PROCEEDINGS OF THE
XXIX SCIENTIFIC CONFERENCE

EMPIRICAL STUDIES IN PSYCHOLOGY

MARCH 31ST – APRIL 2ND, 2023
FACULTY OF PHILOSOPHY, UNIVERSITY OF BELGRADE

INSTITUTE OF PSYCHOLOGY
LABORATORY FOR EXPERIMENTAL PSYCHOLOGY
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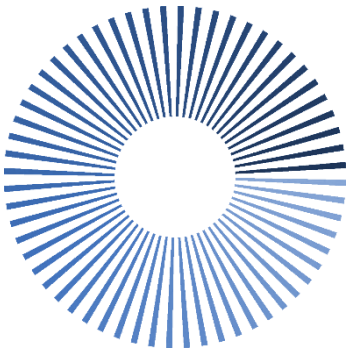

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Deprez time-marker (G. Boulitte, Paris)

Device for setting a fine time base for kymographic recording. It provides oscillations for intervals down to 0.005 sec. A pen is attached to the plunger of an electromagnet. The movements of the plunger may be varied with a conical regulator. The device now lacks the pen. The author of this device is French electrical engineer Marcel Deprez who conducted the first experiments to transmit electrical power (DC) over long distances. Dimensions: 18.5 x 4 x 4.5 cm; Net weight; 145 g; Voltage: V DC = 2 – 4 V

From the collection of old scientific instruments of the Laboratory of Experimental Psychology, Faculty of philosophy, University of Belgrade

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Task Dependency of Color-Shape Associations

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Abstract

Previous studies observed stimulus-dependent associations between color and shape characteristics in color-shape matching tasks (Dreksler & Spence, 2019; Malfatti, 2014). This study investigated these associations in a 2AFC task (E1) and a rating scale task (E2). Stimuli consisted of pairs of pointed and round abstract shapes uniform in size. Colors were chosen from the Munsell system – two warm hues (R, Y) and two cool hues (G, B) on two lightness levels with constant saturation. In E1, participants chose the preferred shape for a given color, and in E2, they rated their preference for each color-shape combination on a 7-point rating scale. Results showed a general preference toward round shapes: they were chosen more often and got higher ratings. The results regarding color-shape associations pointed to a task-dependent preference - pointed shapes were chosen more often in darker shades (E1) but got higher ratings when presented in lighter shades (E2). We found no association between color "temperature" and shape pointedness, however, pointed shapes were chosen more often in dark red than in light red hues, which aligns with some previous findings (Malfatti, 2014). Our results show that color-shape associations are both stimulus-dependent and task-dependent and support the notion that intramodal associations should be interpreted carefully, considering the applied methodology.

Keywords: intramodal associations; color-shape associations; task dependency

Introduction

Wassily Kandinsky proposed universal associations between primary shapes and colors: *yellow* and *triangle*, *blue* and *circle*, and *red* and *square* (Kandinsky, 1914). Subsequent studies failed to replicate the universality of these associations (Dumitrescu, 2003); however, his work inspired a line of research that focused on intramodal correspondence between *characteristics* of colors and geometric and abstract shapes (e.g., "temperature"; lightness; pointedness) (Albertazzi et al., 2013; Chen et al., 2015; Dreksler & Spence, 2019; Malfatti, 2014).

Despite these studies reporting significant color-shape associations, their findings were inconsistent. For example, the red hue was associated with pointed shapes in one study (Malfatti, 2014) and with round ones in a subsequent study (Dreksler & Spence, 2019). However, both studies used the same color-shape matching task in which participants had to choose a color for a specific shape.

The inconsistency in obtained results could be partially explained by the fact that these studies used different sets of colors and shapes and included a significant number of their characteristics (e.g., redness, lightnes, complexity, symmetry-axes). Overall, results indicated that color-shape associations are complex, moderated by various factors, and dependent on the used set of stimuli.

In this study, we aimed to further examine the intramodal color-shape correspondence across two different experimental *tasks*, specifically, the ones that could provide repeated measures – a two-alternative forced-choice task (2AFC) and a rating scale task. To better understand the potential associations, we focused on a smaller number of characteristics – "*temperature"* and *lightness* for color and *pointedness* for shape. We also decided to use abstract shapes to minimize the influence of culture.

Method

Sample

The convenient sample consisted of 68 participants (29m) in E1 and 68 participants (24m) in E2. Participants signed informed consent for participation and had normal or corrected to normal vision without any color vision deficiency.

Design and Procedure

We selected colors from the Munsell color space. Colors varied by "temperature" with cool hues – green (2.5G, 5G, 7.5G) and blue (2.5B, 5B, 7.5B) and warm hues – red (2.5R, 5R, 7.5R) and orange (2.5YR, 5YR, 7.5YR). Colors were presented on two lightness levels (V = 4, 6) with constant saturation (C = 14). We created four pairs of abstract shapes uniform in size. Each pair consisted of one round and one pointed shape with the same number of protrusions (7, 8, 9, or 10), which varied solely for the purpose of creating a more extensive set of stimuli.

In E1, the two simultaneously presented stimuli were uniform in color and the number of protrusions but differed in pointedness. In a 2AFC task, participants had to choose the preferred color-shape combination. The dependent variable was the percentage of pointed shape choices. In E2, each

stimulus was presented individually, and participants had to determine the likeability of the presented color-shape combination on a 7-point Likert scale. The dependent variable was the average rating. Task procedures are illustrated in Figure 1.

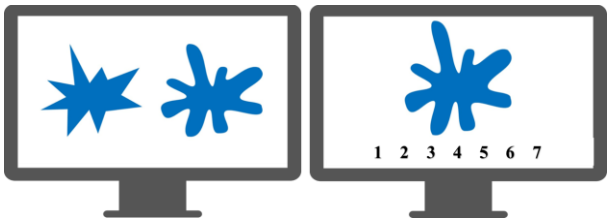

Figure 1. *Task procedures (E1; E2).*

Results

In both experiments, we observed a preference for round shapes – in E1, they were chosen in 66.2% of cases, and in E2, they got significantly higher ratings ($F(1,66) = 31.2$, $p = .00$; $\eta 2 = .32$).

Furthermore, lightness had the opposite effects across two tasks: in E1, pointed shapes were chosen more often when presented in dark colors ($F(1,66) = 3.73$, $p = .05$; $\eta 2 = .07$). However, in E2, LSD post hoc showed that dark pointed shapes were rated lower than light pointed ($p = .01$), dark round ($p < .01$) and light round ones ($p < .01$), while for round shapes there was no difference as to lightness ($F(1,66) = 5.34$, $p = .02$; $\eta 2 = .07$; Figure 2).

We also observed several gender effects. Firstly, male participants chose pointed shapes more often than females in E1 ($F(1,66) = 4.46$, $p = .03$; $\eta 2 = .06$). Secondly, in E2, we observed a lightness-"temperature"-gender interaction ($F(1,66) = 4.55$, $p = .03$; $\eta 2 = .06$; Figure 3). Male participants gave higher ratings to cool than warm hues, regardless of lightness. Fisher LSD suggested significant differences between dark cool and both dark and light warm tones ($p < .01$, $p < .01$, respectively), as well as light cool compared to light warm ($p < .01$). On the other hand, for females, the lightness changed the trend of grading warm hues – light warm hues were rated higher than dark warm hues ($p < .01$).

Since we did not observe any significant association between shape pointedness and color "temperature", we additionally performed an analysis by separate hues. In E1, we observed marginally significant lightness-hue interaction – pointed shapes were chosen more often in dark than in light red shades ($F(3, 198) = 2.45$, $p = .06$; $\eta 2 = .03$; LSD: $p < .01$). In E2, we observed females' preference for the red hue ($F(3, 198) = 2.73$, $p = .04$; $\eta 2 = .03$) – they gave higher ratings to red shapes in relation to males ($p = .03$) but also in relation to the other hues (blue, $p = .01$; green, $p < .01$; orange, $p < .01$).

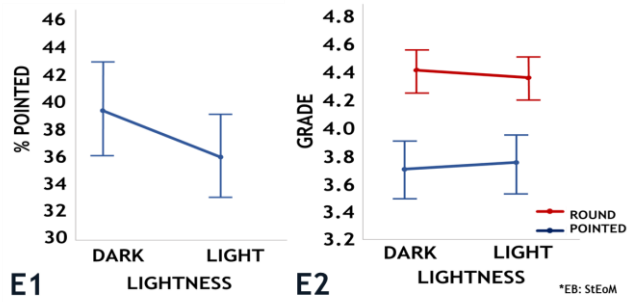

Figure 2. *Lightness effects in E1 (left) and E2 (right).*

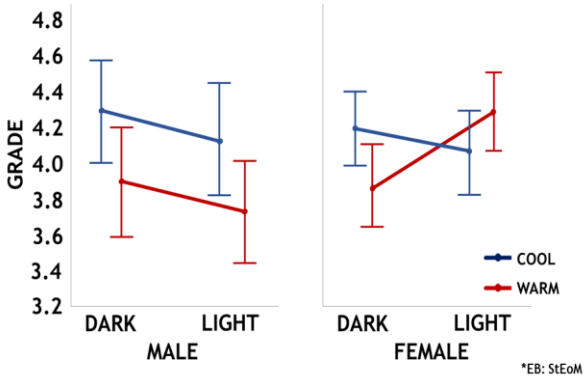

Figure 3. *Lightness-"temperature"-gender interaction in E2.*

Discussion

The only stable tendency observed across both experiments was a general preference toward round shapes, well known from previous studies (Bertamini et al., 2016). There are numerous explanations for this relatively stable effect – from curve being preferred because it is a better Gestalt (Kanizsa, 1979) to angular being avoided because it is associated with a sense of threat (Bar & Neta, 2006).

Color-shape characteristics associations investigated in this study turned out to be unstable. The effects were either contradictory or not observed in one of the tasks which is in line with previous studies reporting numerous moderating factors (e.g., sample or stimuli characteristics, such as distribution or concavity; Malfatti, 2014).

We did not observe any significant effect of color "temperature" reported in some previous studies (Chen et al., 2015). However, we did observe a particular association between pointed shapes and red hue which aligns with Malfatti's results (2014) and could be explained by semantic associations between pointed shapes and red hues with concepts of agency and power (Meier, 2012; Stroessner et al., 2020).

Our results showed a gender difference in shape preference: males chose pointed shapes more often than females in E1. Some previous findings suggest semantic associations between pointed and round shapes with masculine and feminine concepts, respectively (Stroessner et al., 2020). However, we did not observe a similar pattern of results in E2, so more investigation is needed.

Male participants in our study showed a preference for cool hues, while females showed a preference for red hues. These gender-related differences are known from previous studies and could be explained by the gender-specific uses of trichromacy during evolution (Hurlbert & Ling, 2007). Namely, it is assumed that the female brain has been specialized for gathering and caregiving tasks, i.e., honed to identify reddish hues (e.g., berries and emotionally triggered skin tone changes).

To conclude, our findings support the notion that color-shape associations are complex and show they are not only stimulus-dependent, as shown in previous research (Dreksler & Spence, 2019), but task-dependent as well. This means that future studies need to interpret any observed effect considering the methodology applied. More importantly, task-related differences possibly reflect different levels of processing or at least different response strategies (see Palumbo & Bertamini, 2016), so their further investigation can contribute to a better understanding of mechanisms underlying color-shape associations.

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Relations Between Arousal, Abstractness, and Familiarity of Words and their Associative Fields in Different Age Groups

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Abstract

The aim of this study was to examine relation between connotative meaning of words and connotative meaning of their associative fields in participants from four age groups (5-, 9-, 13- and 17-year-olds). Forty nouns and their associative fields (twenty most frequent associations) were selected from Developmental associative dictionary of Serbian language and rated on arousal (impressiveness), abstractness and familiarity scales. The results showed statistically significant positive correlations between arousal, abstractness and familiarity of stimuli-words and average arousal, abstractness and familiarity of their associative fields in all four age groups. Further analysis showed that a significant percentage of variance of connotative meaning of stimuli-words could be explained by the connotative meaning of their associative fields in all four age groups. Additional analysis showed no statistically significant differences in the strength of association of stimuli-words and their associative fields between different age groups. These results are in line with the Associative hypothesis of connotative meaning formation, which suggests that the connotative meaning of words depends on the connotation of the words that make up their associative fields.

Keywords: connotative meaning; arousal; abstractness; familiarity; associative fields

Introduction

Connotative meaning represents one of the key dimensions of meaning. However, despite the large number of research conducted in recent decades, we still do not know what mechanisms are at the basis of the formation of the connotative meaning of words.

The question of the relationship between the connotative meaning of a word and the connotative meaning of its associates is important because it can give us a deeper insight into the nature and origin of the connotative dimension of meaning. According to *Associative hypothesis in the formation of connotative meaning* the connotative meaning of a word depends on the connotation of the meanings associated with it, i.e., on the connotative meaning of the words that form its associative field (Mađarev & Janković, 2021).

Previous study that analyzed relation between affective valence (pleasantness), arousal (impressiveness) and cognitive evaluation (familiarity and abstractness), of words and connotative meaning of their associative fields in the adults, suggested strong relationship between connotation of words and their associative fields (Janković, 2000a; Mađarev & Janković, 2021). Also, previous study focusing on the affective valence (Mađarev et al., 2021) suggested a strong relationship between the valence of words and the valence of associations from their associative fields in different age groups that stayed constant during development (correlation was above r=.92 at all tested ages from 5 to 17 years old).

The aim of this study was to analyze the relation between connotative meaning of words (arousal, familiarity and abstractness) and connotative meaning of their associative fields in four age groups (5-, 9-13- and 17-year-olds).

Method

Participants

Forty-nine students from the Department of Psychology, University of Belgrade took part in this study as a part of course requirement (85.7% female, M_{age} = 19.2; SD = 1.08).

Stimuli

Two databases were used to select stimuli for this study: the Developmental associative dictionary of Serbian language (Janković, 2010; Janković & Jakić Šimšić, 2021), from which the 40 stimuli words and 20 most frequent associations from their associative fields were selected, and the Affective norms for Serbian words (ANSW) from which affective norms for those words were extracted (Janković, 2000b; Mađarev & Janković, 2021). Out of 840 words that were used in the study (40 nouns for stimuli words and 800 associates), affective norms for 430 were taken from ANSW database, and for the remaining 410 words, affective ratings were collected as part of this study.

Procedure

Forty-nine participants rated impressiveness (arousal), familiarity and abstractness (cognitive evaluation) of remaining 410 words on seven-point bipolar scales presented on computer screen using Qualtrics software. Words were presented in a randomized order for each participant in groups of 15 words.

Results

In order to measure the impressiveness, familiarity and abstractness of associative fields, we calculated average ratings of twenty most frequent associates for each word

separately, and for each age group. Twenty most frequent associations comprise almost half of all associations generated for a word. The correlations between the same dimensions of connotative meaning of stimuli words and connotative meaning of their associative fields were calculated for each age group separately. The results showed that impressiveness and abstractness of stimuli words and their associative field were highly correlated in all age groups, while familiarity of a stimuli words and their associative fields were moderately correlated in all age groups (Figure 1).

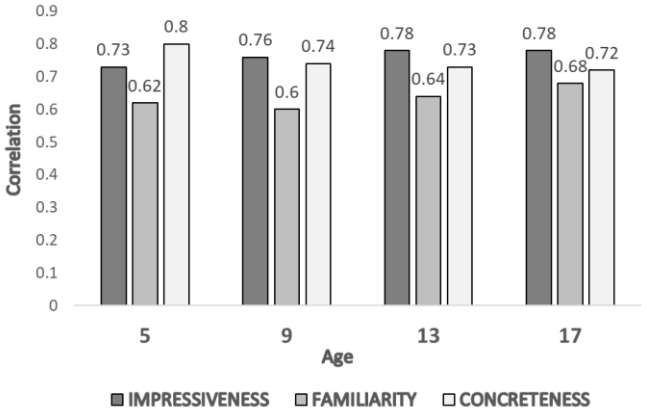

Figure 1: Correlation between the impressiveness, familiarity and concreteness of stimuli words and the impressiveness, familiarity and concreteness of their associative fields in different age groups

All correlations between the impressiveness of stimuli words and the impressiveness of their associative fields were high and statistically significant: $r(38)=.73$, $p<.01$, $r(38)=.76$, $p<.01$, $r(38)=.78$, $p<.01$, $r(38)=.78$, $p<.01$ for the 5-, 9-, 13- and 17-year-olds, respectively. Correlations between the abstractness of stimuli words and the abstractness of their associative fields were also high and statistically significant: $r(38)=.80$, $p<.01$, $r(38)=.74$, $p<.01$, $r(38)=.73$, $p<.01$, $r(38)=.72$, $p<.01$ for the 5-, 9-, 13- and 17-year-olds, respectively. Correlations between the familiarity of stimuli words and the familiarity of their associative fields were moderate and statistically significant: $r(38)=.62$, $p<.01$, $r(38)=.60$, $p<.01$, $r(38)=.64$, $p<.01$, $r(38)=.68$, $p<.01$ for the 5-, 9-, 13- and 17-year-olds, respectively. Additional analysis showed no statistically significant differences in the strength of relation between connotative meaning of stimuli-words and connotative meaning of their associative fields in different age groups.

In addition, linear regression analysis showed that the impressiveness (arousal), abstractness and familiarity (cognitive evaluation) of the associative fields can explain a significant percentage of variance in the impressiveness, abstractness and familiarity of the stimuli words in all four age groups (Table 1).

Table 1: Proportion of the variance in the connotative meaning of words that is predictable from the connotative meaning of their associative fields (R^2).

	R^2	$F(1,38)$	p
Age 5			
Impressiveness	,54	42,8	<0,01
Familiarity	,39	23,92	<0,01
Abstractness	,65	70,06	<0,01
Age 9			
Impressiveness	,58	52,46	<0,01
Familiarity	,38	21,99	<0,01
Abstractness	,55	46,12	<0,01
Age 13			
Impressiveness	,60	58	<0,01
Familiarity	,41	26,48	<0,01
Abstractness	,54	44,71	<0,01
Age 17			
Impressiveness	,60	58,97	<0,01
Familiarity	,47	33,66	<0,01
Abstractness	,51	39,99	<0,01

Discussion and Conclusions

The aim of this study was to analyze the relation between connotative meaning of words and connotative meaning of their associative fields in different age groups. The results showed statistically significant positive correlations between arousal, familiarity and abstractness of stimuli-words and the average arousal, familiarity and abstractness of their associative fields in all four age groups. In other words, in all age groups the associative fields of abstract words consist predominantly of associations that are also abstract, and the associative fields of words with concrete meaning consists of associations that are themselves predominantly concrete. Similarly, strongly arousing stimuli-words for associations have words that evoke greater arousal, and more familiar words generally have more familiar associations in their associative fields and vice versa. Moderate correlation between the familiarity of stimuli words and the familiarity of their associative fields in this study should be viewed with some caution, as the most frequent associations are usually words that are more familiar.

These findings are in line with the Associative hypothesis of connotative meaning formation, which suggests that the connotative meaning of words depends on the connotation of the words that constitute their associative fields (Mađarev & Janković, 2021). Similarly, the results of previous studies that used stimuli from other domains and sensory modalities suggested that this phenomenon goes beyond the domain of language. For example, piecemeal-based evaluation theory of attitude formation states that our attitude toward something is formed on the basis of the affective experience of individual features that we attribute to those objects or persons (Fiske & Neuberg 1990; Pavelchak, 1989). Also, according to VACe model of aesthetic experience, affective

experience of any sensory stimulus (e.g., painting, music) is result of the affective experience of all meanings (associations) activated in the mind of the beholder during the observation of that stimulus (Janković, 2014).

Another important finding from this study is that there are no statistically significant differences in the strength of the associations between connotative meaning of words and connotative meaning of their associative fields in different age groups. Despite the fact that the structure and content of associative fields changes with age, the strength of the relationship between the connotative meaning of words and their associative fields remains practically the same at the ages of 5 to 17 years. This finding suggests a very early development (before the age of five) as well as the stability of this phenomenon during childhood and adolescence until adulthood.

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Using Italic in Two Serbian Alphabets

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Abstract

The main goal of this study was to examine the effect of visual salience on the processing of Latin and Cyrillic words. Different typographies are used that can enhance visual saliency, but we focused on italic because some authors consider this typeface is an integral part of Latin-script typographic culture (Gaultney, 2021). The specificity of the Serbian language orthography is reflected in the phenomenon of synchronous digraphia, which represents the parallel use of two scripts - Latin and Cyrillic. So, this research can contribute to new knowledge about this phenomenon. The sample consisted of 55 students. The lexical decision task was used in which in which three factors were varied – lexicality (word and pseudoword), alphabet (Latin and Cyrillic) and typeface (normal and italic). The obtained results show that there is a main effect of the lexicality and alphabet on processing speed. The typeface effect was also statistically significant and statistically significant interaction between the various factors was also obtained. It can be concluded that typographic features are important during visual word recognition and this effect is not the same in the two alphabets of the Serbian language.

Keywords: visual saliency, italic typeface, Serbian Cyrillic, Serbian Latin

Introduction

Prominence or salience of an object in visual perception is used as a term to "describe the aspects of that object that distinguish it from neighboring objects" (Menon & Uddin, 2010). Visual salience plays an important role in the written text because it completes the statements in the text and gives them an additional dimension that is often difficult to transfer into the text by transcribing live speech. Visual salience is the most valuable paralinguistic aspect introduced into the text (Lemarie et al., 2008) and it affects the recognition of isolated letters (Pelli et al., 2006) as well as the recognition of words (Macaya & Perea, 2014; Perea & Rosa, 2002). Many studies have shown that visually salient parts of the text attract the attention of respondents (Yeari et al., 2017, Wu et al., 2021). Also, research shows that such a text is processed more successfully, and that the trace that remains after the processing process is more permanent (Diemand-Yauman et al., 2010; Yeari et al., 2016). The sustainability of that trace is most often explained by the strong semantic meaning that a part of the text carries, and sometimes it is explained by the longer and cognitively more demanding processing that the modified text requires. Visual salience can be achieved in different ways, through bolding, underlining, spaces between letters, coloring the text or using different fonts or italic style. Regardless of which method is used, the effects are generally the same - increasing the visual appeal of the text, but also increasing the readability of the text and facilitate its processing.

The specificity of the Serbian language orthography is reflected in the phenomenon of synchronous digraphia, which represents the parallel use of two alphabets - Latin and Cyrillic. Findings from previous studies showed differences in readability of these alphabets (Ognjenović, Škorc, & Morača, 1995; Vejnović & Jovanović, 2012). In those studies, aspects of the visual representation of words were not varied, so the main goal of this study was to examine the effect of visual salience on the processing of Latin and Cyrillic words. Different typographies are used that can enhance visual saliency, but we focused on italic because some authors consider this typeface is an integral part of Latin-script typographic culture (Gaultney, 2021).

Method

Sample

The sample consisted of 55 students from the University in Banja Luka, age 19 to 23. The respondents voluntarily participated in the experiment after being informed about the purpose of the research. The criteria for participation in the experiment were:

- knowledge of both alphabets
- the first learned alphabet was Cyrillic
- lack of preference towards one letter in reading and writing

Design and Procedure

Three factors were varied in the experiment – *lexicality* (word and pseudoword), *alphabet* (Latin and Cyrillic) and *typeface* (normal and italic). Lexicality was within-subject factor and alphabet and typeface were between-subject factors. Although we have three factors in the experiment, our work is primary concerned with processing of words in text, we treat the factor of lexicality only as method to make the participants do the experimental task (lexical decision). We focused our analysis only on words and the interaction between alphabet and typeface. The lexical decision task was used in which stimuli were 6-characters long words and pseudowords (masculine nouns), written in lowercase in Arial font 48. Reaction time and number of errors were measured as dependent variables.

Figure 1: Examples of stimuli in the experiment.

Results

The obtained results show that there is a main effect of script on processing speed. Latin stimuli are processed faster than Cyrillic ($F(1,3296)=10.910$, $p<.01$, $\eta^2=.003$). The typeface effect was also statistically significant ($F(1,3296)=57.160$, $p<.001$, $\eta^2=.017$). A statistically significant interaction between the various factors was also obtained ($F(1,3296)=103.168$, $p<.001$, $\eta^2=.030$) and it explains the largest percentage of variance. Italic stimuli in the Latin alphabet are processed faster than normal ones (37.55ms, (95% CI, 0.54ms to 74.50ms), p=.047), while the opposite effect was obtained in the Cyrillic alphabet (-256.21ms, (95% CI, -299.56ms to -212.86ms), p=.000). Italic word written in Cyrillic are processed significantly slower than normal words (Figure 2).

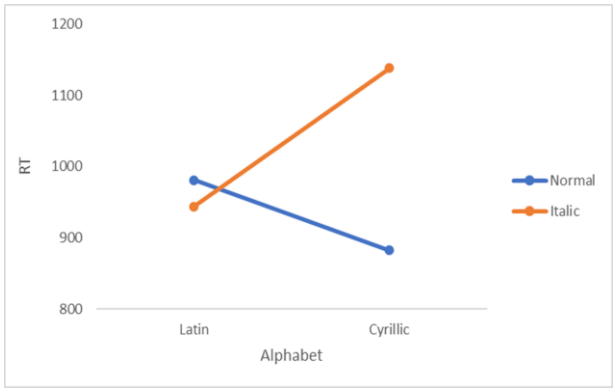

Figure 2: Reaction time in relation to alphabet and typeface

Discussion and Conclusion

Texts are a form of written communication, but at the same time they are also complex visual stimuli. Effective visual processing of these stimuli represents the beginning of the reading process, which again includes a series of cognitive processes. Therefore, it is very important to study the visual aspects of the written form of expression. The perceptual quality that makes certain segments of the text more visually attractive and noticeable is visual salience. Visual salience can be achieved by varying various typographic features such as font type, font size, italic, bold, underline, and others. Considering that the phenomenon of digraphia is present in the Serbian language, which implies the equal use of Latin and Cyrillic alphabets, it is of particular importance to study the effects of the aforementioned characteristics on the processing and readability of the text in two alphabetic systems.

The main goal of this research was to examine the effect of one typographic feature, italics, on the speed of processing Latin and Cyrillic words in a lexical decision task. Italics are most often used to emphasize part of the text, create contrast or increase visual interest in the text. Italics are often used to increase the visual attractiveness of the text, its elegance and sophistication (Dyson & Beier, 2016). Italics can affect the readability of text depending on how it is used. When used for short pieces of text, it makes it easier to read because it draws the reader's attention. But using it for long paragraphs or the whole text can have a negative effect and make reading difficult because it disrupts the natural flow of reading due to slanted letters.

The results in this research show that the use of italics in the Latin alphabet speeds up processing compared to normal letters. But the use of italics in the Cyrillic alphabet made processing more difficult and slowed down the reaction time. The different effect of the same typographic feature could indicate the visual difference of the letters in the two alphabets in the Serbian language, as well as their complexity, and this could affect further processes of processing written words and readability.

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Exploration of the Latent Space of Five Scales For Testing the Vividness of Mental Visualization

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Abstract

This research aimed to explore the latent space of five questionnaires that measure different aspects of mental imagery. Mental visualization is a fundamental cognitive process in everyday functioning, motor action, and performance. In foreign studies, these questionnaires are used to match participants according to MV ability. However, there are no vividness questionnaires translated into Serbian. Thus, we translated the most cited questionnaires. Each scale captures different aspects of the vividness of MV: visual (VVIQ), motor (VMIQ), imagery in different sensory modalities (Psi-Q), and imagery of specific shapes (SQ). Only SUIS measures the use of MV in everyday life. A total number of 331 psychology students filled out the questionnaires. The principal component analysis extracted three components: multimodal, visual, and scale-specific components. The multimodal component was saturated with all subscales from the Psi-Q scale except the visual, which correlated with the second visual component. The visual component captured VVIQ, VMIQ, and SUIS scores, while the third component gathered SQ scales. The SQ scale measures the ability to imagine specific shapes - participants must hold the images in short-term memory, while in other scales, they must recall images from episodic memory. The results indicate that individuals could be differentiated by factor scores on these components. However, the questionnaires should be administered to various professionals, like artists, athletes, or engineers.

Keywords: mental visualization, vividness of mental imagery, questionnaires, principal component analysis

Mental visualization

Mental visualization (MV) is a key cognitive function that helps us in everyday functioning, such as motivation or problem-solving. It is a fundamental cognitive process for executing motor actions and performance (Cumming & Williams, 2012). Many studies using neuroimaging techniques have shown that the same brain areas are active during imagining the execution of specific movements as during the actual execution (e.g., Sharini et al., 2021). Its primary function is to assist in the self-regulation of thoughts, emotions, and behaviors (Cumming & Williams, 2012), and clinical psychologists use it as a technique in therapeutic processes (Skottnik & Linden, 2019). However, it is most extensively studied in sports psychology and is widely accepted as a technique among dancers and athletes (Blankert & Hamstra, 2017; Cumming & Williams, 2012; Smith et al., 2007).

MV is a top-down process, which means it retrieves information from long-term memory into working memory to either recall or create a new experience (Cumming & Williams, 2012). Therefore, visualization is dynamic, involving other cognitive processes like memory. Furthermore, MV is considered a quasi-sensory process, similar to perception, as it occurs without external stimulus. Additionally, it is not limited to past information but allows individuals to create new experiences that have not yet occurred (Cumming & Williams, 2012). MV has several different aspects, according to Kosslyn's model, including generation, maintenance, and mental rotation (Kosslyn, 1980; Dean & Morris, 2003). The vividness of mental imagery represents only one of the numerous aspects or attempts to measure the ability of mental visualization (Andrade et al., 2013), referring to how rich and vivid the images are that the participant conjures in their consciousness, visualized in their "mind's eye" (Andrade et al., 2013). It is also used in research to match participants based on their ability for MV.

Our goal was to explore the latent space of five different MV scales and determine if common dimensions can describe them. Additionally, we examined whether participants differ in the vividness of MV. To differentiate

between students, we considered their hobbies. We hypothesized that individuals oriented towards art would exhibit a higher level of vividness in mental imagery compared to students without hobbies or with hobbies different than arts. We applied the same hypothesis to students involved in sports, as mental visualization is crucial for athletes.

Method

Participants

A total number of 331 psychology students from the Faculty of Media and Communications, Singidunum University, participated in the study. The average age was 22 (SD=5.7) years (78% female). All were Serbian native speakers.

Instruments

The Vividness of Visual Imagery Questionnaire (VVIQ) measures the vividness of mental images (Marks, 1973) and consists of 16 items (e.g., *Imagine the sun rising*). Participants had to answer on a five-point descriptive scale to what extent the mental image is like a real one. The answering scale is reverted, meaning "1" denotes the largest vividness.

The Vividness of Motor Imagery Questionnaire (VMIQ) measures the vividness of motor imagery (Isaak et al., 1986), specifically the vividness of body movements' images from a first-person and third-person perspective. Therefore, it consists of two scales of 16 items, one for the first and the other for the third perspective. (e.g., *Imagine oneself or someone else slipping backward*). The answering scale is the same as for VVIQ.

The Plymouth Sensory Imagery Questionnaire (Psi-Q) measures the vividness of mental images in various sensory modalities (visual, tactile, gustatory, auditory, and olfactory modality, plus interoception and emotions; Andrade et al., 2013). It consists of seven subscales, each containing five items. An example item in this questionnaire would be for the participant to imagine the taste of seawater.

The Spontaneous Use of Imagery Scale (SUIS) measures the use of mental visualization in everyday life (Kosslyn, 1998; Reisberg et al., 2003) and consists of 12 items (e.g., *Do you use mental visualization when shopping for groceries at the supermarket?*)

The Shapes Questionnaire (SQ) measures the vividness, ease of generation, and maintenance of mental images (Dean & Morris, 2003). Since participants have to imagine two shapes, this questionnaire consists of two scales, each with 16 items (e.g., *How vivid is the mental image of the shape you generated?*).

The socio-demographic questionnaire included questions about participant age, gender, and hobbies.

Procedure

Participants completed the questionnaires online using the SoSci platform (Leiner, 2021). After approaching the study link, they read Informed Consent, and after they agreed, the testing began. There was no time constraint for completing the questionnaires; the average time required was 50 minutes.

Data Analysis

The PSIQ, SUIS, and SQ questionnaire answers were reversed since the VVIQ and VMIQ had opposite answering scales. Then, the summative scores for each scale and subscales were calculated (a lower score indicated a finer vividness). We applied the Principal Component Analysis in the SPSS statistical program, with the Varimax rotation.

Results

The PCA analysis extracted three components, with the eigenvalues above one, which explained 62.5% of the variance. The structure matrix of the rotated components is presented in Table 1. The first component, multimodal, gathered all Psi-Q scales except the visual subscale, which correlated with the second component. This component explains 24.8% of the variance. The second visual component was saturated with the VVIQ, VMIQ, SUIS, and scores from Psi-Q visual subscale. It explains 22.3% of the variance. The last component is labeled as Scale-specific since it was saturated with the scores from two versions of the SQ scales. This component explains 15.7% of the variance.

Next, we wanted to explore whether participants, considering their hobbies, can be differentiated based on the factor scores on these extracted PCA components. Most of the sample indicated that they engage in sports, arts, social, and cultural activities as hobbies, such as going to the theater, gallery or participating in social volunteering activities. Specifically, 93% of the sample chose at least one of the mentioned activities: sports, arts, social, or cultural. The remaining 7% of the sample expressed interest in other less-represented activities, such as computers and others.

Figure 1 depicts the average scores on the three PCA components for different hobbies. Lower scores denoted higher vividness in each dimension. It can be noticed that based on the PCA component scores, the regularities considering choice of a hobby are not straightforward. However, it can be seen that students who has art hobbies exclusively reported the highest vividness on the visual component as well as students who stated to have several hobbies including sport, social and cultural ones. On the other hand, students who had no hobbies had the lowest vividness scores in the visual and scale-specific dimensions.

Table 1: Structure matrix of the rotated components.

Scales	Components		
	Multimodal (24.8%)	Visual (22.3%)	Scale-specific (15.7%)
Psi-Q (interoception)	.758		
Psi-Q (taste)	.734		
Psi-Q (smell)	.709		
Psi-Q (touch)	.684		.336
Psi-Q (emotions)	.611		
PSIQ (hearing)	.558	.451	
VMIQ (3rd)		.788	.310
VMIQ (1st)		.767	
Psi-Q (vision)	.391	.670	
SUIS		.640	
VVIQ	.397	.583	.388
SQ (2nd shape)			.850
SQ (1st shape)			.808

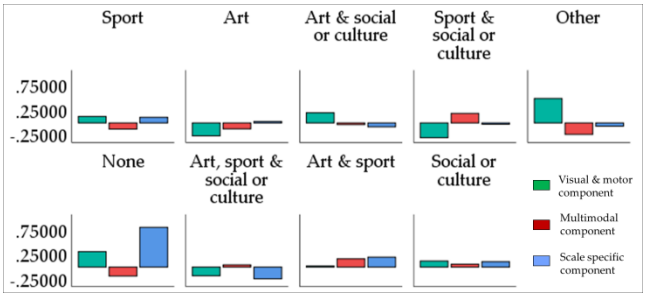

Figure1: Mean factor scores on three PCA components divided by participants' hobbies

Disscusion

In order to explore the latent space of the vividness of the MV scales, we translated the most cited questionnaires and those which capture various sensory-motor aspects of imagery, namely, VVIQ, VMIQ, Psi-Q, SUIS, and SQ.

The PCA analysis extracted three components, two of which gathered scales based on the sensory modalities of MV, namely multimodal and visual, and the third was saturated with the two SQ scales, which capture broader aspects of MV, not just vividness. Our results indicated two critical points. First, it is plausible to measure different sensory aspects of MV, and second, there are differences based on measurement methodology. The SQ scale measures the ability to imagine specific shapes; thus, participants must hold the images in short-term memory. On the contrary, in other scales, the respondent must recall images from episodic memory. Descriptive statistics of factor scores on recorded components, based on students' hobbies, revealed some regularity: students engaged in art hobbies had better vividness in visual imagery, and students with no hobbies had the lowest levels of visual and scale-specific imagery. However, the questionnaires should be administered to respondents from other professions, such as professional artists, engineers, or athletes, to understand better whether the finer vividness of mental images is particularly prevalent among such professionals.

Our results are significant for future research in the field of MV. The potential of these questionnaires should be explored in other domains. The next step should be external validation of these measures, e.g., the correlations with cognitive tasks, such as spatial abilities tests, tasks that require processes in the visual-spatial matrix, etc.

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To Prevent or to Cure: How People Use Traditional, Complementary and Alternative Medicine

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Abstract

To understand the reasons behind the trend of growing use of traditional, complementary and alternative (TCAM) practices this study sought to uncover how people use them - to prevent disease/promote health, to treat medical conditions by complementing official medical treatments, or as an alternative to them. A sample of N = 583 Serbian citizens completed an online questionnaire assessing four TCAM domains: Alternative medical systems (AMS), Natural product-based practices (NP), New Age medicine (NA), and Rituals/Customs (RC). Participants indicated whether they had used a given practice in the past year, and if yes, how they used it. Overall, participants used TCAM preventively in two-thirds of cases, but we also found a significant association between TCAM domain and way of use. AMS was used alternatively more than any other TCAM domain, NP was the most prevalent complementary treatment, while NA and RC were predominantly used preventively. Our results suggest that different domains of TCAM practices may impact people's health differently, depending on how they are used, which should inform interventions.

Keywords: alternative medicine, traditional medicine, preventive TCAM use, alternative TCAM use, health behaviors

Introduction

Traditional, complementary, and alternative medicine (TCAM) denotes a broad set of healthcare practices that are not a part of conventional medical systems (World Health Organization [WHO], 2019). Despite their questionable effectiveness (WHO, 2013), the use of TCAM practices is growing, with half of the general population using it in developed countries (Posadzki et al., 2013). People use these practices for different purposes: 1) to promote health and prevent disease (preventive use), 2) as an addition to conventional medical treatments (complementary use), and 3) as a substitution for conventional treatments (alternative use). While some TCAM modalities do not cause harm (e.g., herbal teas as a complementary treatment for the common cold), others can have detrimental effects on health (e.g., lead pouring as a treatment for anxiety) or interfere with conventional therapies (e.g., using herbal remedies during chemotherapy; Meijerman et al., 2006). However, empirical evidence about how individuals use different TCAM practices is still scarce.

A previous study in Serbia (Purić et al., 2022) suggested that TCAM practices group into four domains: 1) Alternative medical systems (e.g., acupuncture, homeopathy, quantum medicine), 2) Natural product-based medicine (e.g., herbal teas, balms, minerals, antioxidants), 3) New age medicine (e.g., meditation, mindfulness, healing crystals), and 4) Rituals/customs (e.g., prayers for health, water from healing springs, red string around the hand). Unlike previous, conceptual taxonomies (e.g., Kaptchuk & Eisenberg, 2001), these four domains were obtained empirically, based on self-reported use patterns. Furthermore, this novel classification is based on the behavior of Serbian citizens, making it more relevant for the local context, given the cultural specificities of TCAM practices (Kemppainen et al., 2018).

In this study, we aimed to explore how each of the four TCAM domains is typically used - for preventive, complementary, or alternative purposes.

Method

Participants

A total of N = 583 adult Serbian citizens (74% women; M_{age} = 39, SD_{age} = 12.1) voluntarily took part in the study and were not compensated for their participation. An average participant had spent 17.11 years in formal schooling (SD = 2.66), had moderately high self-perceived socioeconomic status (M = 4.06, max = 6, SD = 0.86), and held a somewhat left-leaning political orientation (M = 3.01, from 1 = *left* to 7 = *right*; SD = 1.54). Data were collected online in July 2022 through social networks using the snowball method. The research was approved by the Research Ethics Committee at the Faculty of Philosophy, University of Belgrade, Serbia, reference number 935/1 (https://osf.io/bv7yh).

Instruments and measures

Participants filled in a checklist of 32 TCAM practices (Purić et al., 2022), grouped into four domains: Alternative medical systems (six items, Cronbach's α = .52), Natural product-based practices (nine items, α = .77), New Age medicine (ten items, α = .67), and Rituals/Customs (seven items, α = .71), and asked to indicate whether they used them in the past year. In addition, for each selected practice, participants were asked to consider their most recent experience with a given practice and indicate if they used it for advancing health (preventive use), simultaneously with official medicine therapy (complementary use), or instead of official medicine therapy (alternative use).

Data Transformations

Since only participants who responded that they had used a particular practice in the past year were asked in which way they used it, different participants responded to a different number of items. Subsequently, summary scores for preventive, complementary, and alternative ways of using would not be directly comparable. Therefore, for each participant, we calculated the proportion of TCAM use within a given TCAM domain for each of the three ways of use. We multiplied these proportion scores by the number of participants who used either of the practices from a given domain to obtain observed frequencies.

Results

TCAM practices were most frequently used ($\chi^2(2) = 588.24$, $p < .001$) for preventive purposes (63%), followed by complementary (31%) and alternative purposes (6%). Also, practices from four different domains were not used equally frequently ($\chi^2(3) = 319.05$, $p < .001$), as shown in the last row of Table 1.

The association between TCAM domain and way of use was significant ($\chi^2(6) = 107.23$, $p < .001$; Table 1). To better

understand the nature of this association we created a mosaic plot which visualizes contingency tables (Figure 1) using the mosaic function of the vcd package for R (Meyer at el., 2006; 2023). Tile size indicates the relative frequency of use for both different domains and ways of use. For example, looking at the horizontal axis only we see that Natural-product based practices were the most often used TCAM domain, while Alternative medical systems were used the least.

Table 1. Frequency of use for different TCAM domains and ways of using

Use / Domain	AMS	NP	NA	RC
Preventive	52	308	218	173
Complementary	48	195	47	45
Alternative	27	36	12	6
Total	127	539	277	224

Note. AMS - Alternative medical systems, NP - Natural product-based, NA - New Age medicine, RC - Rituals/Customs

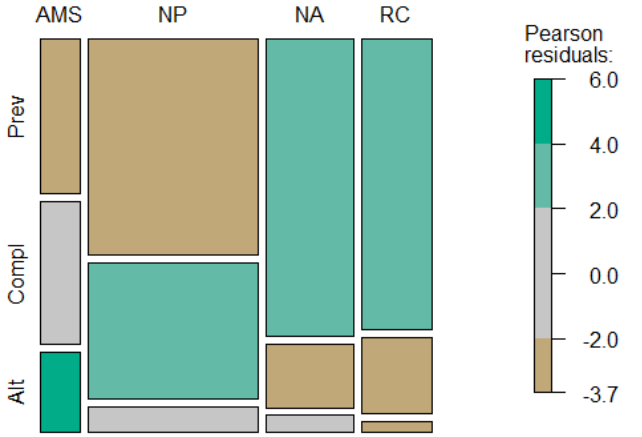

Figure 1. Pearson residuals for the association between TCAM domain (AMS - Alternative medical systems, NP - Natural product-based, NA - New Age medicine, RC - Rituals/Customs) and way of use (Alt - alternative, Compl - Complementary, Prev - Preventive).

On the other hand, tile color indicates the relative size of Pearson residuals i.e. demonstrates which cells contributed to the association. Yellow tiles indicate significantly lower and green tiles significantly higher frequency in a cell than would be expected if there were no association. It is evident that Alternative medical systems were more frequently used in an alternative and less frequently used in a preventive manner, while New Age medicine and Rituals/Customs were predominantly used preventively, and to a much lesser degree in a complementary or alternative way. Natural-product based practices were more frequently used in parallel with official medical treatments and less frequently used preventively compared to other practices.

Discussion

Overall, almost two-thirds of participants used TCAM practices preventively, followed by complementary use, while a minority of participants used these practices instead of official medicine. However, when broken down by type of practice, TCAM domains had different patterns of use. New Age medicine and Rituals/Customs were used preventively more often than other practices, perhaps because many can be incorporated into one's daily or weekly routine (e.g. practicing yoga, meditation, religious practices). Unsurprisingly, complementary use was the most frequent for natural-based products, which are typically presented in media as quick and easy cure-alls (Lazić et al., 2023). Finally, as suggested by their name, alternative use of TCAM was most common in the case of Alternative medical systems, which are based on unconventional ideas about health and disease (WHO, 2019).

To our knowledge, this is the first study not only in Serbia, but worldwide, to offer insights on how various TCAM domains are used. However, our convenience sample was predominantly female and highly educated, so future studies should ascertain these trends on a representative sample. Moreover, it is also important to explore whether some stable characteristics of participants (e.g. socio-demographic, health-related or psychological) are predictive of their preferred manner of TCAM use.

Our findings have important implications, as observed patterns of use may impact people's health differently. While New Age medicine and Rituals/Customs may not be particularly effective in preventing disease, they may not be harmful to health either. However, active ingredients in natural products can interact with drugs or produce side effects, underlying the importance of consulting with healthcare professionals when using these products complementary to treatment. Although the least common, rejecting evidence-based official medicine in favor of alternative practices can cause the greatest harm, since there is no strong evidence in favor of either their safety or efficiency (Ernst, 2019). Knowing the harms of uninformed use of TCAM, providing patients with reliable and responsible sources of information, as well as designing interventions to help patients use evidence for effective decision-making, may prove to be beneficial future avenues for improving population health.

Acknowledgments

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The Role of Parents in Shaping Physical Self-Efficacy Among Adolescent Athletes

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Abstract

During adolescence, the parent-child relationship plays a significant role in forming the attitudes and beliefs of young athletes about the sport itself and themselves. The aims of the research is to examine; 1. the relations between young athletes' physical self-efficacy and the motivational climate created by parents, 2. young athletes' physical self-efficacy and their parents' previous sports involvement, as well as 3. the differences in physical self-efficacy of young athletes in relation to gender. The sample consisted of athletes who actively play organized sports (handball, volleyball, and basketball). Physical Self-Efficacy Scale (PSE) was used, which consists of two dimensions: Physical Ability (PA) and Physical Self-Presentation Confidence (PSPC), and Perceived Motivational Climate in Sport Questionnaire 2 (PIMCQ-2), which consists of three subscales in this sample: Learning, Concern about failure and Achieving effortless success. The results show that the mother's previous sports involvement is not significant for boys' PSE and that the father's previous sports involvement is not significantly related to girls' PSE. However, there is a significant difference in PSPC among girls in relation to their mother's previous involvement in sports. Also, a significant difference was obtained for PA and PSPC and the father's previous involvement in sports, when it comes to boys.

Keywords: young athletes, sport psychology, physical self-efficacy, physical self, adolescence

Introduction

The supportive actions of individuals who hold significance in a person's sporting endeavours establish a social environment where one can enhance their abilities and strive towards personal objectives, thereby meeting their basic psychological needs (Joesaar, 2012; Ryan & Deci, 2000). How these significant individuals' actions and beliefs are interpreted impacts personal expectations and assessments of behaviors that contribute to achieving a goal. If such actions and beliefs are perceived positively, they will foster feelings of competence, control, positive emotions, and internal motivation. Among the social agents involved in a child's psychosocial development through engagement in physical activities, parents hold an important role (Vallerand, 1997). The involvement of parents in sports can be viewed through three fundamental roles: initiator, interpreter, and role model (Lauer et al., 2010). Research indicates that fathers often take the lead as initiators for boys, while mothers tend to be the primary initiators for girls when it comes to sports activities (Kremer, Trew, & Ogle, 1997). As role models, parents influence their child's behavior by exemplifying their actions and reactions within sporting contexts. Studies have revealed that parental feedback and expectations significantly impact an athlete's commitment to a sport and their motivational growth (Brustad, Babkes, & Smith, 2001; Vesković, Valdevit, & Đorđević-Nikić, 2013). The parents' behaviors and attitudes have a significant influence on the athletes' motivational outcomes. Athletes who perceive their parents as positive role models and receive consistent and encouraging feedback regarding their sporting progress tend to develop a heightened sense of competence in their athletic pursuits (Trbojević, 2018). Among the prevalent interpersonal factors that contribute to athletes discontinuing sports, young athletes frequently mention parental pressure and an achievement-oriented motivational climate established by their parents (Trbojević, 2018).

Method

Sample

The sample consisted of 258 participants (50.8% boys), aged 11 to 17, from the territory of Vojvodina, who actively play organized sports in different sport clubs. The sports in question were handball, volleyball, and basketball.

Materials

In this study, Physical Self-Efficacy Scale (PSE) was used to assess young athletes' beliefs in their physical

capabilities. The Physical Self-Efficacy Scale consists of two distinct dimensions, Physical Ability (PA) and Physical Self-Presentation Confidence (PSPC). Perceived physical ability represents the athlete's belief about physical characteristics, such as strength, agility, and speed, while physical self-efficacy represents the athlete's body confidence in moments when they need to show their skills in front of others and be visible (Ryckman, Robbins, Thornton & Cantrell, 1982)

Parents' previous involvement in sport was examined using a dichotomous question about their previous sports engagements (Example question: "Has your mother ever been involved in sports before?").

The questionnaire of perceived motivational climate in sport created by parents (Perceived Motivational Climate in Sport Questionnaire 2 - PIMCQ-2, White, Duda, & Hart, 1992) contains 36 items, 18 each for mother and father. The questionnaire assesses athletes' perceptions of the motivational climate initiated by their fathers and mothers. It consists of three subscales: the Learning subscale refers to the task-oriented motivational climate (Example sentence: Mother/Father… "…encourages me to enjoy learning new skills."), the Achieving Effortless Success subscale (Example sentence: Mother/Father… "…says that it's important for me to win without putting in any effort.") and the Concern about failure (Example sentence: Mother/Father… "…makes me worry about failure.").

Procedures

After obtaining consent from football clubs and parents of the children, the process of data collection was initiated across various locations within the territory of Vojvodina, including Novi Sad, Kikinda, Temerin, Zrenjanin, Apatin, Sombor, Crvenka, Ruma, and Sremski Karlovci.

Results

The findings derived from the T-test for independent samples indicate that the mother's previous sports involvement is not statistically significant for boys' PA (*t1 (119) = 0.99, p = 0.32, d = 0.004*) and PSPC (*t2 (120) = 1.34, p = 0.18, d = 0.007*). Similarly, no significant difference was observed when examining father's previous sports involvement related to girls' Physical Ability (PA) (*t1 (116) = -0.38, p = 0.7, d = 0.0006*) and Physical Self-Presentation Confidence (PSPC) (*t2 (116) = 0.08, p = 0.94, d = 0.00003*).

However, girls, whose mothers didn't play sports, scored higher at PSPC (*t (116) = -2.27, p = 0.002, d = 0.02*) compared to girls whose mothers played sports.

When it comes to boys, those whose fathers played sports score higher on both dimensions: PA (*t1 (122) = 3.17, p = 0.03, d = 0.04*) and PSPC (t*2 (121) = 2.24, p = 0.03, d = 0.02*).

The results of the regression analysis, where subscales of motivational climate represented predictors, show that this model is statistically significant and explains 14.2% of PA (F (6,217) = 5.84, p = .001), and 10.7% of PSPC (F (6,212) = 4.12, p = .001). Task-oriented motivational climate created by mother stands out as the most significant individual predictor of PA (β=.332, p=.001).

The findings derived from the T-test for independent samples indicate that there is no statistically significant difference based on gender regarding the dimensions of PA (t1 (244) = 0.29, p = 0.33, d = 0.04) and PSPC (t2 (242) = 0.48, p = 0.92, d = 0.06).

Discussion and Conclusion

Results show that parents have a formative role in adolescents' physical self-efficacy.

The results indicate that the role of mother and father is not the same for boys and girls. The mother's previous involvement in sports compromises the girl's self-efficacy. When it comes to boys, it seems that identification with a father who was involved in sports additionally increases the degree of physical self-efficacy.

The findings obtained from this study serve as a valuable foundation for further research aimed at comprehending the parental influence on children's sports careers. Results highlight the significance of exploring the relationship between mothers and daughters and how the differences in those relationships can have an impact on girls' physical self-efficacy.

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Trust Issues and Suspicious Minds? Political Distrust as a Determinant of Endorsement of Conspiracy Theories: Evidence from Multiple International Datasets

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Abstract

Trust in the political system has been recognised as an important building block of well-functioning social systems. Conversely, distrust in the political system can motivate individuals to seek leadership and relevant information elsewhere. The aim of this study was to examine the role of political distrust as a determinant of the endorsement of conspiracy theories. Three large-scale international datasets were used for this purpose: European Social Survey round 9 (N = 49,519 from 29 European countries) and round 10 (N = 26,094 from 17 European countries available at the time the manuscript was prepared), and the ICSMP COVID-19 data (N = 51,404 participants from 69 countries worldwide). Results showed that at the individual level, within each country, participants who expressed lower trust in politicians and the national parliament were more likely to endorse all conspiracy theories (correlations ranged from -.09 in Portugal and Slovenia to -.38 in Latvia, all $p < .01$). Moreover, endorsement of conspiracy theories at the national level was higher in countries with lower overall trust in politicians and national parliaments. This was evidenced by correlations ranging from -.86 to -.92 in the dataset comprising ESS round 9 and ESS round 10 data, and from -.63 to -.77 in the dataset comprising ESS9 and ICSMP COVID-19 data (all $p < .01$). These findings confirm the relevance of political (dis)trust in the proliferation of conspiratorial narratives and emphasize the need to understand its individual and contextual determinants better.

Keywords: trust, parliament, politicians, conspiracy theories, conspiracy beliefs

Introduction

Political trust, i.e., "citizens' assessments of the core institutions of the polity" (Zmerli et al., 2007, p. 41), primarily refers to their judgment of whether the system and its representatives are responsive (Miller & Listhaug, 1990) and reliable (Blind, 2007). It is deemed a fundamental resource for democratic governance and social cooperation. Citizens are more likely to adhere to government decisions if they perceive the system to be legitimate (Tyler & Huo, 2002), trustworthy (Rudolph & Evans, 2005), or acting for the common good (Dalton, 2004). Indeed, research shows political trust is relevant for outcomes such as compliance with tax law, policy preferences, voter turnout, and populist voting, amongst others (Franc et al., 2020; Geurkink et al., 2020; Hetherington, 2005; Hooghe & Marien, 2013; Scholz & Lubell, 1998). Furthermore, a lack of political trust can become a severe problem, especially during crises, as citizens may be unwilling to follow the recommendations of political leaders and institutions, turning instead to other sources of information. One of the sources of information people can and do turn to is conspiracy theories (CTs).

Conspiracy beliefs can be defined as beliefs attributing various social and political events, phenomena, and circumstances to covert schemes orchestrated by multiple influential entities, working secretly for their own advantage at the expense of the greater good, when other explanations are more probable (Douglas et al., 2019; Uscinski et al., 2016; van Prooijen & van Vugt, 2018). Research has shown that various conspiracy beliefs, including those that are inconsistent and even contradictory, tend to be related in that the same individuals who believe in one conspiracy theory are more likely to believe in others (van Prooijen & Acker, 2015; Wood et al., 2012). This finding has led some authors to argue that there is a general conspiracy disposition, and some researchers do indeed find evidence in support of a unidimensional conspiracy mentality (Bruder et al., 2013; Lantian et al., 2018; Swami et al., 2011).

Conspiracy narratives have always been around and are a universal feature of our species, present in every society (van Prooijen & Douglas, 2018; Uscinski & Parent, 2014). While the general perception might be that conspiracy beliefs are currently "on the rise", evidence on the matter is not so clear (Douglas et al., 2019; van Prooijen & Douglas, 2018). Whether or not the Internet actually facilitates the development and strengthening of CTs overall (see Douglas et al., 2019; Uscinski et al., 2018), research suggests that the Internet, particularly social networks, may play an important role in the rapid spread of CTs and foster the emergence of distinct and polarised online communities characterised by so-called echo chambers with their own cascade dynamics (Bessi et al., 2015; Del Vicario et al., 2016).

Research has shown CTs are associated with various negative psychological phenomena, such as feelings of anxiety, powerlessness, lack of control, being disadvantaged as well as reduced interpersonal trust (e.g., Abalakina-Paap et al., 1999; Bruder et al., 2013; Goertzel, 1994; Grzesiak-Feldman, 2013; Jolley & Douglas, 2014). Thus, it is reasonable to assume that distrust in political institutions may also be linked to CTs. In fact, many CTs themselves clearly implicate the role of government and its institutions in secret plots and malevolent scenarios. Although there is evidence supporting this notion (e.g., Devine et al., 2023; Einstein & Glick, 2013; Goldberg & Richey, 2020; Schlipphak et al., 2022; see also Moore, 2018), the relationship between political trust and CT beliefs has not been as extensively investigated as one might expect. In addition, context also plays a role since CTs seem to flourish in challenging circumstances and times of crisis

(Marchlewska et al., 2022; van Prooijen & Douglas, 2017). Given this, the recent COVID-19 pandemic provides a pertinent context for further investigation.

While there is a growing interest in the study of conspiracy beliefs and significant progress has been made, much of the existing research predominantly derives from an Anglo-Saxon context. Hence, the goal of this study was to provide a snapshot within a broader European context, serving as a springboard for further, more nuanced research. Specifically, the aim was to investigate the role of political trust, at the country and individual level, as a determinant of endorsement of CTs. The hypothesis was that distrust in politicians and the national parliament would be positively associated with the endorsement of various CTs (both general and COVID-19-related).

Method

Sample and Procedure

Data were drawn from three large-scale international datasets: the European Social Survey (ESS) round 9 (ESS, 2018; N = 49,519 from 29 European countries) and round 10 (ESS, 2020; N = 26,094 from 17 European countries available at the time the manuscript was prepared), and the ICSMP[1] COVID-19 dataset (Azevedo et al., 2023; N = 51,404 participants from 69 countries worldwide). For country-level analyses, datasets were combined. The first set comprised aggregated political trust data from ESS9 and aggregated support for CTs from ESS10 across 15 countries available both in ESS9 and ESS10. The second set comprised aggregated political trust data from ESS9 and aggregated support for CTs from ICSMP across 20 countries available both in ESS9 and ICSMP datasets. Individual-level analyses were conducted across the 17 countries available in the ESS10.

Materials

Political trust, specifically trust in politicians and trust in the national parliament, was measured with two identical items across both rounds of ESS. Participants indicated their trust level on a scale from 0 (do not trust at all) to 10 (have complete trust), reflecting their personal trust in their country's parliament (trust_parliament) and politicians (trust_politicians).

Endorsement of different CTs was measured by asking participants to mark their level of agreement (1 – *disagree strongly* to 5 – *agree strongly*) with three statements[2] from the ESS10 - the first two pertaining to general conspiracy beliefs regarding politics and scientists and the last one concerning COVID-19. Additionally, four items[3] were used to measure endorsement (0 – *completely disagree* to 10 – *completely agree*) of different COVID-related conspiracy beliefs within the ICSMP survey.

Results

To avoid the issue of reverse causality in the country-level analyses, aggregated data on political trust from the ESS9 was used to predict aggregated support for general and COVID-related CTs from the ESS10 dataset and four different COVID-related CTs from the ICSMP dataset. For individual-level analyses, both political trust and CT endorsement data were derived from the ESS10.

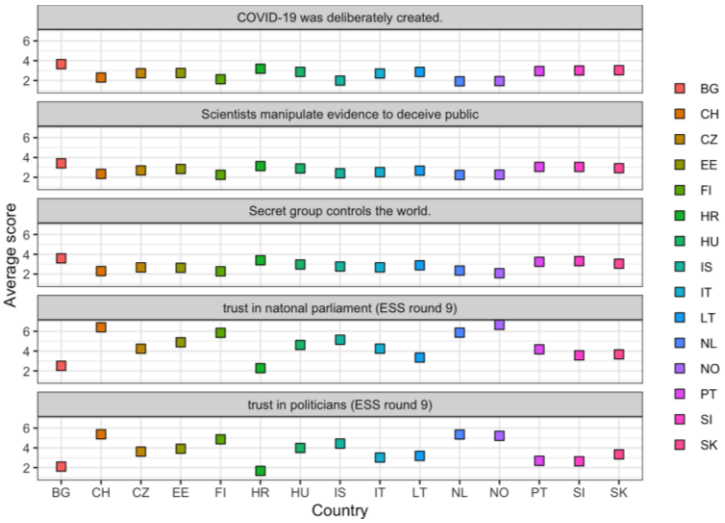

Figure 1: Country levels of political trust (ESS9) and endorsement of CTs (ESS10).

Descriptive results from the first country-level dataset, comprising 15 countries (Figure 1), indicate that trust levels are generally higher in Germanic countries[4], such as Switzerland, the Netherlands, and Scandinavian countries, as well as Finland[5]. On the other hand, the lowest levels can be observed in Croatia, Bulgaria, other Slavic countries, and Latvia and Italy. Regarding conspiracy endorsement, a clear distinction is again observed between Germanic countries (Norway, the Netherlands, Iceland, Switzerland) and

[1] International Collaboration on the Social & Moral Psychology of COVID-19, for more information visit: https://icsmp-covid19.netlify.app/

[2] (politics) A small secret group of people is responsible for making all major decisions in world politics.
(scientists) Groups of scientists manipulate, fabricate, or suppress evidence in order to deceive the public.
(covid) COVID-19 is a result of deliberate and concealed efforts of some government or organisation.

[3] (bioweapon) The coronavirus (COVID-19) is a bioweapon engineered by scientists.
(authoritarian) The coronavirus (COVID-19) is a conspiracy to take away citizens' rights for good and establish an authoritarian government.
(hoax) The coronavirus (COVID-19) is a hoax invented by interest groups for financial gains.
(crash) The coronavirus (COVID-19) was created as a cover-up for the impending global economic crash.

[4] Countries are labelled according to ISO 3166-1 alpha-2 codes.

[5] Finland is often associated with Scandinavia due to historical, linguistic, and cultural ties, but strictly speaking it is not a Scandinavian, i.e., Germanic country.

Finland, which show lower levels of conspiracy beliefs, versus Slavic countries that exhibit higher levels (Bulgaria, Croatia, Poland, Slovenia, Slovakia, the Czech Republic).

Table 1: Correlations of political trust from the ESS9 and endorsement of CTs from the ESS10.

		(1)	(2)	(3)	(4)	(5)
(1)	trust_politicians	1	.96	-.89	-.91	-.88
(2)	trust_parliament		1	-.90	-.92	-.86
(3)	covid			1	.89	.95
(4)	politics				1	.94
(5)	scientists					1

Note. All $p < .001$.

Moreover, correlational analyses confirm the hypothesis - endorsement of different conspiracy beliefs was *higher* in countries with *lower* overall trust in politicians and national parliament, with correlations ranging from -.86 to -.92 (Table 1).

At the individual level, within each of the 17 countries featured in the ESS10, correlations provide additional support for the hypothesis. Specifically, participants reporting lower trust in politicians and their national parliament also expressed higher endorsement of all conspiracy theories - the two general CTs and the COVID-related one (Table 2). The correlations were generally in the mid to strong range (Funder & Ozer, 2019), with the highest observed in Latvia (-.38).

Table 2: Correlations of political trust and endorsement of CTs based on the ESS10 comprising 17 countries.

BG (n = 2,350)

		(1)	(2)	(3)	(4)	(5)
(1)	trust_politicians	1	.71	-.20	-.20	-.18
(2)	trust_parliament		1	-.16	-.18	-.17
(3)	covid			1	.57	.57
(4)	politics				1	.69
(5)	scientists					1

CH (n = 1,299)

		(1)	(2)	(3)	(4)	(5)
(1)	trust_politicians	1	.68	-.19	-.22	-.20
(2)	trust_parliament		1	-.23	-.24	-.25
(3)	covid			1	.34	.45
(4)	politics				1	.50
(5)	scientists					1

CZ (n = 2,125)

		(1)	(2)	(3)	(4)	(5)
(1)	trust_politicians	1	.76	-.20	-.17	-.20
(2)	trust_parliament		1	-.17	-.14	-.16
(3)	covid			1	.58	.62
(4)	politics				1	.82
(5)	scientists					1

EE (n = 1,484)

		(1)	(2)	(3)	(4)	(5)
(1)	trust_politicians	1	.68	-.24	-.23	-.29
(2)	trust_parliament		1	-.30	-.25	-.36
(3)	covid			1	.46	.55
(4)	politics				1	.60
(5)	scientists					1

FI (n = 1,538)

		(1)	(2)	(3)	(4)	(5)
(1)	trust_politicians	1	.76	-.19	-.21	-.27
(2)	trust_parliament		1	-.25	-.28	-.32
(3)	covid			1	.40	.42
(4)	politics				1	.56
(5)	scientists					1

HR (n = 1,395)

		(1)	(2)	(3)	(4)	(5)
(1)		1	.70	-.16	-.15	-.12
(2)			1	-.20	-.18	-.16
(3)				1	.30	.45
(4)					1	.38
(5)						1

HU (n = 1,343)

		(1)	(2)	(3)	(4)	(5)
(1)		1	.74	-.24	-.16	-.20
(2)			1	-.25	-.17	-.18
(3)				1	.63	.59
(4)					1	.67
(5)						1

IS (n = 837)

		(1)	(2)	(3)	(4)	(5)
(1)		1	.74	-.15	-.25	-.21
(2)			1	-.16	-.28	-.23
(3)				1	.32	.35
(4)					1	.34
(5)						1

IT (n = 2,292)

		(1)	(2)	(3)	(4)	(5)
(1)		1	.73	-.25	-.12	-.20
(2)			1	-.27	-.13	-.23
(3)				1	.42	.51
(4)					1	.66
(5)						1

LT (n = 1,413)

		(1)	(2)	(3)	(4)	(5)
(1)		1	.73	-.32	-.19	-.27
(2)			1	-.38	-.25	-.36
(3)				1	.45	.59
(4)					1	.58
(5)						1

GR (n = 2417)

		(1)	(2)	(3)	(4)	(5)
(1)		1	.69	-.20	-.16	-.17
(2)			1	-.23	-.17	-.22
(3)				1	.61	.69
(4)					1	.66
(5)						1

NL (n = 1,381)

		(1)	(2)	(3)	(4)	(5)
(1)		1	.64	-.21	-.23	-.28
(2)			1	-.30	-.27	-.34
(3)				1	.42	.53
(4)					1	.54
(5)						1

NO (n = 1,379)

		(1)	(2)	(3)	(4)	(5)
(1)		1	.71	-.26	-.26	-.29
(2)			1	-.31	-.29	-.32
(3)				1	.34	.42
(4)					1	.47
(5)						1

PT (n = 1,264)

		(1)	(2)	(3)	(4)	(5)
(1)		1	.63	-.23	-.11	-.19
(2)			1	-.24	-.09**	-.18
(3)				1	.26	.37
(4)					1	.45
(5)						1

SI (n = 1,097)

		(1)	(2)	(3)	(4)	(5)
(1)		1	.70	-.22	-.09**	-.18
(2)			1	-.25	-.11	-.24
(3)				1	.20	.40
(4)					1	.38
(5)						1

SK (n = 1,135)

		(1)	(2)	(3)	(4)	(5)
(1)		1	.79	-.27	-.30	-.27
(2)			1	-.29	-.29	-.27
(3)				1	.68	.64
(4)					1	.72
(5)						1

MK (n = 1,156)

		(1)	(2)	(3)	(4)	(5)
(1)		1	.68	-.15	-.13	-.12
(2)			1	-.21	-.13	-.16
(3)				1	.37	.43
(4)					1	.55
(5)						1

Note. All $p < .001$ except for two correlation coefficients marked with ** which denotes $p < .01$. ISO 3166-1 alpha-2 codes used as country labels.

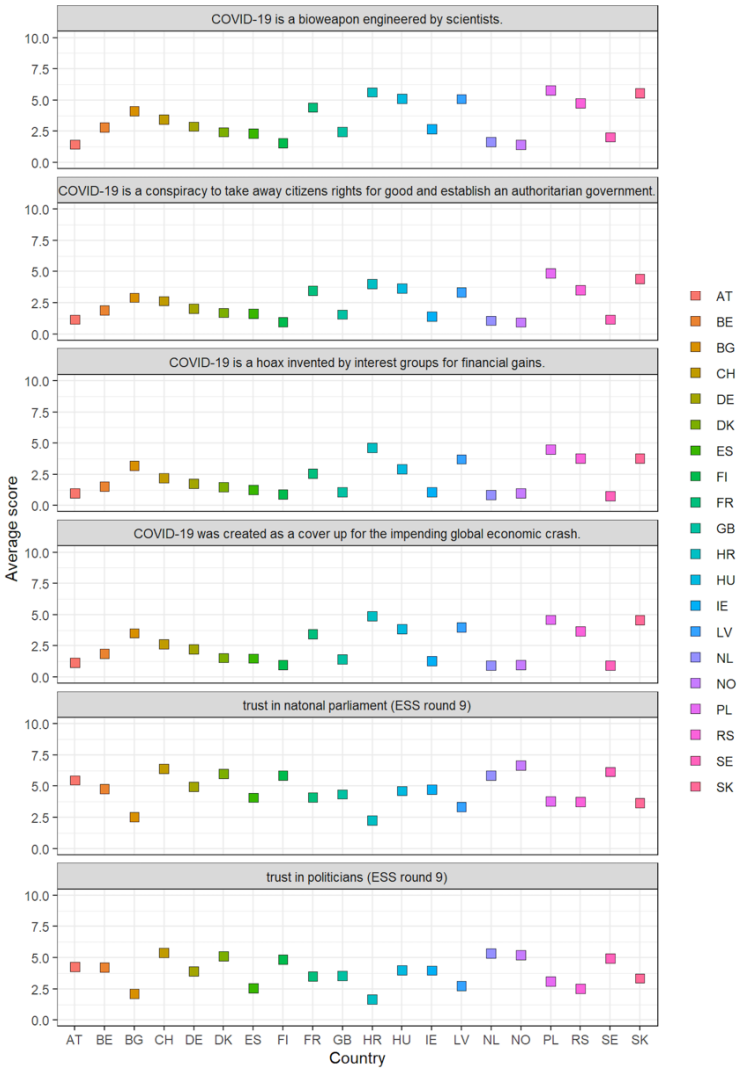

Figure 2: Country levels of political trust (ESS9) and endorsement of COVID-related CTs (ICSMP).

Descriptive results from the second country-level dataset comprising 20 countries are comparable to the first one (Figure 2). Considering an additional five countries, trust levels are, once again, generally higher in Western European countries, primarily Nordic ones, while the lowest levels are observed in Slavic countries, Spain, and Lithuania. Conspiracy endorsement is generally lower in Nordic and other Germanic countries and Spain, and highest in Eastern European countries and, interestingly, France.

Table 3: Correlations of political trust from the ESS9 and endorsement of COVID-related CTs from the ICSMP.

		(1)	(2)	(3)	(4)	(5)	(6)
(1)	trust_politicians	1	.97	-.68**	-.63**	-.72	-.69
(2)	trust_parliament		1	-.76	-.70	-.77	-.77
(3)	bioweapon			1	.98	.96	.98
(4)	authoritarian				1	.96	.98
(5)	hoax					1	.98
(6)	crash						1

Note. All $p < .001$ except for two correlation coefficients marked with ** which denotes $p < .01$.

Correlational analyses affirm the previous results in that *lower* overall trust in politicians and national parliament was associated with *higher* endorsement of different CTs, with correlations ranging from -.63 to -.77 (Table 3).

Discussion

This paper provides an overview of the relationship between political (dis)trust and endorsement of CTs using multiple international datasets. Consistent with some previous research, the main finding is that greater distrust in politicians and national parliaments is predictive of higher endorsement of both generic (Schlipphak et al., 2022) and various COVID-related CTs (Devine et al., 2023; Tonković et al., 2021). This pattern holds overall and in each of the European countries considered. Moreover, these associations are relatively consistent and similar regardless of the specific indicator of political trust or the particular conspiracy belief in question, which speaks to the underlying general conspiracy disposition (Bruder et al., 2013; Lantian et al., 2018; Swami et al., 2011; Wood et al., 2012). Overall, these findings tentatively suggest that political (dis)trust can play a relevant role in the development and spread of various conspiracy narratives. However, to conclusively verify this relationship and investigate it in a more nuanced way, a more systematic approach and a robust research design are warranted. Country-level descriptive results provide some additional contextual insights. First, relatively low levels of political trust are evident across the board (rarely reaching the midpoint of the scale) and are especially notable in some countries (e.g., Croatia, Slovenia, Bulgaria). This observation pertaining to the period during 2018, i.e., prior to the pandemic, is arguably more concerning than the CT endorsement rates, which generally do not seem so extreme, seldom reaching the top ends of response scales (e.g., Bulgaria, Poland). Furthermore, there was a relatively clear pattern of difference between Eastern European, primarily Slavic countries, and Western European, mainly Nordic ones. The former group typically exhibited lower political trust levels and higher conspiracy endorsement, while the opposite was true for the latter. This observation aligns with the findings indicating that political trust in all political institutions is consistently higher in Western European countries than in countries with a history of socialist or communist regimes (e.g., Linde & Ekman, 2005; Mishler & Rose, 2001). To comprehend these patterns holistically, one must also factor in contemporary societal dynamics. For example, challenges to democratic development, corruption, media restrictions, and economic instability, as well as the (post-)conflict nature of Eastern European societies with ethnic tensions, religious disputes, and territorial ambitions (especially in the Balkans), add layers of complexity. Additionally, existing literature is crucially lacking when it comes to cross-cultural comparisons regarding CTs.

As mentioned, the results generally indicate similar predictive patterns of both political trust indicators. Given that some research points to the importance of differentiating the dimensions of institutional trust – trust in experts and science versus political institutions in the context of the COVID pandemic (Blanuša & Brakus, 2023; van Mulukom et al., 2022; see also Kaliterna Lipovčan et al., 2022; Maglić et al., 2022), further investigation of the nature and contextual determinants of the relationship between institutional trust and conspiracy beliefs may prove theoretically and practically valuable.

The present study bears all the limitations of a correlational cross-sectional design, which precludes any causal conclusions. The general approach was parsimonious since the main goal was to provide an initial snapshot of the relationship. Yet, both political trust and conspiracy beliefs are complex phenomena with many relevant factors at play, from individual characteristics, like personality, cognition, risk factors, to broader contextual elements at both macro and micro levels. Despite examining the relationship between political trust and CTs across multiple countries, all the nations in this study are WEIRD (Henrich et al., 2010). Thus, for instance, it would be pertinent to delve into the role of media exposure and media literacy, analytic thinking, and the social and political climate in shaping trust and conspiracy beliefs. Namely, comparing and contrasting how different cultural values, norms, and histories influence these dynamics would be valuable. In the context of the recent crisis, how governments and media in different countries have communicated about the pandemic is another factor that needs further investigation in shaping political trust and the endorsement of CTs.

Given the potential implications of these findings, more nuanced, ideally longitudinal, research taking into account the aforementioned complexities is needed to inform researchers and decision-makers. In conclusion, the findings underline the relevance of political (dis)trust when examining CTs and emphasise the need to better understand individual and contextual determinants of this relationship.

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Impact of Fictitious Artistic Authority on Recognition of the Order of Colors

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Abstract

This research examined the informational social influence on recognition of the order of colors. More precisely, we looked into the differences in accurate recognition of the standard stimulus between the first measurement, in which there was no answer from an artistic authority, and the second measurement, in which there was. A total of 50 participants (equal number of males and females) were first shown a standard stimulus lasting 1 second, and their task was to remember it and then recognize it among the four offered examples that were exposed for 3 seconds. The second phase was identical to the first, and the only difference was the presence of a response from an artist. In sum, 23% of the cases were changed as a result of conformity. The analysis of the subject's responses to the variable "accuracy of recognition" showed that there was a statistically significant difference in terms of the average accuracy of recognition of the order of colors in the situation with and without the artist's response. The advantage of this research was the introduction of recognition accuracy into the field of conformity studies, while some of the potential limitations were related to the use of the responses of artistic authority as majority that exerted influence as well as the external validity of the results.

Keywords: informational social influence; artistic authority; recognition the order of colors; accurate recognition

Introduction

This study examines informational social influence, which was determined as the need to conform with others because we believed that their interpretation of situations was more accurated than our's, so someone else's information serves as a guide to our own behavior (Deutsch & Gerard, 1955). The results of the previous research (Moor, 1921; Sherif, 1937; Crutchfield, 1955; Rot, 1972 according to Rot, 2015; Baron, Vandello, & Brunsman, 1996; Levine, Higgins, & Choi, 2000; Đorđević, 2022) showed that informational social influence was a powerful phenomenon, regardless of the group's physical presence by which subjects were conformed or it's a fictional group, only said to exist. Guided by this finding and seeing that there was no research in which the level of conformity with artistic authority, as the person who represented a group of people skilled in a certain area, was examined. The informational social influence was operationalized as a judgment of artistic authority, and we assessed its impact on recognizing the order of colors. We explored differences in accurate recognition of standard stimuli between the first measurement, in which there was no answer from artistic authority, and the second measurement, in which there was.

Method

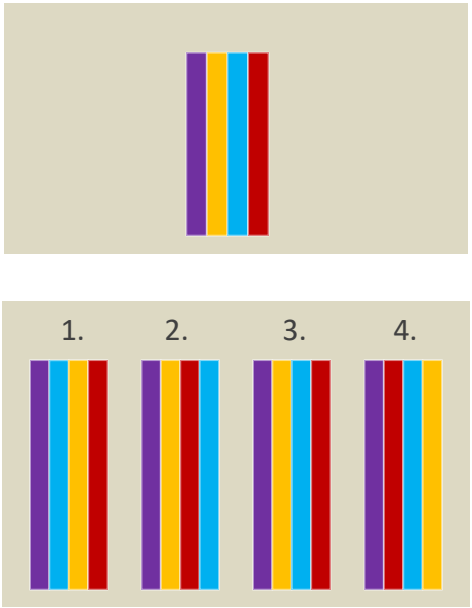
Sample

The sample of this research was convenient and consisted of 50 participants from the general population. Participants were distributed equally by gender (25 females and 25 males). The age range of participants was from 18 to 65 years, with the average age being 41.5 years (SD = 15.8).

Stimuli

The stimuli material was made up of 24 pictures on which a specific order of colors was displayed and the material was constructed for this study. Six pictures represented standard stimuli, that is, the order of colors participants had to memorize and then recognize. The rest of the 18 pictures represented the order of colors with whom standard stimuli are exposed and whose choice was considered to be wrong by participants. In other words, the six standard pictures were the targets and the remaining 18 were baits/buffers.

Figure 1: Example of stimuli used in the study



Design and Procedure

At the beginning of the experiment, participants were told that research examined how good people were in recognizing colors and if their memory of colors were identical to the artistic authority. They also received information that artists were extremely good at recognizing even the finest shades of colors and that it's important that they themselves be successful because their scores and scores from artists would be compared (to each other). Participants were first shown a picture in which four colors were lined up in a specific sequence, and this picture represented standard stimuli and its time of exposition lasted for one second. Their task was to memorize a specific sequence of colors representing standard stimuli and to try to recognize it between four stimuli, one of which was real. The exposition lasted three seconds. The experiment was conducted in two phases, and in both phases, participants were exposed to the same stimuli. The one thing that was different in these two phases was the presence or absence of a response from artistic authority, which was wrong. The respondents received this information at the end of the study, after which consent for the use of their data for research purposes was sought. If the participant conformed, they got one point and if there was no conformity, they didn't receive any points. A higher score would indicate a bigger proclivity to conformity, while a lower score would indicate a smaller proclivity to conform. The goal of time limitation in stimuli exposure was to make the situation unclear, unspecified, and unstable so the conditions that were characteristic for informational social influence to be manifested, were created.

Results

Table 1: Descriptive measures for variables used in the study

Measures	*M*	*SD*	*Skewnss*	*Kurtosis*
Age	41.50	15.777	-0.143	-1.405
Conformity	1.38	1.419	0.652	0.476
Accurate recognition 1	4.06	0.646	-0.585	-0.243
Accurate recognition 2	2.98	1.744	-0.016	-0.966

Note. Accurate recognition 1 - measured in situations without an answer from artistic authority; Accurate recognition 2 - measured in situations with an answer from artistic authority.

Table 1 showed that variables conformity, accurate recognition 1 and accurate recognition 2 had the distribution of measures that didn't deviate from normal, was obtained (the range of values for skewness and kurtosis is +/-1). The distribution of measures on the age variable gave platykurtic distribution because the value of kurtosis is lower than -1. This indicates increased dispersion or dispersion for results distribution. Obtained results showed that participants manifested a tendency to conform in 23% of cases. On the variable accurate recognition, the situation without an answer from an artistic authority, 66,8% of participants were successful in recognizing the order of colors. In the situation with an answer, 49,6% successfully recognized the order of colors. This study didn't examine whether the participants' wrong answers were identical to the answers of supposed artistic authority. There was a statistically significant difference in average expression for accurate recognition of the order of colors in situations with and without an answer from an artistic authority, $t(49) = 4.59$, $p = 0.001$, d = 0.649. A positive value of the t-test meant that participants were more accurate in recognizing the order of colors in the first situation, the situation without an artist's answer. The effect size (Cohen's d) was in the medium range.

Discussion and Conclusion

The aim of this research was to investigate the degree of conformity to supposed artistic authority on recognition of the order of colors. The given rate of 23% of participants who conformed was lesser than previous findings in research in which perceptive stimuli was used. Obtained conformity rate didn't pass 30% in those previous studies (Sherif, 1937; Asch, 1955, 1956; Crutchfield, 1955; Rot, 1960, according to Rot 2015; Baron, Vandello, & Brunsman, 1996; Đorđević, 2022). Similar percentage of conforming was observed in Moore (1921) in which participants conformed less to the ostensible scientific authority than to the ostensible majority. The goal of introducing the variable accurate recognition in the field of conformity was to determine whether participants gave accurate answers when they received answers from artistic authority or when they didn't have that information. Results showed that participants gave accurate answers more often when there was no answer from an artistic authority. Future research could be directed towards including associates that would present a united answer, prior to a naive participant, about the stimuli that they recognize as a standard. In this way, besides introducing a time limitation in stimuli exposure so the situation is made convenient to manifest informative social influence, we would create a normative social influence. The proposed combination of two types of social influence could lead to greater conformity than in the study we report on. Another possibility that could lead to a higher percentage of conformity is to insist on the personal importance of the involvement of research participants, so that they could become more motivated to give more accurate answers on a given task. This paradigm was successfully employed in the study of Baron and associates, where the researchers accentuated participants' answers and gave monetary compensation to the most successful in recognizing the suspect (Baron, Vandello, & Brunsman, 1996). Future studies should address these problems.

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Work-Family Conflict and Turnover Intentions: The Mediating Role of Burnout

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Abstract

The Turnover intention (TI) refers to an employee's voluntary intention to leave an organization. According to the JD-R model, high job demands lead to adverse health-related outcomes, such as burnout and negative organizational outcomes, such as turnover intentions. In addition to that, the JD-R model proposes that burnout also mediates high job demands and adverse organizational outcomes. Even though the JD-R model has received much empirical support, it has one limitation – focusing on job demands as the primary source of work-related outcomes while ignoring non-work-related factors. On the other hand, prior studies highlight that work-related and home-related factors, such as work-family conflict (WFC) and family-work conflict (FWC), also influence health-related and organizational outcomes. Therefore, this study aimed to examine the mediating role of burnout in the relationships between WFC and FWC and employee turnover intention. The sample consisted of 182 employees. We used the Scale of Work-Family Conflict, Oldenburg Burnout Inventory and Turnover Intention Scale. Mediation analysis results showed that the relationship between WFC and FWC, and TI is fully mediated by burnout, indicating that higher WFC and FWC contribute to higher employee burnout, leading to higher TI. The obtained findings have been considered in light of theoretical and practical importance.

Keywords: work-family conflict; family-work; conflict; turnover intention; burnout; mediator

Introduction

Turnover intention (TI) refers to an employee's voluntary intention to leave an organization (Saks, 2006). Employee turnover harms an organization's efficiency, effectiveness, and overall performance (Seligman, 2011; Shaw, 2011). Therefore, understanding the factors that influence TI is critical for developing intervention strategies to reduce TI.

The job demands-resources (JD-R) model is a widely accepted theoretical model for explaining the dynamic of work-related outcomes, including employees' TI (Schaufeli & Bakker, 2004). Per the JD-R model, high job demands result in adverse health-related outcomes like burnout and negative organizational outcomes like TI (Schaufeli & Bakker, 2004). Schaufeli and Taris (2014) suggest that in addition to this main effect, burnout also serves as a mediator between high job demands and adverse organizational outcomes. Schaufeli and Taris (2014) also point out that non-work-related factors can influence work-related outcomes. However, current studies on the JD-R model mostly ignore non-work-related factors and prioritize job demands as the primary source of work-related outcomes. The JD-R model studies should include both home and work demands because prior studies (e.g., Netemeyer, Boles, & McMurrian, 1996) show that factors related to work and home, such as work-family conflicts, also affect health-related and other outcomes.

Therefore, this study aimed to examine the mediating role of burnout in the relationships between work-family conflict (WFC) and family-work conflict (FWC) and employee TI. These relationships can be explained using the Conservation of resources (COR) theory (Hobfoll, 2002). According to the COR theory, individuals strive to acquire, accumulate, and maintain the resources they value. When resources are lost or exhausted, a loss spiral begins, stress occurs, and people become defensive to protect themselves, recover from resource losses, and restore well-being (Hobfoll, 2002). Work-family conflicts result from losing resources while an individual tries to fulfil all their responsibilities in work and family contexts, and the desire to quit a job appears could be a tactic to regain lost resources and personal equilibrium (Feldman & Ng, 2007; Singh, Zhang, Wan & Fouad, 2018). In conclusion, by incorporating the assumptions of COR theory into the JD-R model, we hypnotized that WFC and FCW are positively related to employees' burnout, which, in turn, is positively associated with TI.

Method

Participants and Procedure

Participants were 182 employees (51.6% female) from Banja Luka, aged 20 to 62 (M = 35.20, SD = 9.93), with a length of service from 1 to 41 years (M = 9.93, SD = 8.47). Participants' level of education ranged from a secondary school degree (20.3%), a college degree (4.9%), and a university degree (51.1%) to a master's and PhD degree (11.5%). Regarding marital status, 44.5 % are married.

Data were collected in organizations during working hours using a paper-and-pencil format. Completing the questionnaire was conducted individually. Participation was on a voluntary and anonymous basis.

Instruments

Work-Family Conflict Scale (Netemeyer, Boles & McMurrian, 1996). This 12-item scale includes six items assessing work-family conflict and six considering family-work conflict. Participants answered on a 7-point Likert scale. For this study α =.81 for work-family conflict and α =.90 for family-work conflict.

Oldenburg Burnout Inventory (Demerouti & Bakker, 2008, adapted by Burić & Slišković, 2018). This inventory consists of 16 four-point Likert-type items. For this study α =.78.

Turnover Intention Scale (Popov, 2009). The scale consists of 3 five-point Likert-type items. For this study α =.90.

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		
					WFC	FWC	BT
WFC	1.86	1.05	2.00	2.00	-		
FWC	3.30	1.08	.10	-.29	31**	-	
BT	2.13	.76	-.00	.18	.30**	.49**	-
TI	2.19	1.24	.73	-.65	.23*	.27**	.62**

Note. WFC – Work-family conflict; FWC – Family-work conflict; BT – Burnout; TI – Turnover intention.
** $p < .001$, * $p < .01$

The bivariate correlations between the WFC, FWC and burnout are positive and of moderate intensity. The correlations between WFC, FWC and TI are positive and weak, while the correlation between burnout and TI is positive and strong (Cohen, 1988).

We used Jamovi (version 1.2) GLM package (JAMM module) for mediation analysis, and the results are shown in Figure 1 and Table 2.

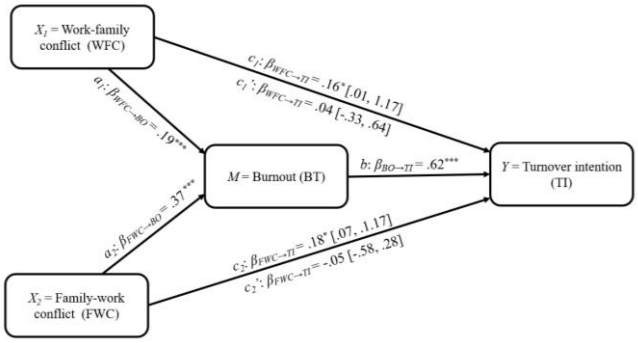

Figure 1: Standardized path coefficients for the mediation model, Work-family conflict (X_1) and Family-work conflict (X_2) on Turnover intention (Y) through Burnout (M). *Notes:* ***$p < .001$; *$p < .05$; CIs were obtain using $k = 10\,000$ bootstrapping samples.

Results showed that the WFC and FWC did not directly predict TI. By introducing burnout as a mediator, we estimated a significant indirect effect of WFC and FWC, which indicates that higher WFC and FWC contribute to higher employee burnout, leading to higher TI. Therefore, we can conclude that the relationship between WFC and FWC, and TI is fully mediated by burnout.

Table 2: Indirect, direct, and total effects of the mediation model, work-family conflict and family-work conflict on turnover intention through burnout

Effect	Paths	B	SE	95% CI		β	z	p
				Lower	Upper			
Indirect	WFC → BO → TI	.44	.18	.09	.78	.12	2.467	.014
	FWC → BO → TI	.72	.17	.39	1.04	.23	4.334	< .001
Component	WFC → BO	.09	.04	.02	.17	.19	2.572	.010
	BO → TI	4.65	.53	3.60	5.69	.62	8.724	< .001
	FWC → BO	.15	.03	.09	.22	.37	4.993	< .001
Direct	WFC → TI	.15	.25	-.33	.64	.04	.621	.535
	FWC → TI	-.15	.22	-.58	.28	-.05	-.684	.494
Total	WFC → TI	.59	.30	.01	1.17	.16	1.989	.047
	FWC → TI	.57	.25	.07	1.06	.18	2.255	.024

Note. WFC – Work-family conflict; FWC – Family-work conflict; BT – Burnout; TI – Turnover intention.

Discussion and conclusion

The results of the correlation analysis are consistent with the results of previous studies (e.g., Arlee & Luk, 1996; Blanco-Donoso et al., 2021; Cañadas et al., 2018; Ghayyur & Jamal, 2012; Greenhaus, Parasuraman, & Collins, 2001; Netemeyer, Boles, & McMurrian, 1996), showing a positive relationship the WFC and FWC with burnout and TI, and positive relationship between the burnout and TI.

As the main finding of this study, the mediation analysis results showed that the relationship between WFC and FCW, and TI is fully mediated by burnout. This finding has three significant theoretical implications. First, this finding supports the JD-R model's extension, i.e., the inclusion of non-work-related factors in the model as antecedents of work-related outcomes. Second, the results empirically support burnout's mediating role in the JD-R model. Third, these findings provide empirical evidence to support the COR

theory. The obtained result indicates that higher WFC and FWC contribute to higher employee burnout, which, in turn, leads to higher TI. This finding confirms that a lack of resources depletes other resources and that people become defensive to protect themselves, recover from resource losses, and regain well-being (Hobfoll, 2002).

Although our results imply that the impact of work-family conflicts on employee TI is rooted in burnout, it is unclear how much the different dimensions of burnout (e.g., emotional exhaustion, depersonalization, reduced personal accomplishment, disengagement from work, etc.) contribute to employees' TI and which ones are the most significant. Future research should therefore close this gap.

Employee turnover is one of the most difficult challenges for organizations. Turnover costs an organization a lot of money and hurts its efficiency, effectiveness, and overall performance (Seligman, 2011; Shaw, 2011). Understanding the factors and mechanisms of TI is critical for developing intervention strategies to reduce TI. The finding of this study suggest that the organization's management should provide strategies for improving the work-life balance to reduce TI.

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Constructing the Notion of Doing Mathematics in Transition from the First to the Second Cycle of Elementary Education

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Abstract

The study deals with te phenomenon of deterioration of outcomes of mathematics education throughout schooling by looking at how mathematics is constructed in transition from class teaching to subject teaching mathematics. A total of 220 students from grades 4 and 5 wrote stories about a peer doing mathematics and write a letter to a peer who has not yet encountered (fifth-grade) mathematics. Thematics analysis revelied that the studens predominantly wrote stories about negative experiences with mathematics, such as stress, failing, need for help, or being shamed, while one third of stories depicted flow experiences. Letters emphasized the importance of self-regulation for doing math, positive view of mathematics, but also warnings about mathematics being the most difficult subject. The gender of the writer, the protagnost of the story or the recipient of the letter was not related to the choice of the themes, suggesting that gendered construction of mathematics appear developmentaly later. Fifth-grades more often than four graders depicted negative themes confirming that subject teaching mathematics might be more restrictive than class teaching. The choice of theme was related to the final math grade and the attitude towards mathematics, suggesting a reciprocial cycle between beliefs about mathematics and outcomes of learning mathematics. Results imply a need for more inclusive approach to mediating and teaching mathematics.

Keywords: narratives; mathematics; dynamic storytelling; elementary education; students

Introduction

Outcomes of mathematics education, such as motivation, positive emotions and relative performance, tend to deteriorate as students progress through schooling (e.g., Gottfried et al., 2007). Serbian students at the end of primary education perform in international studies above the average (Mullis et al., 2020), but their mathematics performance at the beginning of upper secondary education declines (OECD, 2019). Likewise, fourth graders show higher self-efficacy and interest in math learning than students at the beginning of upper secondary education. A recent study has found that Serbian students in grade four perceive themselves less as "math persons" than their younger peers (Radišić et al., under review).

One way to approach the deterioration of the outcomes of mathematics education is to look at how mathematics is being *mediated* (Wertsch, 2009) to students at different levels of education. Mathematics has a long tradition of being presented as an elite field (Lerman, 2000; Ernest, 2013), accessible only to exceptional individuals (Ellis & Berry, 2005), who are more likely to be male (Solomon, 2007). Students' ideas of mathematics and themselves as mathematics learners impact how they engage with the subject and, consequently, shape their mathematics competence. During the first cycle of compulsory education, mathematics is often introduced to the students from a more constructivist perspective - through curricula, textbooks, and teachers' ideas of mathematics and teaching. However, in the second cycle, with subject teaching, these mediators of mathematics often come with a more absolutist view (Dossey, 2006; Nickson, 2006). Thus, values and meanings that students use to organize their understanding and experience of mathematics often become more restrictive as students start the second cycle of compulsory education.

This narrative study explores how elementary school students construct their notion of doing mathematics. It also examines whether those ideas differ at the end of the first and the beginning of the second cycle of compulsory education and how they relate to gender.

Method

Sample

A total of 220 fourth- and fifth-graders (32% fourth grade; 46% boys) from five elementary schools participated in the study.

Data collection

Dynamic storytelling (Daiute & Kovač-Cerović, 2017) was used to elicit narration in two genres. Students were instructed to write a story about a peer doing mathematics and write a letter to a peer who has not yet encountered (fifth-grade) mathematics. The gender of the story's protagonist and the recipient of the letter were randomly assigned to each participant. The instrument included general questions, a question on math grades, and a 10-point scale for rating the attitude towards mathematics.

Data analyses

Thematic analysis was used to identify the main themes of the narratives. Chi-square and ANOVA with LSD post hoc tests were used to check for the differences related to gender, grade, achievement, and attitudes towards mathematics.

Results

Main themes

Most of the story plots assume that the protagonist faced an obstacle while doing mathematics. In 20% of such narratives, a protagonist is *seeking help* (e.g., "*The little girl is having a hard time doing homework. She calls her friends to help her a little, but they are playing. Ultimately, her parents came late from work and did not have time to help. So she went to school not knowing if she did well.*"). Some 15% of narratives depicted the protagonist as being *stressed* out while doing mathematics (e.g., "*A boy is doing math problems in class. He has a lot of anxiety because it is about multiplying and dividing a six-digit number by a three-digit number. He is thinking about not making a mistake, and suddenly a huge fear arises.*"). 7% portrayed a protagonist as *failing* mathematics (e.g., "*Marko was once doing math problems at home and had difficulty solving the last one. He got angry and wrote a random number. The teacher scolded him and said that he'd have problems in the 5th grade because of this. He didn't listen and had problems in the 5th grade."*), while 5% presented a group of students *shaming* a protagonist for succeeding in mathematics (e.g., "*A girl named Elena was doing math problems at school. Some boys approached her, yelling "NERD"!!! It didn't bother her because she was self-confident."*). The rest of the stories (35%) depicted the protagonist passionately doing math, often conveying a heroic image and *flow* experience (e.g., "S*he loved to study a lot, and she especially loved to do math homework. She is doing it very well. She is surrounded by her good friends who support and respect her*.")

Three types of letters were identified: 53% emphasized the importance of *self-regulation* for success in mathematics (e.g., "*You must practice at home with mom and dad or with a good friend. It is important to read each task carefully, and you must check the result every time. Mathematics cannot be learned like a poem.")*, and 28% *positively* depicted mathematics (e.g., "*Focus a lot of attention on math. It is a subject that will give you a lot throughout your life because we always need to add and subtract something. It is a fascinating subject. First, learn the numbers correctly; once you learn them, everything will gradually follow.*"). In contrast, 9% *warned* their peers that mathematics is difficult (e.g., "*Mathematics is very demanding. It would be best if you prepared a lot for that subject. Expect to work hard for that subject. Mathematics is perhaps the most difficult subject. Pay special attention to multiplication and division. You really need that in your life. Be careful.*").

Gender differences in depicted themes

Whether the protagonist is a boy or a girl was not related to the main theme of the story ($\chi 2(4, 175)=5.964$, $p=.202$), and the gender of the recipient of the letter was not related to the main theme of a letter ($\chi 2(2, 185)=2.997$, $p=.223$). Likewise, there was no writer gender effect on the main theme depicted in a story ($\chi 2(4, 175)=.968$, $p=.914$) or the letter ($\chi 2(2, 185)=.217$, $p=.897$).

Grade differences in depicted themes

Four- and fifth-graders differed in the themes they depicted in both stories ($\chi 2(4, 175)=9.986$, $p=.041$) and letters ($\chi 2(2, 185)=13.480$, $p=.001$). Fifth graders wrote more about stress (28.8% vs 12.9%) and failing (12% vs 3.4%) than four-graders did ($p<.05$). When writing letters, fifth graders more often emphasized self-regulation (68% vs 50.8%) than four-graders who depicted a positive view of mathematics (44.4% vs 19.7%) more frequently ($p< .05$).

Mathematics achievement and depicted themes

Table 1 shows average grade, attitude values, and standard deviations per story and letter theme. The final grade in mathematics was related to the theme a student depicted in both the stories ($F(4, 174)=3.512$, $p=.009$) and the letters ($F(2, 184)=3.832$, $p=.023$). LSD test showed that students who wrote about failing had significantly lower average grades than students who wrote about the flow experience ($p=.003$) and help-seeking ($p=.003$). In contrast, students who wrote about the flow had higher average grades than students who wrote about shaming ($p=.026$) and stress ($p=.033$). Similarly, students who wrote warnings about mathematics had lower grades than those who wrote about self-regulation ($p=.013$) and depicted a positive view of mathematics ($p=.007$).

Table 1. Average grade and attitude values and standard deviations per each story and letter theme

Theme	Grade		Attitude	
	Mean	S.D.	Mean	S.D.
Failing	3.938	1.124	5.875	3.160
Flow	4.627	.610	8.267	1.796
Seeking help	4.452	.861	8.286	1.852
Shaming	4.000	1.414	7.800	1.874
Stress	4.250	.842	8.125	1.947
Positive view	4.558	.698	8.558	1.602
Self-regulation	4.470	.851	7.870	2.393
Warning	3.944	.998	6.000	1.715

Mathematics attitude and depicted themes

Mathematics attitude was related to the depicted theme in both the stories ($F(4, 174)=5.133$, $p=.001$) and the letters ($F(2, 184)=9.550$, $p=.000$). Students who wrote about failing rated their attitude less than students who depicted other themes ($p<0.02$; see Table 1). Similarly, students who wrote warnings had lower ratings than students who had a positive view ($p=.000$) or emphasized self-regulation ($p=.001$).

Discussion and conclusion

The students most often portrayed mathematics experience as negative, like many studies have found (e.g., Dündar et

al., 2014). The results indicate that gender-related mathematical discourses are not differentiated in grades four and five, and it seems that, developmentally, they appear later. Five-graders wrote more often about negative topics than four-graders. This follows the expectation that subject-teaching mathematics is mediated as stricter and more exclusive than class mathematics and in line with findings that show deterioration of mathematics outcomes. Results showing that students who depicted the most negative themes had the lowest grades and math attitudes likely uncover a reciprocal relationship (Putwain & Wood, 2023). Namely, students' negative ideas of mathematics and themselves as mathematics learners probably hamper learning, which further impacts performance, i.e., grades. This then served as feedback that maintains negative thoughts on mathematics that impact learning. Establishing a more positive view of mathematics and breaking this vicious cycle requires a more inclusive approach to teaching/mediating mathematics and letting go of traditional mathematics learning assumptions that assume fixed mindsets, elitism, and absolutism.

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Same Situation Seen Differently: Covid-19 and Teaching/Learning at Agricultural Faculties in Croatia, North Macedonia, Bulgaria, and Serbia

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Abstract

The aim of this study is to compare the attitudes of teachers and students from different Higher Education (HE) institutions about online classes. The online survey has been conducted with 123 teachers and 362 students from agriculture faculties in Belgrade (Serbia-UB), Osijek (Croatia-UNIOS), Stara Zagora (Bulgaria-TrU), and Skopje (North Macedonia-UKIM). Results indicate that teachers and students in our study were aware that online teaching has its potential and limitations. Teachers were more positive toward online classes than students, although they were aware that students cannot master practical skills. The majority of students believe that online learning did not contribute to their: learning outcomes (43%), learning efficiency (50%), communication and cooperation (52%). Teachers from all HEIs emphasized the weaker ability to control students' independence in the examination situation as the most important problem of online assessment. Teachers and students have different judgments about the emotional correlates of online learning: among other aspects, students find that online learning is connected to loneliness (46%) and depression (32%). The majority of teachers (80%) disagree that online teaching is a potential risk to students' loneliness and depression. Despite the specificity of the educational context at different universities, students' perception of online teaching/learning is more similar than teachers and is generally somewhat more critical. The findings also point to one typical problem in HE - teachers need to recognize and respect the student's perspective, regardless of the medium in which classes were organized.

Keywords: Emergency remote teaching/learning, Covid-19, Higher education, Students' perception on teaching/learning, Teachers' perception on teaching /learning

Introduction

During the Covid-19 pandemic, most countries have moved to some form of remote learning, named as **'emergency remote teaching/learning'** (ERT) (Anderson, 2021; Ferri, Grifoni, & Guzzo, 2020; Hodges et al., 2020; Milman, 2020; Rapanta, Botturi, Goodyear, Guàrdia, & Koole, 2020). Because teachers must improvise quick solutions urgently, that situation causes stress for many teachers.

Given that the situation lasted for two years, we assume that higher education teachers (HE) adjusted their curricula, the way of communicating with students, the forms of student assessment and the design of assignments. At the same time, we assume that the students have built some new learning strategies. Both teachers and students were certainly able to build an attitude and perspective towards this type of teaching during the two years.

For teaching/learning in applied sciences, Covid-19 has been a particular challenge since a significant part of studies is based on practice and field work, authentic, hands-on, skills-based, and contextualized instruction through experiential learning and laboratory-based approaches. Transition to remote teaching/learning in response to the COVID-19 pandemic removed much of the contextualized and hands-on experiences for most students and teachers within classrooms and laboratories (McKim, Sorensen & Burrows, 2021). The aim of this study is to compare the attitudes of teachers and students from different HE institutions about online classes. Specifically, we examined teachers' attitudes about online teaching; Students' attitudes about online teaching; The effects of online teaching during the pandemic on students (students' and teachers' perspectives); Achievement of students in online teaching/learning (students' and teachers' perspectives); Differences between educational contexts related to attitudes toward online teaching.

Method and Sample

In spring 2022 the online survey has been conducted with 123 teachers and 362 students from agriculture faculties in Belgrade (Serbia-UB), Osijek (Croatia-UNIOS), Stara Zagora (Bulgaria-TrU), and Skopje (North Macedonia-UKIM). The applied questionnaire was a composite one, composed of several parts that examine teachers' and students' attitudes and practices regarding teaching, learning and online learning before and during ERT.

The teachers who participated in the research had different titles (from Assistant to Full professor), they were 49 (40%) male and 74 (60%) female, and had different

affiliations: University of Belgrade (UB) 26 (21%); University of Josip Juraj Strossmaier in Osijek (UNIOS) 50 (41%); Ss. Cyril and Methodius University in Skopje (UKIM) 16 (13%); Trakia University (TrU) 31 (25%). Regarding their preparedness for ERT online teaching, 58% of teachers did not have any form of pedagogical-psychological training during their work at the faculty, and 61% of them did not have any form of training that dealt with the application of ICT in the past 5 years.

The sample of students was convenient and does not reflect the number of them enrolled at these universities: UB 91 (25%); UNIOS 76 (21%); UKIM 27 (8%); TrU 168 (46%). There were 129 (36%) male and 233 (64%) female students who attend different years of study.

Results and Discussion

Teachers' and students' attitudes about ERT/learning

From the teachers' perspective, the most changes during ERT happened in the type of communication with students (UB-42%; UNIOS 36%; UKiM- 38%; TrU-52%). At the same time, according to teachers, the teaching content has changed the least: (UB-50%; UNIOS -34%; UKiM- 38%; TrU-52%).

In several Likert-type questions, teachers rated how much they agreed with each statement describing some aspect of online teaching and student learning in these settings. The majority of teachers from all universities fully agree with many statements that indicate the negative consequences of online teaching: reduced student participation in teaching activities 58 (47%); lower quality of students' knowledge and skills 50 (41%); decreased motivation of students to learn and work in teaching 51 (47%); reduced opportunity for collaboration in learning 54 (44%); the teachers know less about their students 78 (63%); reduced communication between teachers and students 66 (54%); reduced communication about teaching issues with colleagues 55 (53%). The majority of teachers (68%) believe that online teaching makes it difficult to prepare students for the job they are studying for.

At the same time, the majority of students from all universities fully agree that online learning did not contribute to their: learning outcomes (43%), learning efficiency (50%), communication and cooperation (52%), and the regularity of class attendance (48%). They also believe that their motivation for learning decreased (48%).

It seems that students and teachers agree about several aspects of online teaching and learning.

Table 1: Teacher's perspective on the conditions and their competencies needed for effective online teaching,

Teachers' attitudes about ERT	Disagree	Neutral	Agree
Insufficient technical possibilities available to students	42 (33%)	46 (37%)	35 (19)
Insufficient technical possibilities available to teachers	62 (50%)	31 (25%)	30 (24%)
Insufficient support for the implementation of online teaching at the faculty	45 (36%)	42 (33%)	36 (29%)
Insufficient digital competencies of teachers	78 (64%)	25 (20%)	20 (16%)
Insufficient digital competencies of students	54 (44%)	42 (43%)	27 (22%)
Students inadequate home conditions for studying	37 (30%)	64 (52%)	22 (18%)

Most teachers do not agree that they had insufficient competencies needed for effective online teaching or that they had insufficient technical requirements. The majority of teachers had a neutral attitude about students' home technical conditions for ERT (we believe that they do not know the conditions in which students lived), and only a minority (22%) of teachers believe that students have insufficient digital competence. On the contrary to that teacher perception, empirical studies during the pandemic clearly show the difference between digital literacy and *digi-pedagogical skills* of students and teachers. Being a digital skillful does not directly equate to being a digital learner, e.g., having developed the competence to use this literacy in a formal or informal educational setting. This emerged in remote teaching analysis that students lack the needed digi-pedagogical skills to succeed in an online learning context or to even follow an online course. (Gallardo-Echenique, Marqués-Molías, Bullen, & Strijbos, 2015).

Teachers evaluated the extent to which particular educational objectives may be successfully attained in an online setting. Regardless of the faculty where they work, teachers assessed that online teaching/learning made it easier to attain "theoretical" educational goals in a higher percentage. These objectives describe the learning of declarative knowledge, or verbal content, such as: learning professional terminology (53%), learning specific information and data (55%), and learning concepts (63%). On the contrary, the majority of teachers (61%) believe that mastering practical skills, cannot be reached in an online environment), and that was the most challenging educational goal to fulfill during ERT. In other words, when the online environment presents a challenging backdrop for the

fulfillment of specific educational goals, teachers feel less confident in what can be done.

Assessment of students' achievements (knowledge, skills, values) online.

During the pandemic, 73% of teachers examined students online. Teachers from all HEIs emphasized the weaker ability to control students' independence in the examination situation as the most important problem of online assessment. Almost half of teachers from all HEI contexts 56 (46%) commented on the increase in non-academic behavior (plagiarism, cheating, etc.) "Plagiarism is the most serious of academic misbehaviors, but the pressure to achieve desired outcomes can blur the ethics for the overly ambitious." (DeBard, 2004, p.43). This, which is already characteristic of "millennials", has worsened even more during the pandemic (e.g: Erguvan, 2021; Durak et al., 2021; Harwell, 2020; Lopez & Solano, 2021).

Regarding to overall students' achievement, teachers from different universities have different judgments: the UB (42%) and the UNIOS (34%) teachers find that the achievement of students is weaker (it is congruent with the findings of other research), UKIM teachers think that students' achievement remains the same and 38,8% of teachers from Trakia University think that success of students has improved. It would be interesting to find out what shaped this perspective of TrU teachers, but the research evidence suggest that ERT did not produce as much learning as in face to face studying prior to the pandemic. It has resulted *in actual learning losses*, students learning less than would be expected based on the prior year's data *and increases in inequity* in education even in the most developed countries (Bielinski et al., 2020; Donnelly & Patrinos, 2020; Dorn et al., 2020; Kuhfeld et al., 2020; Pešikan, Niemi, & Devetak, 2021; Turner, 2020). Research analyzing these outcomes is ongoing, but alarmingly, these losses are found to be much higher among students from socio-economically disadvantaged families and backgrounds.

At the same time, from the students' perspective, teachers were setting reduced criteria in exams and colloquiums. This was impression for half of students in our study 181 (50%).

Motivational and emotional correlates of online teaching and learning

Teachers and students disagree in evaluating teachers' motivation for online teaching. While the majority of teachers disagree with the statement that online teaching „Decreased motivation of teachers for work with students" 54(44%), the majority of students of UNIOS assessed that their teachers are moderately motivated for online teaching (52.6%). Conversely, UB (39%) and NM students (48%) rated their teachers as unmotivated for online teaching. At the same time, teachers and students similarly assess decreased students' motivation for studying in an online setting - students 174 (48%) and teachers 51 (47%). Decrease of learning motivation is not an unexpected finding. The greater flexibility available in ERT learning places high demands on the learner's ability to regulate their learning and motivation (Adam et al. 2017; Fryer and Bovee 2016; Fryer et al. 2014) and thus poses an increased risk of passive procrastination (Pešikan et al., 2021: 4).

Teachers and students in this research differ the most in their attitudes related to the emotional correlates of online teaching and learning, that is, what are the effects of online teaching on students' mental health. This discrepancy between teachers and students is shown in Table 1.

Table 2: The effects of online teaching/learning - students' vs. teachers' perspective

Effects of online teaching/learning on emotions and mental health of students	Students	Teachers about students
Source of depression	114 (32%)	10 (8%)
Insufficient social and emotional exchanges & loneliness	166 (46%)	26 (21%)
Confusion	160 (44%)	32 (26%)
Excessive workload and requirements	111 (31%)	12 (10%)
Greater level of student independence	138 (38%)	28 (23%)
Increased student confidence in using ICT	65 (18%)	39 (32%)

Mental health problems are a leading barrier to academic success. Mental illness can affect students' motivation, concentration, and social interactions, which are critical factors for student success in higher education (Unger, 2007). There is enough evidence that the stress experienced by both students and teachers has increased during the pandemic (Elmer, Mepham, & Stadtfeld, 2020; Son, Hegde, Smith, Wang, & Sasangohar, 2020). The pandemic situation is closely related to anxiety, the uncertainty resulting from the situation and the struggle to maintain a healthy learning-life balance, loneliness, and depression (Misirlis, Zwaan, & Weber, 2020). Students also indicated that being in close quarters with their families led to increased stress and arguments. All these are contributing factors to the decrease in students' academic performance and overall education experiences.

The findings also point to one typical problem in HE - teachers need to recognize and respect the student's perspective, regardless of the medium in which it is realized.

Conclusion

Teachers and students in our study were aware that online teaching has its potential and limitations. During the Covid-19 pandemic, by switching to ERT/learning, teachers changed to a greater extent the types of activities and tasks for students, communication with students. The contents of teaching/learning have changed the least.

Despite the specificity of the educational context at different universities, students' perception of online teaching/learning is more similar than teachers and is generally somewhat more critical. Most students think that online teaching/learning does not have enough social and emotional exchange; that the exchange with other students and teachers is less intensive; that there is more confusion. In summary, students are very critical of the potential of online teaching, and this should be taken into account, especially in situations of common prejudices, as "millennials" are very receptive and a priori positively oriented towards educational technologies (e.g., Gibson, & Sodeman, 2014; Deal, Altman & Rogelberg, 2010; Kury et al., 2018). This indicates the need for teachers to get to know the perspective of students better when it comes to teaching in general, but also teaching in an online environment.

Although, teachers from different HEIs assessed students' achievement in different ways, the majority of them find that the achievement of students is the same comparing pre-pandemic and post-pandemic periods. The teachers were aware that online teaching cannot prepare students for practical professional work, but they believe that it can be a good supplement to regular teaching. This somewhat contradictory attitude of teachers about the effects of online teaching should be further examined in future research.

As the first and most important problem of assessment in the online environment, teachers emphasized the weaker ability to control students' independence in the examination situation. This fits in with broader findings on the impact of the pandemic on education, which point to an increase in the practice of cheating among students.

Generally, we are still far from a good understanding of the learning process in an online environment. The development of technology and the rich selection of digital tools cannot solve the main pedagogical issue: how to use technology wisely and rationally to support the learning/teaching process.

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Beyond the Grade Point Average: Measuring a Broader Set of University Students' Achievement Markers

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Abstract

University students' academic achievement is typically represented by the Grade Point Average – GPA. However, student success is not synonymous with the GPA, and an argument can be made that obtaining an internship or scholarship, being a tutor to others, getting a paper published, etc., can all be viewed as markers of extended student achievement. We wanted to explore how a 'broader set of 15 achievement markers' (abbrev. BAM) is related to the GPA, as a 'traditional' measure of achievement. Furthermore, we wanted to determine if the BAMs are correlated with the know determinants of achievement, namely intelligence and Conscientiousness (C). The sample consisted of 228 University of Banja Luka's students. The results show that BAMs were not correlated with the GPA, and that they were weakly, but consistently negatively correlated with intelligence and C. Their values were also inflated, with the average achievement rates of almost 9/15. This points to a peculiar, perhaps even worrying trend of 'negative selection', where many of the broader achievement markers and incentives offered to students (e.g., scholarships), that should be earned by knowledge, ability, persistence, and dedication, could arguably be achieved relying on the opposite, and achieved too easily.

Keywords: grade point average (GPA); broader student achievement markers; Big 5 personality; intelligence

Introduction

University students' academic success is typically represented in research by the Grade Point Average – GPA (Cassady, 2000; Imose & Barber, 2015; Kuncel et al., 2005; Noftle & Robins, 2007). However, student excellence is not necessarily synonymous with the GPA, as it only modestly predicts later job performance and success (Imose & Barber, 2015). This might, in part, be due to research overrelying on the self-reported GPAs, which can be unreliable (Cassady, 2000; Kuncel et al., 2005). Median grades assigned by different professors and departments tend to be inflated and vary substantially, which can complicate direct comparisons and predictions (Johnson, 1997). Alternative scoring procedures have been proposed to correct these 'technical' GPA shortcomings (Johnson, 1997), but they do not address a conceptual 'narrowness' of the GPA, as it measures only performance aspects directly related to the curriculum, which mostly encompasses 'hard' skills (i.e., specific profession related knowledge; Lamberti et al., 2021).

Activities external to the core curriculum are called extra-curricular activities (Seow & Pan, 2014). Some of them can lead to obtaining useful life and 'soft' skills (i.e., a broad collection of knowledge useful in many professions; Lamberti et al., 2021), which can be valuable in a real-world market economy (Balcar, 2016; Currie et al., 2012; Robles, 2012). Prior research has established positive correlations of several life skills and the GPA (Currie et al., 2012). Broader impact that extra-curricular activities can have on the academic performance has also been considered (Seow & Pan, 2014) – depending on context, it can be negative, indirectly positive, or positive to a certain point, after which it becomes a negative.

An argument can be made that student activities such as: obtaining an internship or scholarship, being a tutor to other peers, getting a paper published (outside of the mandatory course requirements), receiving an award etc., can all be viewed as broader aspects of (academic) achievement. These activities are typically not graded, thus not contributing to the actual GPA. However, they are also not necessarily extra-curricular, as many are curriculum-adjacent. We wanted to explore how such 'broader set of achievement markers' (abbrev. BAM) might be related to a 'traditional' measure of academic achievement, i.e. – GPA. Furthermore, we wanted to determine if the BAMs are correlated with known determinants of achievement in a similar way that other achievement metrics would. Specifically, as aspects of achievement, BAMs should be related to higher intelligence (Coyle & Pillow, 2008; Richardson et al., 2012; Roth et al., 2015) and higher Conscientiousness (C) (Noftle & Robins, 2007; Poropat, 2009; Richardson et al., 2012).

Method

The sample was 228 University of Banja Luka's (Republic of Srpska) students (71% women; age: M=22.93, SD=2.71 years), from 8 fields of study, roughly proportionally encompassing natural and social sciences and humanities. Only students from the 2nd year and up were included (with 47% being 3rd year). Testing was done using pen & paper procedure, in small groups or individually.

Participants self-reported their GPA (M=8.07, SD=0.82) & BAMs – using a 15-category yes-no check-list (Table 1) specifically developed for this research.

Participants' Big 5 personality traits (namely C) were measured via brief (15-item) BFI-S scale (Lang et al., 2011).

Intelligence was assessed using a combined test (ω=.84) of matrix (11 tasks) and numerical reasoning (13 tasks) and verbal analogies (15 tasks). The first two tests were selected from the ICAR repository (Condon & Revelle, 2014); the matrix test has already been validated in Serbian culture (Subotić et al., 2020). Verbal analogies test was taken from Budiša et al. (2021), where it demonstrated good validity.

Results

Parallel analysis (Subotić, 2013) suggested that 15 BAM categories (see Table 1 for descriptions) can be grouped into a single latent factor (Lorenzo-Seva & Ferrando, 2013) (60% common variance, M_{Λ}=.73, $M_{r\_inter.item}$=.42, ω=.95), with only #10 category having lower loading (Λ=.29). This justified calculating a total summary BAM score (note: we opted to retain #10). All 15 BAMs are fairly prevalent, ranging from 51% for #3 to 63% for #7 – or 58% on average (total BAM: M=8.75, SD=4.99).

Total BAM score does not correlate with the GPA: r=.01, p=.886 (the correlation is functionally identical if adjusted for the year & field of study). The only individual BAM category related to GPA is #10: r=.16, p=.017. Total BAM score correlates negatively with intelligence (r=-.13, p=.042) and C (r=-.14, p=.029), while the GPA correlates positively with both: r=.26, p<.001, & r=.18, p=.006.

Almost all individual BAMs (Table 1) correlate negatively (significantly or not) with intelligence and C. The effect sizes are small and only several correlations remain significant after the FDR multiple testing adjustment (Benjamini, & Hochberg, 1995).

Table 1: Correlations of BAM categories with intelligence and C.

BAM categories	$r_{Int.}$	r_C
#1 Volunteering	-.05	-.12
#2 Attending (informal) educational workshops	-.02	-.14*
#3 Current scholarship	-.16*,†	-.15*
#4 Previous scholarship	-.19$^{**,\pm}$	-.18$^{**,\pm}$
#5 Published popular science or professional article	-.17*,†	-.09
#6 Published scientific article	-.14*	-.07
#7 Presented conference paper	-.12	-.08
#8 Attended summer school or exchange	-.08	-.08
#9 Had an internship	-.05	-.17$^{**,\pm}$
#10 Did not Fail/repeat a year	-.06	-.01
#11 Assisted professors in teaching process	-.21$^{**,\pm}$	-.06
#12 Tutored peers (curriculum-related)	.01	-.10
#13 Tutored peers (outside curriculum)	-.05	-.02
#14 Awards for extra-curricular achievement	-.07	-.13*
#15 Awards for academic achievement	-.15*	-.11

Notes: * p<.05, ** p<.01. ± effect significant after FDR correction; † effect bordering on significance (.05<p<.07) after FDR correction.

Discussion

The results of this study are arguably surprising. The set of 15 broader (academic) achievement markers we examined is functionally unrelated to GPA, and unlike GPA, which correlates with higher intelligence (Coyle & Pillow, 2008; Richardson et al., 2012; Roth et al., 2015) and higher C (Noftle & Robins, 2007; Poropat, 2009; Richardson et al., 2012), as a measure of achievement expectedly should, BAM total score (and almost all categories), correlates negatively with intelligence (notably: receiving scholarships & awards, article publishing, assisting professors in teaching) and C (notably: receiving scholarships & awards, having internships, and attending workshops). All of this is weak evidence, as most correlations do not reach statistical significance, or retain it after probability adjustments. Still, they do point to a peculiar, perhaps even worrying trend of 'negative selection', where many of the broader achievement markers and incentives offered to students (e.g., scholarships), that should be earned by knowledge, ability, persistence, and dedication, could arguably be achieved relying on the opposite.

Valuing soft skills can correlate with lower intelligence, i.e., lower ability students could use them to 'compensate' their disadvantages (Chamorro-Premuzic et al., 2010). Higher C students can also use them to boost their academic performance (Chamorro-Premuzic et al., 2010). However, we determined that many BAMs represent both low ability & low C strategies of obtaining achievement, obviously too easily (as they show inflated achievement rates), and perhaps even using non-meritocratic ways (e.g., 'tagging along' on papers).

We won't generalize the results beyond the University of Banja Luka & the Republic of Srpska[1]. However, we currently cannot recommend using a proposed list of broader achievements as a useful metric. Reasons & criteria for being able to so easily publish, obtain scholarships, etc. should also be explored further.

[1] Currently, many governmental scholarships in the Republic of Srpska can be obtained based on the non-academic criteria.

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Expectancy, Value, and Cost as Predictors of Student Achievement in Late Elementary School Students

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Abstract

According to the Expectancy-Value-Cost (EVC) model, motivation is a combined product of: 1) students' expectations (E) about their ability and future success; 2) students' perceived value (V) of a task; 3) students' perceived cost (C), i.e., negative consequences of engaging in a task. In this study, we wanted to test how the EVC model predicts the current GPA of late elementary school students. The sample comprised 306 elementary school students from the 8th and 9th grade. General school achievement was represented by the GPA from just finished previous semester (used as a criterion) and from the previous school year (used as a predictor). The results showed that EVCs alone predicted 25% variance of the previous semester's GPA, with significant predictive contributions from E and C, but not V. Furthermore, the EVCs explained a small but significant amount of variance (3%) in the semestral GPA, above the effect attributable to the previous year's GPA, with significant unique contributions of E and C. These results show that when assessing the EVCs for the school learning in general (rather than making the assessments for individual school subjects), and when predicting overall achievement, students' value judgements aren't useful for explaining their actual achievement. However, global expectations and cost assessments can be useful, as they can partially explain the differences between current and previous achievement.

Keywords: expectancy, value, cost, student achievement, elementary school

Introduction

Motivation is one of the key factors of academic success (Howard et al., 2021; Kriegbaum et al., 2018; Nauzeer & Jaunky, 2021). Motivation framework often used in school context is the Expectancy-Value, or more recently – the Expectancy-Value-Cost (EVC) model (Barron & Hulleman, 2015; Kosovich et al., 2015; Jiang & Zhang, 2023). The model's basic assumption is that students with high competence and value beliefs for academic tasks are more likely to have higher achievement (Wigfield & Eccles, 2000). Specifically, the EVC model defines motivation as a product of three main components: 1) Students' expectations (E) about their ability and probability of success in the future (Baron & Hulleman, 2018; Eccles et al., 1998), which is often used interchangeably (Bong, 2001; Jiang et al. 2018; Rosenzweig et al., 2019) with a similar construct of self-efficacy (Talsma et al., 2018). 2) Students' perceived value (V) or 'usefulness' (i.e., interest, attainment, or utility) of a task, or engaging in it (Panizo et al., 2015). 3) Students' perceived cost (C), i.e., negative consequences of engaging in a task (Rosenzweig et al., 2019), including the effort required to perform a task successfully, lost opportunities to engage in other valued tasks, ego threats associated with potential task failure, and negative emotions associated with task engagement (Barron & Hulleman, 2015; Eccles et al., 1983). The C component has been only recently upgraded from a subcomponent of V, to a main model's component, and its role has not yet been thoroughly studied (Barron & Hulleman, 2015).

The EVC model performs well when predicting academic achievement at high school & college level, namely for the individual school subjects (Jiang et al. 2018; Panizo et al., 2015; Gong et al., 2022), given that students' motivation beliefs tend to be highly domain-specific (Gaspard et al., 2018). Furthermore, with rare exceptions (e.g., Jiang et al. 2018), there is not much data on the EVC's predictivity at earlier ages, but research shows that academic motivation tends to decline over the years, while students' C perceptions in many subjects tend to increase (Gaspard et al., 2018).

Given the predominant EVC research focus on high school & college levels, and individual subjects, rather than overall achievement, we wanted to test how well do EVCs perform at younger age (specifically, we opted to focus on late elementary school age), and when predicting global measure of recent achievement, i.e., GPA. The latter aspect is particularly important, given that GPA is commonly perceived (and used) as the most important achievement metric at this educational level (when students' interests and specific strengths are not yet fleshed out). Therefore, we argue that it is important to assess how well do EVCs predict overall student achievement, when assessments are made globally, i.e., relating to school learning in general, and not to any individual school subject in particular, and when predicting overall school success.

It is unknown how useful would global EVC student assessments be. Namely, students can value individual school subjects very differently and find them vastly differently worth investing in. Those differences could simply cancel each other out, making global V and C assessments predictively useless. Conversely, students are arguably likely to be able to make reliable E assessments, as those are very strongly saturated by the previous achievements and tend to generalize (Talsma et al., 2018). However, previous achievements are also the best predictors of current & future achievement (Soares et al. 2015), thus the question here is – do global E / self-efficacy assessments actually add anything when predicting achievement – or could we simply use earlier achievement as a proxy metric for subsequent achievement, without even needing to E. These specific research questions we tried to address in this paper.

Method

Participants

Sample comprised 306 elementary school students from 8th and 9th grades (average age: M=13.90, SD=0.74 years).

Measures

The EVC dimensions were self-assessed by Jiang et al. (2018) scale, which was modified to refer to school and learning in general, instead of math only, as was the case in the original version. The scale has 24 7-point Likert items & three subscales:

1) Expectancy (6 items, e.g. *'I expect to do very well school.'*): ω=.88, M=4.55, SD=1.18.
2) Value (6 items, e.g. *'I think it is useful for me to learn in school.'*): ω=.88, M=4.36, SD=1.23.
3) Cost (12 items, e.g. *'To get good grades in school requires more effort than I want to put into it.'*): ω=.84, M=3.66, SD=1.16.

School achievement was represented by the GPA from both the previous school year (GPA_Y: M=3.94, SD=0.72), and just finished previous semester (GPA_S: M=3.71, SD=0.85). Prior to calculating correlations, the GPA measures were adjusted for gender, age, & SES. Being a newer / current achievement measure, GPA_S was used as a criterion.

Results

On a bivariate level (Table 1), the strongest correlate of the semestral GPA (GPA_S) is the previous year's GPA (GPA_Y). Among the EVCs, the strongest correlation with the GPA_S is obtained for E, followed by C, and V. When predicting semestral GPA (without GPA_Y in the model), the EVCs alone explained 25% of its variance, with the unique predictive values being: β_E=.50***, β_V=-.08, β_C=-.11*.

Prediction of the GPA_S with GPA_Y included in the equation is shown in Table 1. GPA_Y alone explains 61% of the semestral GPA variance. Adding EVCs above the GPA_Y significantly explains additional 3% of the GPA_S variance, with E and C, but not V being significant unique predictors.

Table 1: Prediction of the GPA_S.

	Predictors	β	*r*
I: R^2=.61	GPA_Y	.78***	
	GPA_Y	.71***	.78***
II: R^2=.64,	E	.14**	.48***
ΔR^2=.03, Δp<.001	V	-.01	.17**
	C	-.11**	-.20***

Notes: *** p<.01, ** p<.01, * p<.05.

Discussion

Can the EVC Model of motivation, applied to school learning in general, be used to effectively predict recent overall school achievement of late elementary school students? The answer is: yes. It can explain around 25% of the achievement's variance, with E being the biggest contributor (Jiang et al., 2018). Interestingly enough, V did not contribute significantly, while C did. This suggests that students even at late elementary school age are capable of making somewhat useful cost-to-benefit assessments about their level of investment in school learning, which in a modest way predicts their overall achievement. How valuable they view school learning in general, however, does not contain any predictive value. This is likely due to value information being lost when both highly and least valued subjects are diluted together. V assessments are likely too domain-specific (Gaspard et al., 2018) to be predictively useful when made globally, at least at this school age. Alternatively, elementary students might simply lack life experience and meta-cognitive skills to make nuanced V assessments.

Finally, both E and C predict (albeit slightly) current GPA over and above the previous GPA, showing that there are components of students' expectancy and cost beliefs that cannot simply be reduced to mere reflections of previous achievements and that they do matter, as they represent a 'subjective' component that can partially explain the differences between the current and prior achievement levels. They do so slightly, as prior achievement is still by far the best predictor of current achievement (Soares et al. 2015), but this is in line with the notion that students' performance could be enhanced by promoting aspects such as their sense of utility value and self-efficacy, regardless of previous success (Gaspard et al., 2018; Talsma et al., 2018).

Overall, the results support the notion that EVC model can be used as a valid achievement predictive framework on late elementary school level, even when assessments and predictions are done very generally, i.e., not related to specific school subjects.

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The Preliminary Validation of the Fogg Behavior Model (B=MAP) in Hypothetical Informal Educational Context

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Abstract

The Fogg Behavior Model, or a 'B=MAP' model, proposes that Behavior (B) is a function of three components: Motivation (M), Ability (A), and a situational 'trigger', i.e., Prompt (P). To conduct a preliminary test of the Model, we designed three hypothetical experimental scenarios, revolving around informal education. The sample comprised 246 university students. The results show that even after controlling for dispositional interests for the activities outlined in the scenarios, the Model explained generally large percentages of the intents to do the behaviors. Both M and A were significant unique B predictors. According to the Model expectations, P levels did not moderate the effects of M and A components. P's unique contributions above the Action line were modest, and we did not test if it cancels out other components' effects below the Action line, i.e., when its levels are insufficient to trigger an action. In conclusion, these findings offer preliminary support for the 'B=MAP' model, but further investigations are required, focusing on the Prompt's role, and ideally going beyond mere hypothetical situations.

Keywords: behavioral change, motivation, ability, prompt, informal education

Introduction

The Fogg Behavior Model, a.k.a. 'B=MAP' model (Fogg, 2019), proposes that three simultaneously converging components are required for a Behavior (B) to occur: 1) Motivation (M) – represents underlying physical, emotional, and social drives. 2) Ability (A) - describes how simple it is to perform a behavior considering the required time or mental energy, a necessity to break a usual routine, etc. 3) Prompt (P) – a type of 'trigger' that will set things in motion. This is conceptually shown in Figure 1. The three components interact, and you need all three of them for a behavior to occur, i.e., for it to land above the Action line.

M and A are continuous properties, as individual presumably has some levels of both for any given behavior (Fogg, 2019). M and A can cooperate and partially compensate each other. P can vary in terms of intensity, however, it functions on 'all or nothing' principle; if there is no P, the levels of M or A do not really matter (Fogg, 2019).

The B=MAP model traces its origins to the Stanford's Behavior Design Lab, but from the get-go it has been described using a 'plain language', and marketed as a tool for guiding everyday behavior change, i.e., aimed at 'tiny habits', or 'the small changes that change everything' (Fogg, 2019). As such, it has drawn considerable attention in the mainstream media and popular psychology circles, however, it has not yet received many formal academic considerations. Only a handful of academic papers have used it thus far as their theoretical framework, e.g., it has been utilized when studying environmental issues (He et al., 2020), reproductive health (Agha et al., 2019; Attarian et al., 2021), media disinformation (Muriel-Torrado & Pereira, 2020), etc.

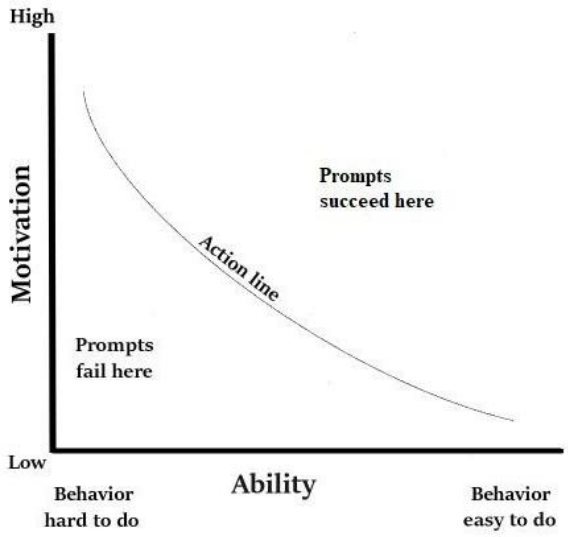

Figure 1: The Fogg Behavior Model (B=MAP) (adapted from Fogg, 2019).

We conducted a preliminary experimental validation study of the Fogg Behavior Model (Fogg, 2019), aiming to test how well it can predict behavior in several hypothetical situations. Keeping the spirit of the Model's intention, we opted to examine it in an informal education context, mainly revolving around informal educational context, i.e., extra-curricular activities, and life / soft skills acquisition (Lamberti et al., 2021; Seow & Pan, 2014).

Method

The research comprised 246 B&H (mainly Republic of Srpska) university students (71% women; age: M=22.63, SD=2.40 years). The participants filled out an anonymous online questionnaire containing three hypothetical scenarios:

- S1) writing a project for an NGO
- S2) mastering a new learning technique,
- S3) passing an 'everyday financial management skills' course.

Each scenario supposed a required behavioral investment & change, and had a cost-to-benefit consideration related to it. Scenarios were a repeated factor, i.e., each participant completed all three scenarios.

During the semester, you have continuously worked a part-time job and were not able to sufficiently devote yourself to your studies. The exam period starts in a few days. You can't stop with you part-time job during the exams. You need to pass two exams to be able to enroll next year, with the deadlines for both exams being at the very start of the exam term. **You received a recommendation** from a senior colleague to prepare for the exams with the help of the so-called **learning map technique,** in order to master the material more easily. Students' experiences show that the use of learning schemes significantly increases the average exam pass rate, but their creation requires an additional time investment.	← Stem of the S2 hypothetical scenario ← **P** (trigger) ← **Behavioral change** to be adopted ('Will a participant opt to learn, create & use the learning map technique?).
Your current work and activity routine leaves you with about **X hours** left for studying. Level 1: **X=25 hours** Level 2: **X=20 hours** Level 3: **X=15 hours**	← Additional context added to **P**, suggesting a possible necessity for a **Routine** change (progressive reduction in **A** for each Level variation).
The time it would take to create a learning map for both subjects you need to pass is a total of **X hours.** Level 1: **X=5 hours** Level 2: **X=7 hours** Level 3: **X=9 hours**	← Additional context added to **P**, specifying **Time** requirements (progressive reduction in **A** for each Level variation).
Level 1: **You received a learning map template & outline from a senior colleague. You will need to fill the templates out thought to produce your own specific learning maps.** Level 2: **You received a general recommendation from a senior colleague on how to design a learning map template. You will need to create your own templates and will them out to produce your own specific learning maps.** Level 3: **You didn't receive specific instructions from a senior colleague on hot to make a learning map. You will need to look up the templates, create them and fill them up to produce your own specific learning maps.**	← Additional context added to **P**, specifying **Mental effort** requirements of the task (progressive increase in mental effort, i.e., progresive reduction in **A** for each Level variation).

Box 1: Abbreviated conceptual outline of the hypothetical scenarios used in the experiment (S2 used as an example).

The B=MAP model assumes interaction between the components, but essentially a binary effect of P. To test P's assumed 'all-or-nothing' (v. dose-dependent response) effect, we varied 'the signal strength' of P, making the trigger less pronounced, compared to the presupposed A requirements. Specifically, we made three P variations / levels for each scenario, where the trigger requires progressively more A investment. However, in all three levels, we assumed that the Ps will be 'strong enough', i.e., that they all should fall above the Action line (as making Ps below it would require significantly different scenarios and experiment design). Abbreviated example based on S2 is shown in Box 1.

The scenario levels were unrepeated factor, with participants randomly assigned to L1 (N=84), L2 (N=80), or L3 (N=82). Participants were given all three scenarios in the matching Prompt conditions, i.e., all three were L1, or L2, or L3.

Each scenario was followed by the scenario-specific self-rated 5-point Likert questions about the participants' perceived M, A, and P, and the intent to conduct the Behavior outlined by the given scenario. The questions were made closely following the Model's assumptions (e.g., M questions included all of the so-called PAC subcomponents; Fogg, 2019). Given that P is mainly captured by the scenario levels, self-assessments about it were formulated to additionally measure how probable, desirable, & realistic participants perceived the situational trigger aspects of the scenarios to be (denoted as: P_P).

Prior to showing scenarios, we measured a self-assessed general dispositional interest (denoted as: D) for the contents of hypothetical scenarios (e.g., for S1: interest in writing NGO project proposals in general).

All self-assessments showed good internal consistencies (ωs from .78 to .92).

Results

First, we conducted moderation analyses (Ringle et al., 2022) to see if any of the effects differ as a function of the three P levels. As not a single effect was significantly different between the levels, the aggregated measures of all three scenario levels were used for the predictions.

Results of hierarchical regression analyses (JASP Team, 2023) predicting intentions to do the behaviors outlined in hypothetical scenarios are shown in Table 1.

In the step I we determined the baseline contributions of prior dispositional affinities for the Bs, while MAP components were added in the step II. The strongest prediction was obtained for S3 (54%), then S2 (44%), and finally S1 (28%), with M and A components being significant predictors in all scenarios, and perceived Prompt contributions being significant in S1 and S2.

Table 1: MAP components as predictors of B.

		S1		S2		S3	
		R_1^2=.446		R_1^2=.143		R_1^2=.184	
I		β	*p*	β	*p*	β	*p*
	(D)	.67	<.001	.38	<.001	.43	<.001
		R_2^2=.724, ΔR^2=.278		R_2^2=.581, ΔR^2=.439		R_2^2=.719, ΔR^2=.535	
		β	*p*	β	*p*	β	*p*
II	(D)	.22	<.001	.06	.165	.05	.173
	M	.26	<.001	.41	<.001	.43	<.001
	A	.37	<.001	.23	<.001	.38	<.001
	P_P	.13	.013	.16	.016	.09	.094

Notes: S1= writing a project for an NGO, S2=mastering a new learning technique, S3=passing an 'everyday financial management' skills course; D=prior dispositional affinity for the described activity. M=motivation, A=ability, P_P=perceived prompt.

Discussion

Currently, Fogg Behavior Model (Fogg, 2019) is still very new and mostly viewed as a 'popular psychology' framework, very sporadically used in academic research. However, our preliminary results suggest that B=MAP model (Fogg, 2019) predicts behavioral actions very well. Even after controlling for the initial dispositional affinities, MAP components in our three experiments explained between 28% and 53% of behavior intentions, with both M and A components having strong unique effects.

None of the correlations varied as a function of P levels, which is in line with the model's assumption that behavioral triggers follow 'all-or-nothing' principle, without influencing other components in a dose-dependent way (Fogg, 2019). Note that we didn't investigate what happens when P falls below the Action line threshold (where it is assumed that M and A would lose their impact on B; Fogg, 2019). These conditions could not be meaningfully implemented in our specific experimental scenarios, where all the triggers were set to be 'sufficiently strong'.

We also tried to indirectly investigate the relative P's contribution above the Action line, by measuring how the triggers are perceived by participants (e.g., how probable, desirable, & realistic they find them to be). Significant effects were observed in 2/3 scenarios, with lower effects compared to M & A.

In conclusion, while limited to a context of hypothetical informal educational scenarios, our preliminary findings show that the B=MAP model (Fogg, 2019) might, in fact, be a promising theoretical framework for studying and predicting behavioral changes, although the properties and the impact of Prompts require additional investigations, namely when trigger intensities are low.

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Art Experience in a Laboratory Context and in a 3D Navigable Gallery

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Abstract

Recent studies of art experience suggested that art-related contexts have a positive impact on aesthetic experience of artworks. In the present study, we compared the aesthetic experience of an art exhibition presented in two contexts that share the same display medium (computer screen), but differ in terms of the presence of art-related context: a 3D navigable gallery (VR viewing room) and a laboratory context. Thirty-six participants viewed the exhibition, which consisted of the same thirteen paintings presented in a 3D gallery and in a laboratory context. Participants were asked to rate each painting, as well as the entire exhibition experience in different contexts, in terms of the intensity of their aesthetic experience (via liking scale) and affective experience. The results showed that both the aesthetic and affective experience were more intense in the 3D gallery compared to laboratory context. The findings of this study confirmed that presenting art in art-related contexts such as VR viewing rooms contributes to the intensity of our aesthetic and affective experiences compared to the ordinary display of artworks on a computer screen in a laboratory context.

Keywords: aesthetic experience; affective experience; liking; VR; 3D gallery

Introduction

With advancements in technology, artworks have become more accessible to the general public. However, displaying art on a computer screen can result in the loss of key elements of the artwork (e.g., size, texture, three-dimensionality) as well as the loss of many other elements of galleries and museums that could contribute to the overall experience of consuming art (e.g., frames, walls, their specific colour, lighting type etc.). We call these elements "art-related context". Recently, virtual reality has emerged as a way to preserve both the art-related context and the characteristics of the work, but this technology is still not widely available. As a result of the COVID-19 pandemic and the subsequent closure of galleries and museums, a fourth way of viewing art has become popular - 3D navigable online galleries, which retain both the art-related context and the characteristics of the work (Jenkins, 2021; Markopoulos et al., 2021).

Previous findings indicated that art displayed on a computer screen is liked less, and is perceived as being less interesting, less arousing, less positive (Brieber et al., 2015) and less pleasant when compared to art displayed in a real-world gallery or museum (Locher et al., 1999; Locher et al., 2001). Participants also tend to spend less time looking at works of art when they are presented on a computer as opposed to in a museum (Brieber et al., 2014). Previous research comparing the aesthetic and affective experience of artworks in laboratory and VR settings suggests that the aesthetic experience of paintings is less intense, paintings are perceived as being less impressive, and participants are less motivated to know more about the paintings when they are presented on a computer screen compared to VR gallery (Janković et al., 2019).

Our research aims to contribute to the existing literature on the experience of art in different contexts by comparing the aesthetic and affective experience of paintings presented in two different settings that share the computer screen as a display medium – the classic laboratory setting and the 3D navigable online gallery (VR viewing room).

Method

Participants

Thirty-six participants (63.9% females) took part in the study. The participants (M_{age} = 23.06, SD = 1.19) were university students recruited online using snowball sampling. All participants had normal or corrected to normal vision and their participation in the study was voluntary.

Stimuli

The stimuli used in this study consisted of thirteen high-resolution digital images of contemporary paintings. All of the artworks used in the study were part of the exhibition "Passion and Restraint" curated by Virginia Alberdi. This exhibition was chosen because the paintings in it varied in artistic style and subject matter, ranging from those featuring subdued colour palettes and more neutral themes to very striking paintings with vivid colours and provocative content.

Instrument

An 8-item questionnaire consisting of unipolar 10-point scales was used to measure participants' aesthetic experience (operationalized as liking) and affective experience (operationalized through pleasantness (valence), impressiveness and interestingness (arousal), and comprehensibility and desire to know more (cognitive evaluation). Participants were also asked via open-ended

questions to describe their experience viewing the exhibition in the two settings.

Procedure

Stimuli were presented in two parallel settings: the lab setting (in which artworks were presented on a white background on the computer screen) and the 3D navigable gallery setting (VR gallery accessed by participants on computer screen, i.e., through website). Half of the participants visited the exhibition in the laboratory setting first and subsequently in the 3D gallery, the other half viewed the exhibition in the opposite order of contexts. In each of the two contexts participants were asked to rate their aesthetic and affective experience of the individual paintings as well as their experience of the entire exhibition. After viewing the exhibition in both contexts, researchers conducted a semi-structured interview with each participant individually. Questions in the interview were focused on the experience of the exhibition in the two settings.

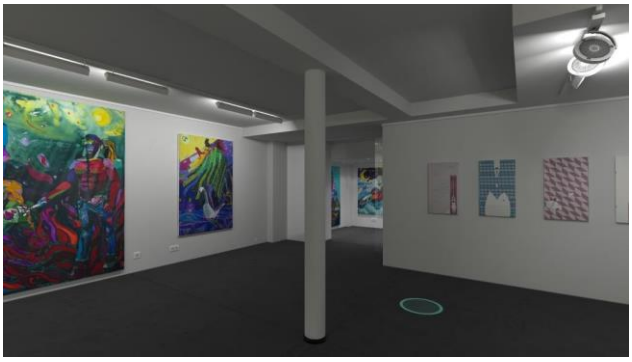

Figure 1: 3D gallery setting from the participant's perspective.

Results

Nonparametric tests were used due to the non-normal distribution of the data. To compare the two settings the Wilcoxon signed-rank test was used. The results showed significant differences in the ratings of the experience of the exhibition in the 3D gallery and the lab context (Figure 2). Both the aesthetic (Z = -3.49, p<.01, r = -.58) and affective experience: impressiveness (Z = -2.41, p<.05, r = -.40), pleasantness (Z = -2.44, p<.05, r = -.41), interestingness (Z = -2.86, p<.01, r = -.48), beauty (Z = -2.10, p<.05, r = -.35), and the desire to know more about the exhibition (Z = -2.15, p<.05, r = -.36) were more intense in the 3D gallery. Participants also had a greater desire to purchase artworks from the 3D exhibition (Z = -3.13, p<.01, r = -.52). Statistically significant differences were obtained on all variables except for comprehensibility (Z = -.19, p = .85, r = -.03).

No statistically significant differences were found in the evaluation of individual artworks in the two contexts.

The results of the qualitative analysis were in line with the findings of the quantitative analysis. The qualitative analysis showed that participants found the 3D gallery to be more interesting, realistic, powerful and novel and that they attributed greater artistic and material value to the images displayed in this context. Participants even directly referenced the positive impact various elements of art-related context had on their overall experience. However, the 3D gallery was also more difficult for some to navigate due to its novelty.

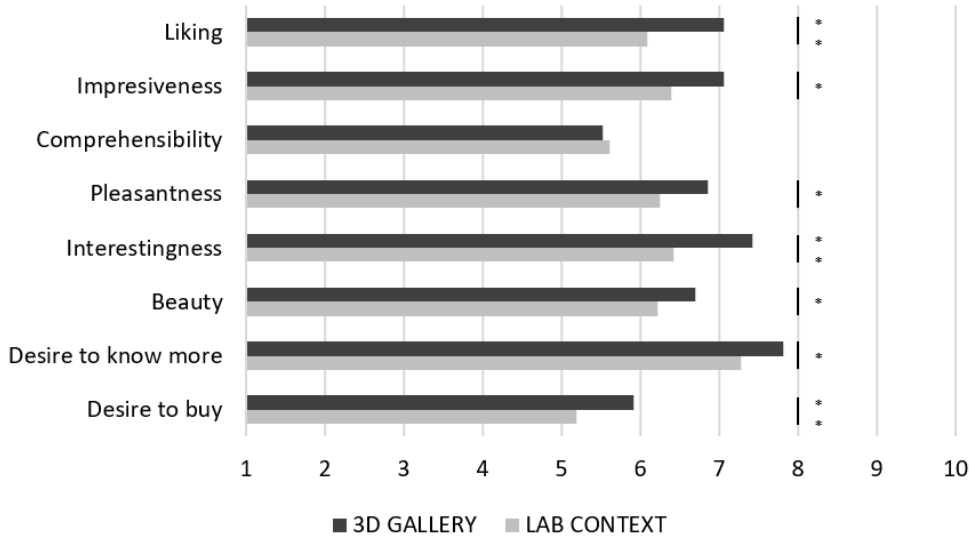

Figure 2: Differences in the affective and aesthetic experience of the art exhibition presented in the laboratory context and the 3D navigable online gallery

Discussion and Conclusions

The findings of this study indicate that the use of a 3D navigable gallery results in a more intense overall aesthetic and affective experience when compared to a traditional lab setting. However, no significant differences were observed in individual image ratings between the contexts.

One possible explanation for these somewhat conflicting results is the differential influence of the medium and the art-related context, since both contexts share the same display medium (computer screen), but differ in terms of the presence of art-related context.

It is possible that respondents placed more importance on the art-related context (i.e., factors such as the appearance of the gallery, the ability to move around, the presence of frames and lighting) as opposed to the experience of individual paintings when thinking about their overall experience of the exhibition. On the other hand, when evaluating individual artworks, the respondents mainly viewed the images in the similar conditions in both contexts - cantered and enlarged on the computer screen - which left the art-related context hidden from view.

Finally, we must emphasize that the results of this study do not provide us with an unequivocal conclusion whether the aesthetic and affective experience of artworks is enhanced due to the presence of art-related context in the 3d gallery or reduced due to the absence of art-related context in the laboratory context. In order to adequately answer this question, it is necessary to conduct additional studies in which the experience of art in the mentioned contexts would be compared with the experience of art in real-world contexts such as real galleries and museums.

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Factor Structure of the Meaning Attributed to Dance: The Perspective of Non-Dancers

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Abstract

This paper explores the factor structure of the meaning attributed to dance by observers without dance expertise. The study involved students from Novi Sad School of Business who assessed 13 indicators of meaning on a five-point Likert scale. After the exploratory factor analysis (EFA) based on a principal axis factoring (PAF) procedure with Varimax rotation for 13 indicators was applied, three extracted factors were kept as they gave the most interpretable solution. These three factors have a common explained variance of 51.15% and they are: *Creative Self-expression* (A way of returning to myself, Creativity, An ideal way of expressing myself, Stress relief), *Body attractiveness* (A way of seduction, A way of expressing my sexuality) and *Effort* (An effort and A frustration). The meaning attributed to dance by those who do not have dance expertise is very similar compared to those who do. This result is discussed in the context of the universality of dance. It is concluded that dance in which physical, psychological and spiritual components are intertwined into a unique whole is a very specific phenomenon whose universality and importance enable its perseverance in different cultures throughout almost the entire human history.

Keywords: non-dancers; attribution of meaning to dance; creative self- expression; body attractiveness; effort

Introduction

Dance is a universal human activity that has traversed through all epochs and social orders. The multi-functionality of dance reflects in the fact that it contains communicative and integrative, aesthetic, educational, social and "healing" functions (Džadžević, 2005; Maletić, 1986; Vukadinović, 2019). Unlike dance as a form of art, spontaneous dance, as one of the basic forms of human expression, is often used as a tool in different areas of human life (Vukadinović, 2019).

Having in mind the complexity of dance, as well as the fact that it is as old as the people's ability to walk or run (Bramble & Lieberman 2004), it can be assumed that people attribute certain meanings to dance. What dance means to a person depends on his or her expertise and level of professionalism (Lovatt, 2018; Orgs, Calvo-Merino, & Cross, 2018; Rose, Müllensiefen, Lovatt, & Orgs, 2020). Moreover, the meaning attributed to dance is influenced by one's motivation to dance (Maraz, Király, Urbán, Griffths, & Demetrovics, 2015). The culture a person belongs to could be a significant factor in his or her attribution of meaning to dance.

Due to all of this, and especially bearing in mind the structure of our sample of non-dancers who practice spontaneous dance at social occasions, it can be hypothesized that entertainment and creativity, as well as self-expression will single out in the factor structure of the meaning attributed to dance by non-dancers.

Method

This paper aims at exploring the meaning non-dancers attribute to dance.

Participants and procedure

In the study participated 180 students aged between 17 and 24 years (M = 19.31, SD = 1.14, 72.2 % woman) from Novi Sad School of Business. The participants were non-dancers, i.e. they did not have any kind of recreational or professional dance training. However, all of them practice spontaneous dance on occasions such as parties and celebrations.

After the participants gave their informed consent to participate in the study this, their task was to assess the 13 items which represented the indicators of meaning. Students took part in the study voluntarily and their participation was anonymous. The study was conducted in accordance with the Declaration of Helsinki.

Instrument

The instrument was made for the purpose of the author's larger study and it was previously used in research related to dancers' personality traits (c.f. Vukadinović, 2022). It consisted of 13 items, given in the form of sentences: "Dance for me is: 1 – A pleasure; 2 – An escape from reality; 3 – An effort; 4 – An enjoyment; 5 – A frustration; 6 – A way of returning to myself; 7 – An ideal way of expressing myself; 8 – Creativity; 9 – Stress relief; 10 – A way of being in good physical shape; 11 – A way of expressing my sexuality; 12 – A way of seduction; 13 – A form of entertainment". The participants made their assessments on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree).

Results

In performing (EFA), the Principal Axis factoring (PAF) was used to extract the factors from the data matrix. Bartlett's test of sphericity was significant, χ^2 (78) = 991.983, p < .001.The Kaiser-Mayer-Olkin measure of sampling adequacy indicated that the strength of the relationship among variables was high (KMO = .86). Three

factors with eigenvalues greater than 1 were extracted. In order to decide how many factors would be kept, a parallel analysis using syntax was performed. As a result only three factors have mean (Random data eigenvalues obtained in parallel syntax) which is lower than Initial Eigenvalues obtained in SPSS (see Table 1). These analyses showed that the three factors gave the most interpretable solution.

Table 1: Parallel analysis with SPSS and Syntax

	Initial Eigen values			Extraction Sums of Squared Loadings			Random data eigenvalues
	Eigenvalue	% Variance	% Cumulative variance	Eigenvalue	% Variance	% Cumulative variance	Means
Factor 1	5.296	40.738	40.738	4.868	37.448	37.448	1.471
Factor 2	1.540	11.846	52.581	0.959	7.379	44.827	1.351
Factor 3	1.238	9.523	62.104	0.823	6.327	51.154	1.235

Note: The results from Parallel analysis using syntax are shown in the last column

Altogether, the three factors can explain for 51.15% of all the variances. Moreover, a Varimax rotation was performed. The obtained loading indexes of the most loaded scales (the highest factor loadings on each factor) are displayed in Table 2.

In relation to the content of the obtained factors they are named as follows: *Creative Self-expression* (Factor 1), *Body Attractiveness* (Factor 2) and *Effort* (Factor 3).

The results of the exploratory factor analysis, principal axis factoring with Varimax rotation, have shown that the structure of what dance means for non-dancers consists of three dimensions: *Creative Self-expression* (A way of returning to inner self, Creativity, A way of expressing myself, and Stress relief), *Body Attractiveness* (A way of expressing my sexuality, A way of seduction), and *Effort* (Frustration and Effort).

Table 2: The three factors extracted and presented with factor loadings based on the Principal Axis Factoring with Varimax rotation for 13 indicators of the meaning of dance for non-dancers.

	F1 Creative Self-expression	F2 Body attractiveness	F3 Effort
Indicators of the meaning attributed to dance by non-dancers:			
1 A way of returning to myself	**.788**		
2 Creativity	**.778**		
3 An ideal way of expressing myself	**.778**		
4 Stress Relief	**.744**		
5 An escape from reality	.742		
6 An enjoyment	.675		
7 A pleasure	.663		
8 A way of being in good physical shape	.450		
9 A form of entertainment	.427		
10 A way of expressing my sexuality		**.771**	
11 A way of seduction		**.704**	
12 An effort			**.452**
13 A frustration			**.649**

Note: Only the descriptors with factor loadings of .40 and above are shown

For each factor, only the first few items with the highest loadings were kept. The descriptive statistic for each factor (M, SD, MIC and Chronbach's alpha) after the item selection is shown in Table 3.

Table 3: Descriptive statistics for factors related to the meaning attributed to dance

Meaning attributed to dance Factors	*M*	*SD*	*MIC*	*α*
1 Creative Self-expression (4 items)	13.19	4.39	.622	.868
2 Body attractiveness (2 items)	5.01	2.25	.563	.719
3 Effort (2 items)	3.60	1.597	.318	.478

Note: M - Arithmetic mean calculated for total scores on each factor; MIC – Mean inter-item correlation, α – Chronbach's alpha

Furthermore, the correlations between the factors after the item selection were calculated. Only the correlation between Self-expression and Body attractiveness is significant and medium strong (r= .550, p < .001).

Discussion and Conclusion

Results of this study have shown that the participants' structure of meaning attributed to dance consists of three dimensions: *Creative Self-Expression, Body Attractiveness*, and *Effort.*

Regarding *Creative Self-Expression* the results have shown that dance is a kind of a tool for creative self-

expression for non-dancers. This finding is in line with earlier studies which have shown that spontaneous dance has the function of communicating inner states, moods and feelings (Džadžević, 2005; Maletić, 1996; Vukadinović, 2019).

Body Attractiveness is connected to a kind of eroticism which is not attributed only by our participants but it is inherent to the nature of dance itself (Hanna, 2010). The results are also in line with earlier studies which indicated that sexual motif is one of the main motivators of human dance in general (Džadžević, 2005; Havelock, 1983; Maletić, 1986, Martin, 1965; Spencer 1988).

Even though it was expected that our participants would attribute only positive meaning to dance (joy, pleasure, entertainment), the results have shown that dancing could bring frustration and represent an effort for some. It is because dance is a kind of an intimate act, i.e. body movement may reveal what the person had not intended to tell (Vukadinović, 2019). Dancing in front of other people, along with the physical contact with a partner, could contribute to the experience of frustration which sometimes follows dancing.

It can be concluded that our results show that for our participants dance has the meaning of creative self-expression, body attractiveness and effort. When the meaning of dance for non-dancers is compared to the meaning of dance for dancers (Vukadinović, 2022), the dimensions obtained are very similar. These similarities between dancers and non-dancers in the attribution of the meaning to dance point towards one of the main and most important characteristics of dance and that is its universality. Therefore, it can be concluded that dance in which physical, psychological and spiritual components are intertwined into a unique whole is a very specific phenomenon whose universality and importance enable its perseverance in different cultures throughout almost the entire human history.

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The Differences in the Attribution of Meaning to Dance between Dancers and Non-Dancers

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Abstract

This paper explores the differences in the attribution of meaning to dance between dancers and non-dancers. Two groups formed on the basis of their dance expertise participated in the study. One group consisted of 98 dancers (professional and recreational) and the other group of 180 students from Novi Sad School of Business. Both groups assessed 13 items representing the indicators of meaning which can be attributed to dance. The indicators were given in the form of sentences and assessed on five-point Likert scale. The results of independent t-test have shown that dancers attribute ten indicators of meaning to dance more strongly compared to non-dancers. These are Pleasure, Enjoyment, An escape from reality, A way of returning to myself, An ideal way of expressing myself, Creativity, Stress relief, A way of being in physical good shape, A way of seduction and A way of expressing my sexuality. The results have also shown that the people who do not have experience in dance attribute Effort as an indicator of the meaning of dance more strongly compared to dancers. Based on these results, it is concluded that experience in dance positively influences the attribution of meaning to dance.

Keywords: experience in dance; dancers; non-dancers; attribution of meaning to dance.

Introduction

The main goal of this paper is to compare the differences in the meaning attributed to dance by dancers and by those who do not have any expertise in dance practice. As a starting point for the present research, we have compared the results obtained in our previous studies dealing with the factor structure of the meaning attributed to dance by two different groups of participants: dancers (Vukadinović, 2022, 2023b) and non-dancers (Vukadinović, 2023a).

As it was shown by different authors, expertise in dance significantly influences the aesthetic judgement, appreciation and experience of dance (Orgs, Calvo-Merino, & Cross, 2018; Rose, Müllensiefen, Lovatt, & Orgs, 2020; Vukadinović & Marković, 2012; Zardi, Carlotti, Pontremoli, & Morese, 2021). Compared to those who dance spontaneously at different social occasions (Lovatt, 2018), people with training in dance have specific visual and motor familiarity of the movement which influences their perception of dance (Bläsing, 2015; Christensen, Gomila, Gaigg, Sivarajah, & Calvo-Merino, 2016).

Having all this in mind, we assumed that expertise in dance would influence the understanding of dance as well as the meaning attributed. As a first step, we conducted different research to find out what the structure of the meaning attributed to dance would be, while separately investigating attribution of the meaning by dancers and non-dancers (Vukadinović, 2022, 2023a, 2023b). It became apparent that the structure is very similar. Please see Table 1.

Table 1: Comparison in the factor structure of the meaning attributed to dance by non-dancers and dancers

COMPARISON IN THE FACTOR STRUCTURE OF THE MEANING ATTRIBUTED TO DANCE	
Non-dancers*	Dancers**
Creative Self-Expression	*Self-Expression*
A way of returning to inner self	A way of expressing myself
Creativity	A way of returning to inner self
A way of expressing myself	A stress relief
Stress relief	
Body Attractiveness	*Body Attractiveness*
	A way of being physical good shape
A way of expressing my sexuality	A way of expressing my sexuality
A way of seduction	A way of seduction
Effort	*Effort*
A frustration	A frustration
An effort	An effort

Note: * Study by author (Vukadinović, 2023a);
** Study by author (Vukadinović, 2022, 2023b)

These similarities in the structure are explained in the light of the uniqueness of the phenomenon of dance which is especially characterized by its universality. The meaning attributed to dance is not essentially different for those who practice it spontaneously on social occasions and for those who have training and expertise. The idea or the "construct" of what dance means to people is similar.

However, taking into account the above-mentioned studies on the influence of dance expertise, it can be assumed that even though the structure of attributed meaning to dance is similar between non-dancers and dancers, the intensity of a particular indicator of the meaning attributed will be different. For example, it can be hypothesized that dancers will attribute more pleasure or enjoyment to dance compared to non-dancers. For those with expertise, dance will represent a better way of expressing themselves or their creativity than for non-dancers.

Method

This paper aims at exploring the differences between dancers and non-dancers in the intensity of the meaning attributed to dance.

Participants and procedure

There were two samples of participants which were used in previous studies – dancers (Vukadinović, 2022, 2023b) and non-dancers (Vukadinović, 2023a). These two groups were separated based on their dance expertise. The group of non-dancers, consisted of 180 students aged between 17 and 24 years (*M*=19.31, *SD*= 1.14, 72.2 % female) from Novi Sad School of Business (Vukadinović, 2023a). The second group included 98 dancers aged between 17 and 57 years (*M* = 34.71, *SD* = 11.21; 86.7% female) (Vukadinović, 2022).

The procedure was the same for all participants. After they have given their informed consent to participate in the study, their task was to assess 13 items which were given in the form of sentences. All participants took part in this research voluntarily and anonymously. The study was conducted in accordance with the Declaration of Helsinki.

Instrument

The instrument was constructed on the basis of a wide range of literature related to the meaning of dance (c.f. Vukadinović, 2022). It was previously used in research related to dancers' personality traits (c.f. Vukadinović, 2022), as well as in a study related to the non-dancers' attribution of meaning (Vukadinović, 2023a).

The instrument consisted of 13 items, given in the form of sentences: "Dance for me is: 1 – A pleasure; 2 – An escape from reality; 3 – An effort; 4 – Enjoyment; 5 – A frustration; 6 – A way of returning to myself; 7 – An ideal way of expressing myself; 8 – Creativity; 9 – Stress relief; 10 – A way of being in good physical shape; 11 – A way of expressing my sexuality; 12 – A way of seduction; 13 – A form of entertainment". The participants made their assessments on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree).

Results

The results of *independent t-test* have shown that dancers attribute ten indicators of meaning to dance more strongly compared to non-dancers, please see Table 2.

Table 2: The comparison of the meaning attributed to dance between non-dancers and dancers

Meaning Attributed to dance	Non Dancers		Dancers		t-value
	M	*SD*	*M*	*SD*	*t(276)*
Pleasure	3.88	1.11	4.82	0.49	-7.981**
An enjoyment	3.51	1.26	4.81	0.50	-9.784**
An escape from reality	2.85	1.33	3.27	1.26	-2.431**
A way of returning to myself	2.90	1.33	4.31	1.09	-8.983**
An ideal way of expressing myself	2.70	1.35	4.39	1.00	-10.886**
Creativity	3.78	1.26	4.52	0.08	-5.171**
Stress relief	3.80	1.22	4.67	.87	-6.229**
A way of being in good physical shape	3.27	1.28	4.19	1.14	-5.917**
A way of seduction	2.87	1.31	3.32	1.15	-2.828*
A way of expressing my sexuality	2.13	1.23	3.65	1.16	-9.993**
Effort	2.20	1.05	1.74	.93	2.183*
A Frustration	1.48	0.78	1.58	0.91	0.854
A form of Entertainment	4.53	0.78	4.70	0.66	-1.826

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

The differences between dancers and non-dancers regarding the two indicators of the meaning attributed to dance: "A form of entertainment" and "A frustration" are not statistically significant.

Discussion and Conclusion

The results have shown that dancers assess the indicators of meaning attributed to dance with higher values compared to non-dancers. People who have experience in dance attribute different meanings to dance more strongly than those who are dancing spontaneously.

Regarding the psychological tendencies expressed through dance, dancers attribute creativity and self-expression to the meaning of dance more strongly than non-dancers. Previous research showed that these psychological tendencies expressed through dance represent the benefits of spontaneous dance, but also that they form the basic and essential drivers of dance as a form of art (Barreiro & Furnham, 2019; Blom & Chaplin, 2000; Cova & Deonna 2014; Fink & Woschnjak 2011; Vukadinović, 2016).

When it comes to the physical tendencies expressed or achieved through dance, people with dance expertise attribute seduction and sexuality to the meaning of dance more strongly than non-dancers. It is especially those who have training in dance in pairs that tend to attribute more eroticism to the meaning of dance compared to those without such expertise (c.f. Vukadinović, 2022). Unlike non-dancers, dancers probably relate their good physical

shape with their dance abilities, mastery of movement as well as better body representation and higher proprioceptive integration (Jola, Davis, & Haggard, 2011; Montero, 2006, 2012, 2016; Proske, 2006; Vukadinović, 2019) which are all default requirements of dance technique (McFee, 1992), no matter the form of dance.

Mutual connection of the psychological and the physical components that enables a unique experience of dancing, lead to the dancer's pleasure and enjoyment in dance (Brown, Martinez, & Parsons, 2006; Jowitt, 1994; Krešić, 1997; Vukadinović, 2019). Moreover, on the neurobiological level, the rhythmicity of dance in general brings pleasure (Foster Vander Elst, Vuust, & Kringelbach, 2021; Janata, Tomic, & Haberman, 2012; Witek, Clarke, Wallentin, Kringelbach, & Vuust, 2015).

Finally, the result which indicates that non-dancers attribute Effort more strongly to the meaning of dance compared to dancers, probably points towards the significance of dance expertise.

Nevertheless, it can be concluded that our results indicate that experience in dance positively influences the attribution of meaning to dance, i.e. expertise influences the intensity of how particular indicator is assessed. The similarities in the structure and the differences in the intensity of the attribution of meaning to dance by those with and without expertise highlight the significance of dance as a universal human behavior which has lasted and surely will continue to develop through time.

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