing the C-board and sharing the AAC experiences from the classroom.

Permanent collaboration and partnership between stakeholders was the most important factor of progress. Although it was not possible to establish continuous and equal support from all, every step in building collaboration was significant for the improvement.

TWO APPROACHES in the C-board implementation were taken by practitioners.

First, the C-board is considered a **tool for symbolic communication** to lay the ground for language, conceptual thinking, and social interaction (Vygotsky, 1980). Effective AAC usage requires evidence-based design and scaffolding to meet the actual communicative needs of a child.

In the second approach, C-board is considered a **didactic tool** typically used with primary school children. Even though it increases knowledge in specific domains (e.g. vegetables in naming tasks), it does not contribute **to the development of complex language expressions for highly functional communication.**

I want to learn more on the complex use of communicators in the coming period – for children not only to show what they need at a moment but also to produce more complex sentences for highly functional communication.

Speech and language therapist

Discussion and Recommendations

The C-board implementation in Serbia suffered from low coordination and partnership between stakeholders, and low integration in educational setting, and wider social context. Literature suggests that despite the great developmental benefit the AAC can trigger, a significant number of children and families discard or underuse AAC (Berenguer, Martínez, De Stasio, and Baixauli, 2022; Moorcroft, Scarinci, & Meyer, 2019).

The parent is the most exposed and sensitive participant in the chain of support for a child with communicative impairments. **Improvement of parental knowledge of the child's developmental potential is crucial.**

Acquainting educators with the developmental benefits of AAC for a child is necessary as well as theoretical knowledge and implementation skills. Implementing IEP based on AAC requires **trained expert supervision** and sharing experience with other educators using it. The stakeholders should operate permanently in a **synchronized and coordinated partnership**.

A **supportive institutional environment** includes: the improvement of education culture around its use, and supportive beliefs, values and attitudes in regard to AAC and

expected outcomes; improving information and communication technology (ICT) and didactic conditions to create, store, transmit and share materials, and tools when necessary; clear institutional definition of liability for using the C-board; **intersectional cooperation** between health, education and social institutions.

Conclusion

AAC enables children to develop their full communicative potential in a truly natural context in which they learn and play. The study suggests that weak collaboration between stakeholders is the main obstacle to establishing and developing AAC implementation in a wide social context for children with communicational disabilities in Serbia. The involvement of educators and educational institutions is a critical point of transfer from home and therapy sessions to a wide variety of environmental settings.

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References

Aldabas, R. (2021) Barriers and facilitators of using augmentative and alternative communication with students with multiple disabilities in inclusive education: special education teachers' perspectives, International Journal of Inclusive Education, 25:9, 1010-1026. https://doi.org/10.1080/13603116.2019.1597185

Andzik, N., Chung, Y-C., Doneski-Nicol, J., Dollarhide, C.T. (2019). AAC services in schools: A special educator's perspective. International Journal of Developmental Disabilities, 65(2), 89-97. https://doi.org/10.1080/20473869.2017.1368909

Berenguer, C., Martínez, E.R., De Stasio, S., and Baixauli, I. (2022). Parents' Perceptions and Experiences with Their Children's Use of Augmentative/Alternative Communication: A Systematic Review and Qualitative Meta-Synthesis. International Journal of Environmental Research and Public Health. Int. J. Environ. Res. Public Health, 19, 8091. https://doi.org/10.3390/ijerph19138091

Chung, Y. and Douglas, K. H. 2014. Communicative competence inventory: A team approach to AAC use. TEACHING Exceptional Children, 47, 56–68.

Golubović, Š., & Glumbić, N. (2020). Izveštaj o primeni C-boarda [Report on monitoring implementation of the Serbian C-board]. UNICEF.

Kovač Cerović, T., Pavlović Babić, D. Jovanović, O., Jovanović, V., Jokić, T., Rajović, V., Baucal, I. (2014): Okvir za praćenje inkluzivnog obrazovanja u Srbiji. UNICEF. Tim za socijalno uključivanje i smanjenje

siromaštva Vlade Republike Srbije. Institut za psihologiju Filozoskog fakulteta u Beogradu. Dostupno na: https://socijalnoukljucivanje.gov.rs/wp-content/uploads/2014/10/Okvir-za-pracenje-inkluzivnog-obrazovanja-u-Srbiji.pdf Pristupljeno 08.09.2022.

Moorcroft, A.; Scarinci, N.; Meyer, C. (2019). Speech pathologist perspectives on the acceptance versus rejection or abandonment of AAC systems for children with complex communication needs. *Augment. Altern. Commun. 2019, 35,* 193–204.

Vygotsky, L.S. (1978). *Mind in Society: Development of Higher Psychological Processes*. Harvard University Press. ISBN 9780674576292.

INVITED LECTURE

The Use of Transcranial Direct Current Stimulation (tDCS) in the Research of Cognitive Functions

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Abstract

The aim of this paper is to provide a brief overview of the use of one of the most utilized noninvasive brain stimulation technique, namely, transcranial direct current stimulation (tDCS), in studying cognitive functions. I focus on the behavioral effects of tDCS applied over central nodes of the frontoparietal network – the dorsolateral prefrontal cortex and posterior parietal cortex on associative memory, executive functions, and higher cognitive functions. The effectiveness of tDCS is discussed in the context of inconsistent findings often reported in the literature. Finally, I outline the limitations of the technique and further directions in the field of noninvasive brain stimulation.

Keywords: transcranial direct current stimulation (tDCS); dorsolateral prefrontal cortex (DLPFC); posterior parietal cortex (PPC); executive functions; cognitive abilities; associative memory

Noninvasive Brain Stimulation

Noninvasive brain stimulation (NIBS) is an innovative approach in neuroscience that allows for causal investigation of sensorimotor, cognitive, and affective brain functions and, ultimately, clinical treatment of a wide spectrum of neuropsychiatric conditions. The term refers to a set of technologies and techniques aimed at transcranial noninvasive modulation of neural excitability and activity of specific brain areas and inter-connected large-scale brain networks (Boes et al., 2018). The ability to directly affect brain activity enables causal inference about the neural underpinnings of cognitive functions. This makes NIBS a valuable tool for understanding cognitive functions on the neural level.

Transcranial Electric Stimulation

Here, I will focus on NIBS techniques that use an electric field to modulate brain activity – transcranial electric stimulation (tES). tES is an umbrella term for several brain stimulation methods that use low-intensity electrical currents (1-2 mA) to modulate brain activity. The most commonly used one is transcranial direct current stimulation (tDCS), which modulates neuronal excitability using anodal (positive) or cathodal (negative) stimulation and achieves its effects through depolarization or hyperpolarization of the resting membrane potential (Nitsche et al., 2008).

In cognitive experiments, tDCS can be applied in the so-called online or offline protocol, that is, during or after the cognitive task (see Bjekić et al., 2021 for typical tDCS setup and protocol). While the tDCS effects during stimulation are assumed to rely on increased or decreased neuronal likelihood to fire action potentials through depolarization or hyperpolarization of neuronal membranes, the after-effects are thought to be similar to long-term potentiation (LTP) and depression (LTD) and depend upon modulation of synaptic plasticity of glutamatergic and GABAergic interneurons, but acetylcholine, serotonin, and dopamine systems as well (Stagg & Nitsche, 2011).

Transcranial Direct Currents Stimulation and Cognitive Functions

tDCS showed promise for noninvasive neuromodulation of a variety of cognitive functions. When studying cognitive functions, the brain regions of interest are usually the dorsolateral prefrontal cortex (DLPFC) and posterior parietal cortex (PPC) as central stimulation-available nodes of the widely distributed frontoparietal neural network. Here I will provide a brief overview of the state-of-the-art in the field, with particular attention to the behavioral effects of tDCS applied over different brain loci within the frontoparietal network on associative memory, executive functions, and higher cognitive functions. I will focus on the effects of anodal tDCS, findings on healthy participants, and studies that used well-defined measures of cognitive functions.

Associative memory

Associative memory (AM) is an essential aspect of episodic memory, and the binding of previously unrelated pieces of information represents the core feature of AM. Since the hippocampus, as the central structure, underlying AM is not directly accessible for tES, choosing the right cortical target and showing function-specific effects can give insight into hippocampus-cortical pathways that underline AM. In contrast to the prefrontal tDCS effects, which resulted in mixed findings (Galli et al., 2019), positive function-specific effects of anodal tDCS on AM were recorded for the parietal cortex (Bjekić, Čolić, et al., 2019; Bjekić, Vulić, et al., 2019; Vulić et al., 2021). Furthermore, some findings suggest that AM enhancement induced in a single session of anodal tDCS shows a tendency to persist for up to 5 days (Bjekić, Vulić, et al., 2019). These findings highlight the role of parietal cortices in AM.

The tES also allows for exploring the functional significance of brain rhythms in cognitive functions. Namely, the role of theta oscillations (4-8 Hz) has been long implied as the "glue that binds memories" (Herweg et al., 2020). Some studies suggested that oscillatory protocols such as transcranial alternating current stimulation (tACS) could be superior to tDCS in the modulation of the AM, especially when stimulation is applied in theta-band frequency (Klink et al., 2020; Lang et al., 2019). Still, some

findings (Živanović et al., 2022) point to the comparable online effects of tDCS and oscillatory protocols applied at individual theta frequency (Bjekić, Paunovic, et al., 2022; Bjekić, Živanović, et al., 2022) on overall AM accuracy. However, the observed effects are found to vary depending on the memory demand. Namely, it was shown that tDCS is more beneficial for AM when the memory demand is relatively low, while theta-oscillating stimulation predominantly facilitates AM when the memory demand is high and more efficient encoding and/ or longer retention is needed (Živanović et al., 2022). These findings suggest that the facilitation of lower-level memory processes may be achieved through increasing excitability of the neural circuits at the place of application, while binding processes can be facilitated through entrainment of theta activity in the cortico-hippocampal network (Živanović et al., 2022).

Executive functions

Executive functions (EF) are thought to mainly rely on the prefrontal cortex – dorsolateral prefrontal cortex (DLPFC) in particular. Thus, previous studies aiming to modulate updating of information in working memory (WM) primarily focused on DLPFC. They showed WM enhancement following single-session of anodal tDCS over both left (e.g., Fregni et al., 2005; Zaehle et al., 2011) and right DLPFC (e.g., Stanković et al., 2021; Živanović et al., 2021). However, a number of studies using DLPFC areas as stimulation loci did not find tDCS effects on WM (e.g., Hill et al., 2017, 2018). A meta-analysis (Hill et al., 2016) found evidence for the effects of anodal tDCS over DLPFC for offline but not online protocols. In another meta-analysis, it was shown that anodal unilateral tDCS produced significant effects on updating tasks (Imburgio & Orr, 2018).

Neuroimaging studies show that the neural underpinnings of WM extend beyond the anterior brain areas and include PPC as one of the main neural nodes underlying WM (Owen et al., 2005). In line with that, we showed that PPC could be an effective cortical target for the tDCS-induced modulation of WM (Živanović et al., 2021).

Several brain areas critically involved in inhibitory control emerged as promising stimulation targets for this EF, namely, DLPFC, pre-supplementary motor area (pre-SMA), inferior frontal gyrus (IFG), anterior cingulate cortex (ACC), and orbitofrontal cortex (OFC). Some findings show that tDCS over left DLPFC effectively enhances inhibitory control (e.g., Jeon & Han, 2012); still, some studies did not find such effects (Baumert et al., 2020; Živanović, 2019). Meta-analytic evidence suggests that the stimulation of the right DLPFC does not affect inhibition; however, it shows the significant effects of tDCS over right IFG on response inhibition (Schroeder et al., 2020). Similarly, studies found evidence of the beneficial effects of tDCS over pre-SMA on response inhibition (e.g., Hsu et al., 2011; Yu et al., 2015). Moreover, some studies found that tDCS over ACC (To et al., 2018), as well as OFC (Ouellet et al., 2015), are efficient in modulating inhibitory control.

Similarly, as for WM, parietal brain areas were far less examined as potential cortical targets for modulating inhibition, despite converging evidence on their involvement in inhibitory control (Alvarez & Emory, 2006). For example, one of our studies found that stimulation over the right PPC has a facilitatory effect on inhibition of spatial information, while the same stimulation applied over the left PPC has no effect on inhibitory control (Živanović, 2019).

Only a few studies focused on the effects of tDCS on cognitive performance measured by typical shifting tasks, and the results are inconclusive. For example, one study showed that cross-hemisphere stimulation of left/right DLPFC can modulate switching performance (e.g., Leite et al., 2013); however, some studies did not find that unilateral tDCS over left or right DLPFC modulates task switching (Živanović, 2019). In addition, we did not find that tDCS over both left and right PPC is effective in modulating shifting performance (Živanović, 2019).

Higher cognition

Both EF and complex cognition largely rely on the same frontoparietal neural network (Jung & Haier, 2007). Although EF can be modulated by tDCS, studies rarely examine whether these effects translate to the more complex functions mimicking the psychometric relationship between EF and cognitive abilities.

In a study that simultaneously tested tDCS effects on both EF and performance on cognitive ability measures (Živanović, 2019), we found that tDCS significantly modulated cognitive performance on *Gf*, *Gv*, and *Gs* measures but not *Gc* measures. Furthermore, these findings were in line with the higher reliance of *Gf*, *Gv*, and *Gs* on EF, as evidenced by their relationships obtained on a psychometric level. Moreover, we found that tDCS effects on *Gv* and *Gs* measures are likely mediated by the facilitation of updating of representations in WM, suggesting a causal role of WM in these abilities. These findings show that tDCS can be a useful tool for studying not only EF but higher cognition too.

Limitations and Further Directions

Despite the immense potential of tDCS in studying neural underpinnings of cognition, the current state-of-the-art is far from conclusive. Additional evidence on the tDCS effects across different cortical areas is needed for memory, EF, and especially more complex cognitive functions. One of the main challenges in aggregating the existing evidence lies in the significant variability of stimulation parameters/ protocols, tasks, and experimental designs. Further limitations stem from the technique itself, as its focality, the duration of effects, and exact mechanisms in large neuronal populations are still not fully understood. To realize the full potential of NIBS as a tool in experimental cognitive neuroscience, systematic variation of stimulation parameters combined with a careful selection of outcome measures is needed.

References

Alvarez, J. A., & Emory, E. (2006). Executive Function and the Frontal Lobes: A Meta-Analytic Review. *Neuropsychology Review*, *16*(1), 17–42. https://doi.org/10.1007/s11065-006-9002-x

Baumert, A., Buchholz, N., Zinkernagel, A., Clarke, P., MacLeod, C., Osinsky, R., & Schmitt, M. (2020). Causal underpinnings of working memory and Stroop interference control: Testing the effects of anodal and cathodal tDCS over the left DLPFC. *Cognitive, Affective, & Behavioral Neuroscience*, *20*(1), 34–48. https://doi.org/10.3758/s13415-019-00726-y

Bjekić, J., Čolić, M. V., Živanović, M., Milanović, S. D., & Filipović, S. R. (2019). Transcranial direct current stimulation (tDCS) over parietal cortex improves associative memory. *Neurobiology of Learning and Memory*, *157*, 114–120. https://doi.org/10.1016/j.nlm.2018.12.007

Bjekić, J., Paunovic, D., Živanović, M., Stanković, M., Griskova-Bulanova, I., & Filipović, S. R. (2022). Determining the Individual Theta Frequency for Associative Memory Targeted Personalized Transcranial Brain Stimulation. *Journal of Personalized Medicine*, *12*(9), 1367. https://doi.org/10.3390/jpm12091367

Bjekić, J., Vulić, K., Živanović, M., Vujičić, J., Ljubisavljević, M., & Filipović, S. R. (2019). The immediate and delayed effects of single tDCS session over posterior parietal cortex on face-word associative memory. *Behavioural Brain Research*, *366*, 88–95. https://doi.org/10.1016/j.bbr.2019.03.023

Bjekić, J., Živanović, M., & Filipović, S. R. (2021). Transcranial Direct Current Stimulation (tDCS) for Memory Enhancement. *Journal of Visualized Experiments*, *175*, 62681. https://doi.org/10.3791/62681

Bjekić, J., Živanović, M., Paunović, D., Vulić, K., Konstantinović, U., & Filipović, S. R. (2022). Personalized Frequency Modulated Transcranial Electrical Stimulation for Associative Memory Enhancement. *Brain Sciences*, *12*(4), 472. https://doi.org/10.3390/brainsci12040472

Boes, A. D., Kelly, M. S., Trapp, N. T., Stern, A. P., Press, D. Z., & Pascual-Leone, A. (2018). Noninvasive Brain Stimulation: Challenges and Opportunities for a New Clinical Specialty. *The Journal of Neuropsychiatry and Clinical Neurosciences*, *30*(3), 173–179. https://doi.org/10.1176/appi.neuropsych.17110262

Fregni, F., Boggio, P. S., Nitsche, M., Bermpohl, F., Antal, A., Feredoes, E., Marcolin, M. A., Rigonatti, S. P., Silva, M. T. A., Paulus, W., & Pascual-Leone, A. (2005). Anodal transcranial direct current stimulation of prefrontal cortex enhances working memory. *Experimental Brain Research*, *166*(1), 23–30. https://doi.org/10.1007/s00221-005-2334-6

Galli, G., Vadillo, M. A., Sirota, M., Feurra, M., & Medvedeva, A. (2019). A systematic review and meta-analysis of the effects of transcranial direct current stimulation (tDCS) on episodic memory. *Brain Stimulation*, *12*(2), 231–241. https://doi.org/10.1016/j.brs.2018.11.008

Herweg, N. A., Solomon, E. A., & Kahana, M. J. (2020). Theta Oscillations in Human Memory. *Trends in Cognitive Sciences*, *24*(3), 208–227. https://doi.org/10.1016/j.tics.2019.12.006

Hill, A. T., Fitzgerald, P. B., & Hoy, K. E. (2016). Effects of Anodal Transcranial Direct Current Stimulation on Working Memory: A Systematic Review and Meta-Analysis of Findings From Healthy and Neuropsychiatric Populations. *Brain Stimulation*, *9*(2), 197–208. https://doi.org/10.1016/j.brs.2015.10.006

Hill, A. T., Rogasch, N. C., Fitzgerald, P. B., & Hoy, K. E. (2017). Effects of prefrontal bipolar and high-definition transcranial direct current stimulation on cortical reactivity and working memory in healthy adults. *NeuroImage*, *152*, 142–157. https://doi.org/10.1016/j.neuroimage.2017.03.001

Hill, A. T., Rogasch, N. C., Fitzgerald, P. B., & Hoy, K. E. (2018). Effects of single versus dual-site High-Definition transcranial direct current stimulation (HD-tDCS) on cortical reactivity and working memory performance in healthy subjects. *Brain Stimulation*, *11*(5), 1033–1043. https://doi.org/10.1016/j.brs.2018.06.005

Hsu, T.-Y., Tseng, L.-Y., Yu, J.-X., Kuo, W.-J., Hung, D. L., Tzeng, O. J. L., Walsh, V., Muggleton, N. G., & Juan, C.-H. (2011). Modulating inhibitory control with direct current stimulation of the superior medial frontal cortex. *NeuroImage*, *56*(4), 2249–2257. https://doi.org/10.1016/j.neuroimage.2011.03.059

Imburgio, M. J., & Orr, J. M. (2018). Effects of prefrontal tDCS on executive function: Methodological considerations revealed by meta-analysis. *Neuropsychologia*, *117*, 156–166. https://doi.org/10.1016/j.neuropsychologia.2018.04.022

Jeon, S. Y., & Han, S. J. (2012). Improvement of the Working Memory and Naming by Transcranial Direct Current Stimulation. *Annals of Rehabilitation Medicine*, *36*(5), 585. https://doi.org/10.5535/arm.2012.36.5.585

Jung, R. E., & Haier, R. J. (2007). The Parieto-Frontal Integration Theory (P-FIT) of intelligence: Converging neuroimaging evidence. *Behavioral and Brain Sciences*, *30*(2), 135–154. https://doi.org/10.1017/S0140525X07001185

Klink, K., Peter, J., Wyss, P., & Klöppel, S. (2020). Transcranial Electric Current Stimulation During Associative Memory Encoding: Comparing tACS and tDCS Effects in Healthy Aging. *Frontiers in Aging Neuroscience*, *12*, 66. https://doi.org/10.3389/fnagi.2020.00066

Lang, S., Gan, L. S., Alrazi, T., & Monchi, O. (2019). Theta band high definition transcranial alternating current stimulation, but not transcranial direct current stimulation, improves associative memory performance. *Scientific Reports*, *9*(1), 8562. https://doi.org/10.1038/s41598-019-44680-8

Leite, J., Carvalho, S., Fregni, F., Boggio, P. S., & Gonçalves, Ó. F. (2013). The Effects of Cross-Hemispheric Dorsolateral Prefrontal Cortex Transcranial Direct Current Stimulation (tDCS) on Task Switching. *Brain Stimulation*, *6*(4), 660–667. https://doi.org/10.1016/j.brs.2012.10.006

Nitsche, M. A., Cohen, L. G., Wassermann, E. M., Priori, A., Lang, N., Antal, A., Paulus, W., Hummel, F., Boggio, P. S., Fregni, F., & Pascual-Leone, A. (2008). Transcranial direct current stimulation: State of the art 2008. *Brain Stimulation*, *1*(3), 206–223. https://doi.org/10.1016/j.brs.2008.06.004

Ouellet, J., McGirr, A., Van den Eynde, F., Jollant, F., Lepage, M., & Berlim, M. T. (2015). Enhancing decision-making and cognitive impulse control with transcranial direct current stimulation (tDCS) applied over the orbitofrontal cortex (OFC): A randomized and sham-controlled exploratory study. *Journal of Psychiatric Research*, *69*, 27–34. https://doi.org/10.1016/j.jpsychires.2015.07.018

Owen, A. M., McMillan, K. M., Laird, A. R., & Bullmore, E. (2005). N-back working memory paradigm: A meta-analysis of normative functional neuroimaging studies. *Human Brain Mapping*, *25*(1), 46–59. https://doi.org/10.1002/hbm.20131

Schroeder, P. A., Schwippel, T., Wolz, I., & Svaldi, J. (2020). Meta-analysis of the effects of transcranial direct current stimulation on inhibitory control. *Brain Stimulation*, *13*(5), 1159–1167. https://doi.org/10.1016/j.brs.2020.05.006

Stagg, C. J., & Nitsche, M. A. (2011). Physiological Basis of Transcranial Direct Current Stimulation. *The Neuroscientist*, *17*(1), 37–53. https://doi.org/10.1177/1073858410386614

Stanković, M., Živanović, M., Bjekić, J., & Filipović, S. R. (2021). Blinding in tDCS Studies: Correct End-of-Study Guess Does Not Moderate the Effects on Associative and Working Memory. *Brain Sciences*, *12*(1), 58. https://doi.org/10.3390/brainsci12010058

To, W. T., Eroh, J., Hart, J., & Vanneste, S. (2018). Exploring the effects of anodal and cathodal high definition transcranial direct current stimulation targeting the dorsal anterior cingulate cortex. *Scientific Reports*, *8*(1), 4454. https://doi.org/10.1038/s41598-018-22730-x

Vulić, K., Bjekić, J., Paunović, D., Jovanović, M., Milanović, S., & Filipović, S. R. (2021). Theta-modulated oscillatory transcranial direct current stimulation over posterior parietal cortex improves associative memory. *Scientific Reports*, *11*(1), 3013. https://doi.org/10.1038/s41598-021-82577-7

Yu, J., Tseng, P., Hung, D. L., Wu, S.-W., & Juan, C.-H. (2015). Brain stimulation improves cognitive control by modulating medial-frontal activity and preSMA-vmPFC functional connectivity: Brain Stimulation Improves Cognitive Control. *Human Brain Mapping*, *36*(10), 4004–4015. https://doi.org/10.1002/hbm.22893

Zaehle, T., Sandmann, P., Thorne, J. D., Jäncke, L., & Herrmann, C. S. (2011). Transcranial direct current stimulation of the prefrontal cortex modulates working memory performance: Combined behavioural and electrophysiological evidence. *BMC Neuroscience*, *12*(1), 2. https://doi.org/10.1186/1471-2202-12-2

Živanović, M. (2019). *Efekti transkranijalne neuromodulacije fronto-parijetalne funkcionalne mreže na više kognitivne funkcije* (*The effects of transcranial neuromodulation of fronto-parietal functional network on higher cognitive functions*). [Doctoral dissertation, Faculty of Philosophy, University of Belgrade].

Živanović, M., Bjekić, J., Konstantinović, U., & Filipović, S. R. (2022). Effects of online parietal transcranial electric stimulation on associative memory: A direct comparison between tDCS, theta tACS, and theta-oscillatory tDCS. *Scientific Reports*, *12*(1), 14091. https://doi.org/10.1038/s41598-022-18376-5

Živanović, M., Paunović, D., Konstantinović, U., Vulić, K., Bjekić, J., & Filipović, S. R. (2021). The effects of offline and online prefrontal vs parietal transcranial direct current stimulation (tDCS) on verbal and spatial working memory. *Neurobiology of Learning and Memory*, *179*, 107398. https://doi.org/10.1016/j.nlm.2021.107398