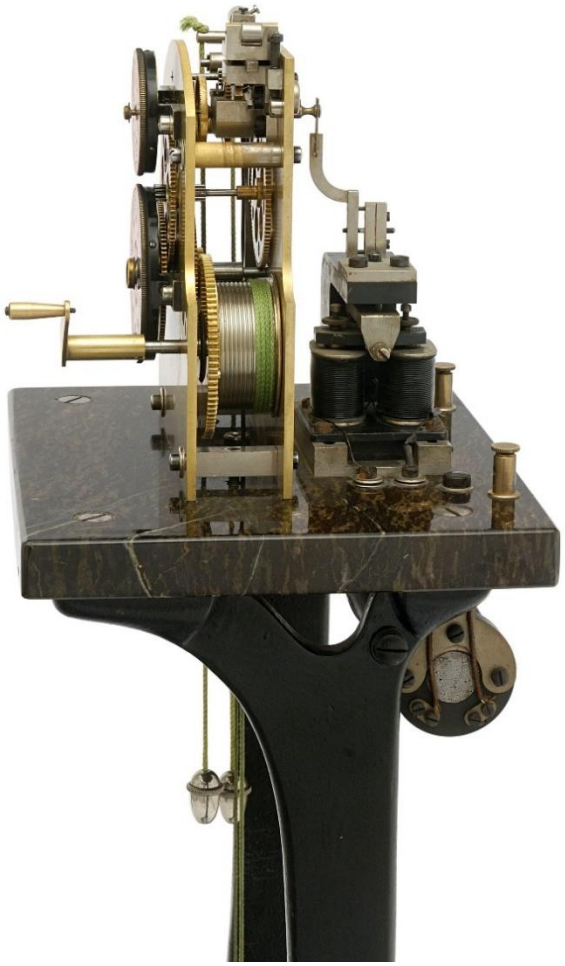
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EMPIRICAL STUDIES IN PSYCHOLOGY

MARCH 28 – 30, 2025
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INSTITUTE OF PSYCHOLOGY
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Original Scientific Paper
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The Influence of Mental Representation Network Configuration on the Aesthetic Evaluation of Avant-garde Compositions

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Abstract

Previous research has suggested a network-based model as the foundation of the emerging aesthetic experience of music listening. This study aimed to explore how the complexity of the mental representation network, familiarity with music, level of musical training, and gender influence aesthetic response to avant-garde music. Forty-one first-year psychology students assessed their aesthetic experience across three experimental conditions: audio-only, video, and video accompanied by a theoretical explanation. A semantic differential scale measuring valence, arousal, and cognitive evaluation was used. Results suggest that the level of musical training and gender shape how listeners process aesthetic experience. Participants with primary musical education relied more on theoretical explanations, while non-trained participants relied more on visual cues. Findings support the hypothesis that network complexity enhances aesthetic evaluations when the information is coded visually, aurally, and semantically, suggesting that musical training, further modified by gender, is a notable factor in shaping the aesthetic experience of the selected avant-garde pieces.

Keywords: aesthetic judgment; mental representation network; avant-garde music; familiarity

Introduction

A recent approach to aesthetic preference in music, founded on the Reciprocal-Feedback Model of musical response, proposes a network substrate composed of nodes — cognitive units — configured into a mental representation network representing the listening experience of a composition (Hargreaves, 2012; Schubert et al., 2014). The Reciprocal-Feedback Model identifies three key determinants of the response to music: musical features (e.g., genre, complexity, familiarity), the listening context, and the listener. The dynamic architecture of node assemblies operates through a spreading activation mechanism, with excitation as its core principle. Nodes are interconnected via links, with connection strength governed by semantic relatedness and further reinforced through repeated external stimulation (Schubert, 2021, 2023). It is argued that net activation of the network is linked to the experienced hedonic tone (Martindale, 1984).

A battery of evidence has substantiated that visual information contributes to the perception of musical expression, musical features (phrasing, dynamics, rubato), and emotional depth (e.g., Czeipel et al., 2023; Juchniewicz, 2008). This multisensory integration fosters an embodied experience through the activation of shared affective-motor networks and influences electrodermal activity, facilitating and enhancing aesthetic experience (Chapados & Leventin, 2008; Czeipel et al., 2023; Freedberg & Gallese, 2007).

Next to that, previous research has proposed that aesthetic response stems from affective evaluations of meanings, with 96% of the variance in aesthetic preference accounted for by three dimensions – valence, arousal, and cognitive evaluation – making them strong candidates for explaining aesthetic experience (Janković & Mađarev, 2024).

This research aims to explore the relationship of gender, musical training, mental representation network complexity and familiarity – identified as a determinant of aesthetic preference (e.g., Madison & Schiölde, 2017; Schubert, 2021) – on aesthetic evaluations of avant-garde pieces. We hypothesize that greater interconnectedness of the network, measured by the number of nodes assembled, results in more positive aesthetic assessments. We further hypothesize that individuals with higher levels of musical training will assign higher aesthetic ratings due to their more complex mental representational networks. Musical training facilitates network development through the acquisition of technical and theoretical knowledge, as well as through greater exposure to classical and avant-garde music. Lastly, we hypothesize that familiarity with music yields more positive assessments, as repeated exposure strengthens the links between nodes, in line with the Preference Feedback Model's assumption of a positive monotonic relationship between familiarity and preference (North & Hargreaves, 1995).

Method

Participants

A convenience sample of 41 first-year psychology students (80.5% female) from the University of Belgrade was used, after informed consent was obtained. Participants were categorized by the level of musical training (no musical training, primary and secondary musical education) and familiarity with avant-garde music (19.5% had prior experience). A total of 12 participants

were musically trained: 29.3% had completed primary music school, and 4.9% had completed secondary music school.

Stimuli

Three contemporary pieces were presented: *Metamorphosis II* by Philip Glass, *Klavierstück X* by Karlheinz Stockhausen and *Atlas Eclipticalis* by John Cage. The compositions were trimmed to one-minute excerpts.

Measurements

The assessments were obtained via modified CD-15, version 3.0 (Janković, 2001), a five-point connotative differential scale measuring valence, arousal, and cognitive evaluation.

Procedure

Participants were randomly assigned to groups based on the last digits of their student ID numbers. Participants were instructed to assess their aesthetic experience across three experimental conditions: listening to audio only (Task 1), watching a video (and audio) performance (Task 2), and reading a theoretical explanation accompanying the video (Task 3). Stimuli were counterbalanced across the three conditions to avoid order and modality-related confounds. Data was collected via three Microsoft Forms questionnaires. The data were analyzed using the SPSS package for Windows.

Results

The mean aesthetic evaluation score was calculated for each participant across all three listening tasks based on the sum of the semantic differential scale values. Repeated measures ANOVA was conducted to test the differences between the three listening tasks. The analysis yielded statistically significant differences across the three levels of the experimental factor ($F(2,80) = 4.224$, $p < .05$), corroborating the hypothesized influence of network complexity on the aesthetic experience (Figure 1). Subsequently, pairwise comparisons were performed across the three listening tasks. A statistically significant difference was found between Task 2 and Task 3 ($t(39) = 2.871$, $p < .05$). Furthermore, the interaction between the musical training level and network complexity ($F(4,80) = 2.634$, $p < .05$, Figure 2) and the three-way interaction between complexity, gender and musical training level ($F(4,80) = 3.190$, $p < .05$) were registered. To investigate the interaction between network complexity and musical training further, estimated marginal means (EMMs) were computed. The analysis revealed statistically significant differences in aesthetic evaluation between participants without musical training and those with primary-level music education, specifically when Task 2 ($t(37) = 2.295$, $p < .05$) and Task 3 ($t(37) = 1.972$, $p < .10$) were performed.

Discussion and Conclusion

This study investigated the relationships between mental representation network complexity, musical training, gender, familiarity with music, and the aesthetic evaluation of avant-garde music. The findings support the hypothesis that greater network complexity leads to more positive aesthetic evaluations, with the highest scores occurring when the piece was coded aurally, visually, and semantically. However, adding visually coded nodes did not enhance aesthetic ratings, contrary to findings suggesting that viewing a performance boosts the aesthetic experience (Czeipel et al., 2023; Freedberg & Gallese, 2007). The interactive nature of musical training, gender, and network complexity influenced the results.

A previous study proposed that the affective experience of watching a music performance is independent of musical expertise (Broughton et al., 2021). Conversely, our results indicate that non-trained subjects rely more on visual cues in aesthetic processing, whereas subjects with primary music school gave higher scores when provided with theoretical explanations. We assume that trained participants have differently structured networks due to greater theoretical knowledge, allowing the accompanying explanation to activate and modify corresponding nodes, thereby heightening the aesthetic experience.

A key limitation of the study was the small sample size, which may have influenced the findings. Furthermore, no differences in aesthetic response were observed based on familiarity, despite familiarity being a robust finding in previous research (e.g., Schubert, 2021). This discrepancy is likely due to the limited number of participants familiar with avant-garde music.

Future studies should be conducted with a larger sample and in more naturalistic settings to further elucidate the role of visually coded nodes in shaping the aesthetic experience.

In conclusion, the findings suggest that greater network complexity leads to more positive aesthetic evaluations, which are affected by the level of musical training. Results imply that the aesthetic experience may differ when avant-garde music is involved, and this requires further investigation.

Figure 1: The relationship between network complexity and aesthetic evaluation.

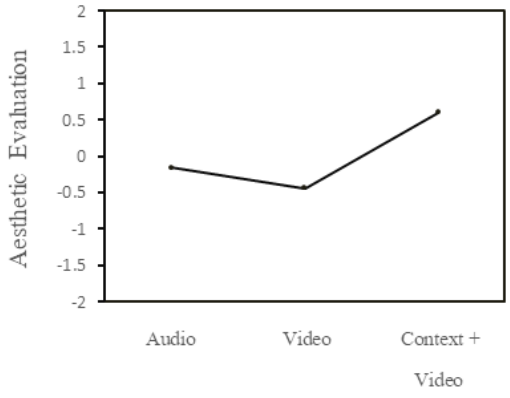
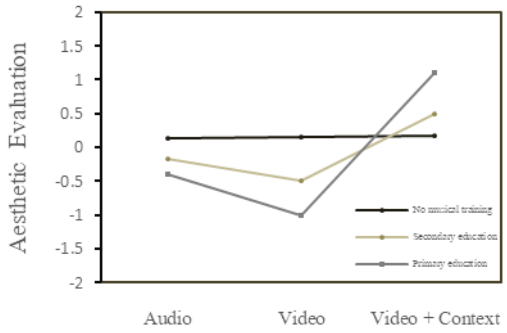


Figure 2: The interaction between musical training and network complexity.



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The Effects of Objects Dimensionality and Mode of Presentation on Lightness of Multi Lit Objects

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Abstract

Even though our visual reality is mostly composed with three-dimensional (3D) multi-lit objects, lightness studies were traditionally conducted on two-dimensional (2D) uniformly illuminated stimuli. In addition, we are increasingly more often met with virtual stimuli presented on various screens. Previous studies did not test the influence of Object dimensionality (OD; 2D and 3D) and Mode of Presentation (MoP; real and virtual) on lightness perception. The goal of this study was to test the influence of these factors on lightness of multi-lit objects. We examined the effect of MoP by presenting paper-made objects in E1 and rendered objects in E2. In both experiments, the scene contained shadow that split the presented stimuli into two differently illuminated parts. Half of the participants in each experiment produced Munsell matches for the whole object and another half only for differently illuminated parts (Task type). Results show that 3D and virtual objects appear darker than 2D and real objects. Results also show that Task type modulates these effects. In addition, we replicated previous finding that lightness of the whole object depends on lightness of the part that is in higher illumination, and we extend that conclusion for both virtual and 3D objects.

Keywords: lightness; object dimensionality; mode of presentation; objects under different illumination levels

Introduction

Lightness refers to perceived intensity of achromatic surfaces, and it is strongly influenced by object reflectance. Traditional studies have shown that lightness is influenced by the intensity and size of illumination and by the reflectance range and number of the neighbouring surfaces. Lightness is also influenced by our ability to correctly detect different levels of illumination and spatial relationships among objects. These studies have mostly been using simple two-dimensional (2D) paper stimuli under homogeneous illumination. In everyday conditions we are met with three-dimensional (3D) objects that are under different illumination levels. In addition, we are more frequently met with virtual objects that are presented on various displays. That is why more recent studies of lightness perception focus on the additional factors that could influence lightness perception.

Robilotto & Zaidi (2004, 2006) suggest that 3D objects should lead to more veridical perception compared to 2D objects. They assume so because the differences in object geometry produce photometric differences (e.g. luminance gradients) that are not present in 2D objects. However, are no empirical studies that confirm this hypothesis.

Other authors tested the difference between rendered virtual objects presented on screens and real objects placed in 3D space. Rendering involves creating stimuli in graphic software, which enables the generation of visually rich scenes containing different objects, while successfully simulating depth and various light intensities. When displaying real objects, the amount of light that reaches the eye is the product of reflectance and illuminance. In contrast, virtual objects displayed on screens have no reflectance, which means that variations in luminance must simulate the effects of both reflectance and illumination. Study by Agostini & Bruno (1996) shows that real objects provide more veridical perception than virtual, while the studies by Patel et al. (2018) and Lee & Brainard (2014) produced opposite results.

When an object is simultaneously under multiple illumination levels (e.g. part is in shadow), two parts of the same object have different luminances. Despite these luminance differences, we do not perceive such object as having differently colored parts but, as if the entire object has uniform lightness. Zdravković (2006) has shown, on real 2D objects, that the lightness of the whole object is determined by the part that is in the higher illumination.

In this study we tested the influence of Object dimensionality and Mode of presentation on lightness of multi-lit objects.

Method

There were two experiments, each with two separate groups of participants (N_{E1A} = 19; N_{E1B} = 18; N_{E2A} = 21; N_{E2B}= 19).

The 36 stimuli varied on two experimental and two control factors. The first factor was *object dimensionality*, with two levels: 2D and 3D objects (Figure 1). The second factor was the *mode of presentation*, with two levels: real objects made of paper (E1) and virtual objects (E2). These were created by graphically rendering the previously mentioned physical objects and mapping them into virtual space using the BLENDER software. Furthermore, control factors of object *shape* and *luminance* were introduced.

Experiments were conducted in a viewing chamber placed in a dark room. In the E1, real stimuli were placed on a stand that was in front of the observers. There was a single illumination source in the chamber, in front of which a shadow caster was placed. This manipulation created a scene that contained shadow that split the presented stimuli into two differently illuminated parts (Figure 2, left). In E2 virtual scene and stimuli were presented on a computer monitor that was mounted to the wall which was in front of the participants. The scene contained virtual shadow that split the presented stimuli into two differently illuminated parts (Figure 2, right). The luminances and the sizes of the scene and stimuli were the same in both experiments.

Each stimulus was presented three times in the randomized order. Participants task was to produce lightness matches using the Munsell scale. Within each experiment, separate groups of participants had different *Task types*. One group task was to produce Munsell matches for the whole object and other group only for differently illuminated parts.

Figure 1: Stimuli used in both experiments.

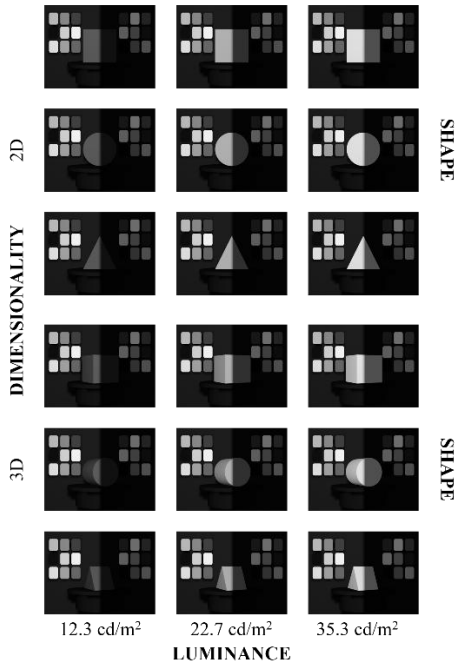
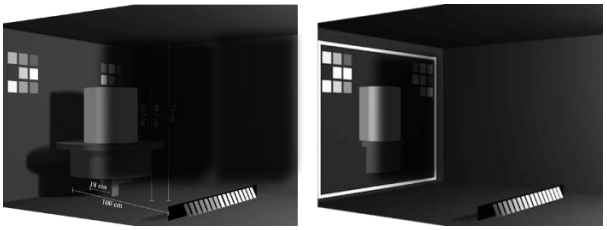


Figure 2: Lab conditions in the E1 (left) and E2 (right).



Results

Experiment 1

The main effect of luminance was significant $F(2,106) = 590.885$, $p < .001$, $\eta_p^2 = .967$, meaning that objects with lower luminances produced lower lightness matches (Figure 3). The main effect of Object dimensionality was significant ($F(1,53) = 52.058$, $p < .001$, $\eta_p^2 = .598$), as 3D objects were perceived as darker than the 2D objects. Lightness of the whole object was different than the lightness of the parts in lower illumination ($F(1,35) = 43.870$, $p < .001$, $\eta_p^2 = .556$). For the parts in the higher illumination, there was interaction between Task type and Luminance ($F(2,70) = 8.480$, $p < .001$, $\eta_p^2 = .195$), indicating that there are no differences between lightness of the whole object and parts in higher illumination for the 22.7, and 35.3 cd/m² conditions.

Experiment 2

The effect of luminance was significant $F(2,116) = 822.981$, $p < .001$, $\eta_p^2 = .934$ (Figure 4). There was interaction between Object dimensionality and Task type ($F(2,58) = 6.450$, $p = .003$, $\eta_p^2 = .182$), which shows that the 3D objects were perceived as darker than 2D objects when judging the lightness of the whole object and the parts that are in higher illumination. Lightness of the whole object was different than the lightness of the parts in lower illumination ($F(1,38) = 254.857$, $p < .001$, $\eta_p^2 = .870$). Lightness of the whole object was not different than the lightness of the parts in the higher illumination ($F(1,38) = .190$, $p = .655$, $\eta_p^2 = .005$).

Experiments 1&2

Comparison between the two experiments reveals the influence of Mode of Presentation. Parts in higher illumination were darker for virtual than for real objects ($F(1,38) = 13.594$, $p < .001$, $\eta_p^2 = .263$). The same effect was obtained for parts in the lower illumination ($F(1,38) = 31.460$, $p < .001$, $\eta_p^2 = .453$). However, the effect of Mode of Presentation was not significant when judging the lightness of the whole object ($F(1,35)=1.557$, $p= .220$, $\eta_p^2 = .043$)

Discussion

Results from the first experiment revealed that real 3D objects appear darker than real 2D objects, and thus appear more veridical. The same is true when judging the lightness of the whole virtual object and parts of virtual objects that is in the higher illumination. The perceptual size of these effects is modulated by the Task type, as the difference between 2D and 3D was .36 Munsell steps for the lightness of the whole object, .41 for the lightness of the parts in HI, and .09 for the lightness of the parts in LI. These results support the idea that photometric characteristics that are present on 3D objects lead to more veridical perception. This effect is much smaller in the shadows, where the luminance range is naturally compressed.

Comparison between the two experiments revealed that there is no difference in judgments for the whole object

Figure 3: Results from E1.

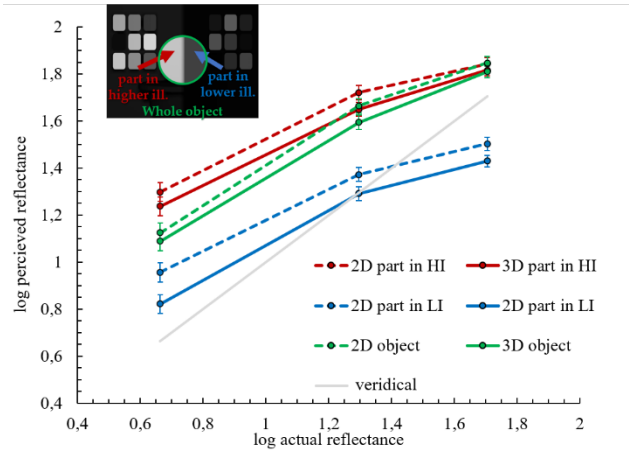
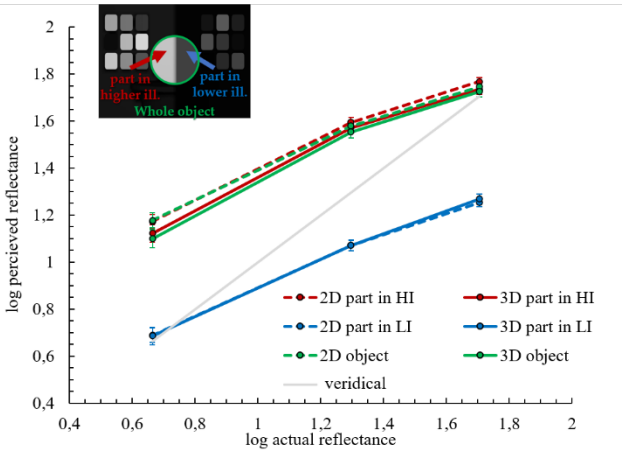


Figure 4: Results from E2.



between real and virtual objects. However, when judging the lightness of differently illuminated parts, virtual objects appeared darker than real objects. This difference was pronounced when judging the parts in LI, as virtual objects on average appeared 1.04 Munsell steps darker than real objects. This difference can be explained by the area that shadow covered in the whole scene. The shadow was much larger in the E1 as it covered stimuli *and* the rest of the chamber, while in E2 virtual shadow covered only part pf the scene that was presented on computer screen.

In this study we also replicated the finding that, for the real and 2D objects, the lightness of the whole object is determined by the lightness of the parts that are in higher illumination. This finding is further extended to both virtual and 3D objects.

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Quantifying the Semantic Similarity of Ambiguous Words as the Similarity of the Affective Dimension of Sensorimotor Experiences

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Abstract

The embodied cognition models postulate that our previous sensory and motor experiences with the world around us form the basis of our representation. Although many sensorimotor norming studies have been conducted so far, very few of them acknowledged the word ambiguity, and none of them measured the subjective experience tied to the sensorimotor experience with an object. For that reason, the goal of this research was to collect the affective sensorimotor norms for separate meanings/senses of ambiguous words in order to contribute to the previous norming practices that neglected the affective, subjective domain of sensorimotor experience. Our prediction was that similarity in two affective dimensions, valence (positive/negative) and arousal (exciting/relaxing) would be in a positive relationship with semantic similarity of concepts, expressed both categorically (ambiguity type) and numerically (speakers' ratings). However, although differences were observed in the predicted direction, no significant effects were found. This novel procedure informed us about the modification of standard norming procedures that are necessary in order to obtain valid data.

Keywords: word ambiguity; embodied cognition; sensorimotor norms; emotional valence; arousal

Introduction

The latest empirical evidence shows that sensory and motor experience is of importance for semantic representation of concepts (Barsalou, 1999; 2008; 2010). Different embodied cognition models agree that representation is at least partially composed of related, modally specific sensorimotor (SM) information deriving from previous SM experience with an object (for review see Meteyard et al., 2012).

Multiple norming studies described the typical SM experience related to words and shown that norms-derived measures of the strength and diversity of SM experience are predictive of processing (e.g. Filipović Đurđević et al., 2016; Lynott & Connell, 2009; 2013; Lynott et al., 2019; Popović Stijačić, 2021). Additionally, the similarity of SM ratings, i.e. SM profiles, is in positive correlation with the semantic similarity, thus suggesting that SM information reflects semantic regularities (Speed & Majid, 2017; Wingfield & Connell, 2023).

However, almost all previous norming studies overlooked the fact that the majority (over 80%; Rodd et al., 2002) of words are ambiguous, i.e. have two or more than one possible interpretation. Thus, the validity of the measures can be questioned, as different interpretations of the same word (e.g. *mouse*) were possible while rating the extent to which it could be seen, heard, touched etc. Only two studies have so far collected the ambiguity-sensitive SM norms (Anđelić & Filipović Đurđević, submitted; Trott & Bergen, 2022). Following the linguistic distinction between words having multiple related (polysemous *senses*) and unrelated interpretations (homonymic *meanings*), Anđelić and Filipović Đurđević (submitted) showed that similarity of SM profiles (SM similarity) was higher in polysemy, i.e. in higher semantic similarity.

The goal of this study is to further refine the norming practice by including the additional aspect neglected in the previous studies – the affective experience related to the SM experience. It is predicted that this refinement would affect the findings, given the evidence that affective valence (positivity/negativity) and arousal (exciting/relaxing nature) are important for representation (Osgood et al., 1957; Zajonc, 1968) and processing (Bayer et al., 2010; Citron et al., 2012; Kensinger, 2004; Kousta et al., 2009; Kuperman et al., 2014; Scott et al., 2012; in the SM domain: Connell et al., 2018; Zhong & Ahrens, 2022).

Based on the findings that related, polysemous senses tend to be more semantically similar than homonymous meanings (Klepousniotou, 2002; Klepousniotou et al., 2008; Yurchenko et al., 2020) and the findings that (non-affective) SM similarity does reflect semantic regularities (Anđelić & Filipović Đurđević, submitted; Trott & Bergen, 2022), our prediction is that similarity of valence of SM experience will be higher in the case of polysemy (related senses) than in the case of homonymy (unrelated meanings). The same prediction holds for arousal. Additionally, we predict that both measures of SM similarity will be in a positive relationship with rated semantic similarity obtained in our previous study (Anđelić & Filipović Đurđević, submitted).

Method

Participants

A sample of 93 first-year psychology students participated in this study as a part of the course credits. All of them signed an informed consent form approved by the IRB of the Dept. of Psychology at the Faculty of Philosophy, University of Belgrade (Protocol #2023-65).

Materials

Starting from the previous database in Serbian (Anđelić & Filipović Đurđević, submitted), we selected 59 ambiguous nouns of the Serbian language.

For each word we selected two ($N = 26$), three ($N = 22$) or four ($N = 11$) meanings/senses, which resulted in a total of 162 meanings/senses. Each meaning/sense was referenced by placing an ambiguous word in a context (e.g. *an album [music]*) and paired with each of the 11 SM scales (e.g. *to hear a music album*), which resulted in a total of 1782 stimuli.

Procedure

The affective SM norms were collected by using the *SoSci Survey* (Leiner, 2024). Participants were instructed to use a seven-point Likert scale (from -3 to +3) to express to what extent the given sensory/motor experience with the concept, is a) (un)pleasant (with -3 being *it completely causes sadness, melancholy, dissatisfaction etc.* and +3 being *it completely causes happiness, satisfaction, hope*) and b) arousing/relaxing (with -3 being *it completely causes calmness, sleepiness, etc.* and +3 being *it completely causes excitement, wakefulness, stimulation etc. [positive or negative]*). Participants also had an option of checking the alternative response, which was: *This experience is not possible.*

Participants rated each of the randomly drawn 100 stimuli (out of 1782) on the valence and arousal scale.

Results and discussion

Analyses were conducted in JASP 0.17.2.1 (JASP Team, 2023). The database is available at OSF.

In the preprocessing phase, we excluded low-motivated participants that overused (>2Sd) the "*This experience is not possible"* option and *neutral* option, leaving us with a total of 90 participants.

We also excluded stimuli that 50% or less participants rated experience as impossible to experience. This step led to a large stimuli attrition, i.e. left us with a total of 1119 stimuli (62.8% of the initial pool).

We then created the same word's meanings/senses pairs (e.g. *an album [music]* and *an album [photo]*), for a total of 184 pairs. However, we only included those pairs that shared 5 or more SM scales. That left us with a total of only 80 pairs.

For every stimulus, we calculated the average rating separately for the valence and for the arousal scale. We then calculated two similarity measures, both by calculating the Pearson's correlation between ratings on SM scales for two meanings/senses that constitute the pair (e.g. two senses of the noun *album*).

The information about the semantic similarity of the pair was taken from our previous research (Anđelić & Filipović Đurđević, 2025), where it was rated on a five-point Likert scale. We classified our pairs as either a pair of homonymous meanings (N = 22) or a pair of polysemous senses (N = 58), following the dictionary criteria (Matica Srpska, 2011).

Although the numeric differences were observed in the predicted direction, homonyms and polysemous words did not statistically differ, neither on the similarity of valence ($M_H = .136$; $M_P = .261$; t (78) = -1.370; $p = .175$), nor on the similarity of arousal ($M_H = .066$; $M_P = .184$; t (78) = -1.253; $p = .214$).

In line with that, although observed in the predicted direction, the continuous measure of semantic similarity also was not in a statistically significant relationship with neither valence (r (78) = .169; $p = .133$) nor arousal similarity measure (r (78) = .152; $p = .179$).

We predicted that the new operationalization of the SM similarity would be reflected in the semantic similarity. Given the more precise information used for SM similarity calculating, we predicted that the new measure would capture and describe the SM profiles of ambiguous words even more precisely. Nevertheless, our findings suggest such is not the case.

On the one hand, our results might imply that the affective component of the SM experience is irrelevant for the representation of (ambiguous) word meaning; that is, that the information about the possible/typical SM information is sufficient on its own and that the subjective dimension adds no informative value. This contradicts the previous empirical evidence (Bayer et al., 2010; Citron et al., 2012; Connell et al., 2018; Kensinger, 2004; Kousta et al., 2009; Kuperman et al., 2014; Scott et al., 2012; Zhong & Ahrens, 2022).

Alternatively, our methodological choices may have played a significant role in the absence of predicted effects. Namely, there was a large percentage of stimuli attrition, stemming from the fact that the affective dimensions could be assessed only for possible SM experiences. By setting the filtering criterion, we lost more than half of the pairs from the initial database, which could be insufficient for planned analyses. Furthermore, the validity of the derived SM similarity measure could be called into question because it is based on an incomplete input.

With this in mind, we suggest that future researchers carry out a better preselection of the initial stimuli pool, potentially including only the words/meanings/senses that have non-zero value on selected SM scales.

Conclusion

The goal of this study was to further refine the process of collecting SM norms for ambiguous words' meanings and senses by collecting the affective ambiguity-sensitive SM norms. Opposed to our predictions, newly introduced measures, similarity of valence and similarity of arousal of SM experience weren't reflecting the semantic similarity of concepts. Further methodological adjustments are needed.

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Trees Before the Forest – Anxiety Fosters Local and Stress Global Processing Bias

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Abstract

Visual attention involves both global and local processing. Research suggests mood can influence this: anxiety narrows attention to local details, while positive emotions promote global perception. Along with growing concerns about screen time and internet addiction (IA), we examined whether these factors also impact visual processing. Forty-six students from the Faculty of Media and Communications completed the Navon task, which measures global/local visual processing, along with reports on weekly screen time, the Internet Addiction Test (IAT), and DASS-21. Global Processing Bias (GPB) was calculated from reaction times on incongruent trials. A multiple regression using the Backward method showed that, while screen time and IA did not significantly predict GPB, anxiety negatively impacted global processing, while stress fostered it. These results suggest that emotional states, specifically anxiety and stress, play a stronger role than digital behavior in shaping how we perceive visual information. Future research should include more diverse samples and refined digital usage measures.

Keywords: Global Processing Bias; Navon task; Attention; Internet Addiction; Mood

Introduction

Imagine walking through a forest. What do you notice first: the entire landscape or individual details – the shape of the leaves, the colors, the texture? Our brain naturally prefers the broader picture, a phenomenon known as global processing, studied by Navon (1977).

Research shows that mood affects visual processing – anxiety promotes focus on details (local processing), while positive emotions enhance global perception (Fredrikson & Branigan, 2005). With increasing screen time today, concerns about internet addiction and its effects, especially on attention, have grown. Wang et al. (2017) found a link between internet addiction and attention disorders. This raises the question: *Can screen time and mood influence how we perceive visual information?*

In real-life perception, we actively select what to notice. A flexible system likely begins with rough, early analysis to guide later, detailed processing. Early impressions help locate stimuli and grasp structure, especially when scenes change quickly. Attention often goes to informative parts (Yarbus, 1967; Mackworth & Bruner, 1970).

Perception is both data- and concept-driven: input initiates processing, but expectations shape it. Evidence suggests global features have an advantage. Peripheral vision, though low-resolution, supports this - coarse global cues guide reading and perception (Williams, 1966; Rayner, 1975). In focused vision, people perceive location first, then figure-ground, global form, and finally detail. Motion perception also supports early global processing (Navon, 1976).

Research links mood with global-local processing (de Fockert & Cooper, 2014; Fredrickson & Branigan, 2005; Gasper & Clore, 2002). For people with depression symptoms, global precedence was absent (de Fockert & Cooper, 2014). Induced sadness reduced global processing, while happiness increased it (Gasper & Clore, 2002). Positive emotions, such as amusement, promoted global perception, although negative emotions didn't always boost local focus (Fredrickson & Branigan, 2005).

Wegener & Petty (1994) argued that affect may regulate cognition in different ways within the same situation. Anxiety enhances local, while positive emotion boosts global processing. Personality traits also influence this: obsessive-compulsive characteristics, marked by anxiety and detail focus, align with local bias (Basso et al., 1996).

Young (1998a) created one of the first internet addiction (IA) measures. Egger & Rauterberg (1996) categorized addiction through self-reported dependency and consequences. Students are vulnerable due to flexible schedules and access (Moore, 1995). In Scherer's (1997) study, dependents used the internet slightly more. A meta-analysis found IA positively linked to ADHD symptoms (Wang et al., 2017).

Considering all of this, we explored whether screen time (ST) and internet addiction (IA) affect attention by applying the Navon task that measures global/local precedence. Due to the frequent link between addiction and mood, we wanted to control that aspect as well.

Method

Participants

Forty-six participants from the Faculty of Media and Communications took part in our research (M = 20.62 ± 2.49 years old; 15.2% male), receiving extra course credit. Participants were native Serbian speakers and had normal or corrected-to-normal vision.

Stimuli

The study employed 16 modified Navon visual stimuli, consisting of large letters ("S" or "H") composed of smaller letters ("S" or "H"). There were eight compatible trials in which the large and small letters matched (big letters consisted of the same small letters), and eight incompatible trials in which the letters did not match. The stimulus lasted for 180 ms, followed by a white screen until a participant touched the screen. A fixation cross for 1000 ms preceded the stimulus. Participants completed 256 trials, divided into two blocks: one focused on identifying small letters (local) and the other on identifying large letters (global). In both blocks, if they saw an H (small or big), they should press the left side of the screen, and if they saw an S, they should press the right side of the screen. Both trial blocks were preceded by exercise with 16 trials.

Instruments

In the questionnaire link, participants reported their weekly screen time (Kaye et al., 2020), followed by the DASS-21 questionnaire (α = .80; 21 items), which has three subscales used to measure anxiety, stress, and depression (Lovibond & Lovibond, 1995), and the IAT. IAT is one of the most popular scales for measuring internet addiction, based on a 5-point Likert scale (*Internet Addiction Test*, Young, 1998b; α = .86; 20 items)

Procedure

The research took place at FMK, involving participants grouped according to their class curriculum. After being informed about the study's anonymity and purpose, they completed the Navon task (Navon, 1977) using their mobile phones. After finishing, they were provided with the link to the questionnaire.

Variables

The criterion was global processing bias (GPB) – the difference between reaction time on incongruent trials in the global and local conditions in the Navon task (a greater difference denotes a stronger GPB). Predictors were independent variables: screen time in hours, the scores on IAT scale, and the scores on anxiety, stress, and depression subscales on DASS-21 scale.

Results

Table 1 presents the Pearson correlations between all the measured variables. The significant ones were found between anxiety and depression, anxiety and stress, depression and stress, IAT and screen time.

Table 1: Pearson Correlations Between the Examined Constructs

(*N* = 46)	GPB	ANX	DEP	STRESS	IAT	ST
GPB	1	-.254	-.114	.053	.095	.023
ANX	-.254	1	.534**	.704**	.160	.104
DEP	-.114	.534**	1	.477**	-.011	-.106
STRESS	.053	.704**	.477**	1	.268	-.009
IAT	.095	.160	-.011	.268	1	.363**
ST	.023	.104	-.106	-.009	.363*	1.000

Note. GPB – RT difference in incompatible cases between Global and Local processing; ANX – anxiety; DEP – depression; ST – screen time

We conducted a multiple regression analysis, using the Backward method. The model including all predictors was not significant: $F(1,40) = 1.75$, $p = .145$. However, the model with only stress and anxiety as predictors reached significance: $R^2adj = .132$, $F(2,43) = 4.43$, $p = .018$. Anxiety was shown to reduce the GPB (ß = -.58, $t = -2.95$, $p = .01$), whereas stress increased the GPB (ß = .46, $t = 2.35$, $p = .02$).

Discussion and Conclusion

After evaluating all models using the Backward method, two predictors showed significant positive correlations with global and local precedence – anxiety and stress. Higher anxiety led to reduced global processing, meaning anxious individuals tend to focus on details. This likely comes from anxiety, narrowing attention, and causing hyperfocus on detail (local processing), especially in threat-related contexts (Eysenck & Calvo, 1992; Mogg & Bradley, 1999; Bishop, 2007). In such cases, the brain prioritizes smaller, immediate cues that may signal danger, contributing to a local precedence orientation. In contrast, stress increases global processing, suggesting stressed individuals are more likely to perceive the bigger

picture. Under stress, people may prioritize broader goals or big-picture thinking to manage cognitive load and decision-making (Henckens et al., 2009). In high-stress situations, they may also rely more on overarching strategies to reduce complexity (Lupien et al., 2007). Unexpectedly, screen time and internet addiction showed no significant impact. Newer research (K. Kaye et al., 2020) suggests using overall screen use instead of screen time, as individuals use various devices or share them. While harder to measure, it offers better insight into digital behavior. While we found no link between screen time and the Navon task, our findings confirm that mood influences how we process information. This has broad implications – from understanding cognition in anxiety to designing emotionally aware digital environments. Future research should utilize a larger, more diverse sample that extends beyond students. We also recommend including more attention-related variables to better understand how emotions, such as stress and anxiety, affect perception.

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The Relationship Between Basic Personality Dimensions and Psychopathic Tendencies in High School Students

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Abstract

This study explored the predictive role of personality traits, based on the Big Five Plus Two model, in relation to psychopathic tendencies in high school students. The sample included 101 students (33 male, 68 female), average age 17.6. Instruments used were the VP+2-70 (short version) and the Psychopathy Assessment Questionnaire (PAQ). Regression analyses showed that aggressiveness and negative valence significantly predicted antisocial behavior, while neuroticism and negative valence were linked to a psychopathic lifestyle. Lower conscientiousness and openness, along with higher aggressiveness, were related to problematic interpersonal traits. Affective psychopathic traits were associated with high aggressiveness, high positive valence, and low negative valence. The findings highlight the importance of personality in the development of psychopathic tendencies. This study is among the first to integrate Hare's psychopathy model with the Big Five Plus Two, emphasizing the relevance of self-evaluative traits in understanding psychopathy.

Keywords: personality; psychopathic tendencies; high school students.

Introduction

Adolescence is a developmental period characterized by intense biological, emotional, and social changes, during which key personality traits are also formed—traits that can have long-term implications for mental health and social functioning. In this context, understanding the psychological factors that contribute to the development of problematic and risky behavior patterns, such as psychopathic tendencies, is of particular importance. Psychopathy in adolescents does not necessarily indicate a personality disorder; however, the presence of affective, interpersonal, and behavioral characteristics similar to those found in adult psychopathy may signal later difficulties in functioning (Sadeh, Verona, Javdani, Olson, 2009).

The Big Five plus Two personality model, developed by Smederevac, Mitrović, and Čolović (2007), was created on the basis of psycholexical studies in Serbia and derived from the Serbian language corpus. This model includes dimensions of aggressiveness and evaluative self-attitudes (positive and negative valence), enables a deeper understanding of the relationship between personality and maladaptive behavior patterns. On the other hand, Hare's model of psychopathy provides a differentiated analysis of psychopathic traits across affective, interpersonal, behavioral, and lifestyle dimensions (Sokić & Ljubin Golub, 2014).

The integration of these two theoretical frameworks opens up the possibility for a better understanding of adolescent psychopathy through the lens of personality. It is essential to identify which personality traits may represent risk factors for the development of psychopathic tendencies, which can contribute to early prevention and intervention in both school and clinical contexts.

Thus, the theoretical foundation of this study is based on:

- The Big Five Plus Two personality model (Smederevac, Mitrović, & Čolović, 2010), which describes personality through seven basic dimensions: neuroticism, extraversion, openness, conscientiousness, aggressiveness, positive valence, and negative valence; and
- Hare's model of psychopathy (Hare, 1991; 2003), which conceptualizes psychopathy as involving four aspects: antisocial behavior, psychopathic lifestyle, the affective dimension of psychopathy, and psychopathic interpersonal traits.

In 2009, Novović, Smederevac, and Biro examined the relationship between the dimensions of the PAQ and LEXI instruments and found that all PAQ subdimensions significantly correlated with negative valence and disagreeableness (aggressiveness). Our study advances these findings by using a more recent instrument—Big Five Plus Two—developed as part of the second psycholexical study in Serbia (Smederevac & Mitrović, 2018), whereas LEXI was a product of the first.

Although psychopathy is one of the key constructs for understanding antisocial behavior, particularly in adoles-

cence, previous research has rarely integrated contemporary personality models with various approaches to psychopathy. Specifically, data are lacking on how personality dimensions from the "Big Five Plus Two" model predict different aspects of psychopathic tendencies in a sample of high school students. This gap in the literature hinders a deeper understanding of the psychological predispositions that contribute to the development of risky behaviours during adolescence.

Therefore, this study aimed to examine the extent to which the basic personality dimensions, according to the Big Five Plus Two model (neuroticism, extraversion, conscientiousness, openness, aggressiveness, positive and negative valence), predict psychopathic tendencies among high school students, including psychopathic lifestyle, antisocial behavior, and affective and interpersonal psychopathic traits.

Method

Participants

The sample consisted of high school students from four secondary schools in Kosovska Mitrovica, totaling 101 participants (68 female and 33 male), with an average age of $M = 17.65$, $SD = .67$.

Procedure

Participants completed two questionnaires:

Big Five Plus Two – Short Version (VP+2–70) (Čolović, Smederevac, & Mitrović, 2014), which contains 70 items equally distributed across seven basic dimensions: neuroticism, extraversion, conscientiousness, openness, aggressiveness, positive valence, and negative valence;

Psychopathy Assessment Questionnaire (PAQ) (Novović, Smederevac, & Biro, 2009), which consists of 40 items equally distributed across four aspects of psychopathy: antisocial behavior, psychopathic lifestyle, the affective dimension of psychopathy, and psychopathic interpersonal traits.

Students completed the questionnaires in school settings, with written parental consent obtained in advance, as the participants were minors.

Results and discussion

The results of the regression analysis indicate that personality traits explain 50.5% ($R = .711$, $R^2 = .505$) of the variance in antisocial behavior ($F(7, 93) = 13.55$, $p < .01$). Additionally, personality traits account for 23.3% ($R = .483$, $R^2 = .233$) of the variance in psychopathic lifestyle ($F(7, 93) = 4.03$, $p < .01$). Furthermore, personality traits explain 27.2% ($R = .522$, $R^2 = .272$) of the variance in the affective dimension of psychopathy ($F(7, 93) = 4.97$, $p < .01$). Finally, personality traits also account for 49.1% ($R = .701$, $R^2 = .491$) of the variance in psychopathic interpersonal traits ($F(7, 93) = 12.83$, $p < .01$).

Table 1: Personality traits as predictors of psychopathic tendencies.

	βab	βpl	βadp	βpit
Neuroticism	-.208	**-.365****	.044	-.148
Extraversion	-.128	.090	-.037	-.078
Conscientiousness	-.017	-.102	-.035	**-.285****
Openness	-.088	.049	-.081	**-.183***
Aggressiveness	**.203***	.203	**.460****	**.248***
Positive Valence	.057	-.200	**.443****	**.289****
Negative Valence	**.609****	**.472****	-.241	**.329****

*$p < 0.05$ $p < 0.01$

Legend: βab - *antisocial behavior;* βpl - *psychopathic lifestyle;* βadp - *the affective dimension of psychopathy;* βpit - *psychopathic interpersonal traits*

The neuroticism dimension in the short version of the questionnaire primarily reflects negative affect and depressive tendencies (Čolović, Smederevac, & Mitrović, 2014). Within the examined sample, the absence of negative emotions and depressive symptoms may indicate a need for constant stimulation, dependence on others, a lack of realistic life goals, and even a parasitic lifestyle.

Considering that low conscientiousness is associated with procrastination, goal disengagement, laziness, and an inability to delay immediate hedonistic impulses in favor of long-term objectives, this may explain the results indicating that such individuals tend to present themselves in an overly favorable light—through grandiosity, superficial charm, and even pathological lying.

Individuals who display stubbornness, anger, and irritability—as indicators of the aggressiveness dimension—are expected to exhibit poor behavioral control, early behavioral problems, and a lack of remorse or guilt.

Positive valence in the short version of the questionnaire is more closely associated with narcissistic tendencies (Čolović, Smederevac, & Mitrović, 2014). With this in mind, individuals with high levels of positive valence may exhibit coldness, shallow affect, and even unscrupulous behavior (Novović, Smederevac, & Biro, 2009).

Negative valence primarily describes a tendency toward manipulative behavior, which may manifest through physical aggression, problematic conduct, conflict with the law, substance abuse, and a propensity toward criminal behavior (Harpur, Hare, & Hakstian, 1989).

The obtained results show that six personality dimensions significantly predict all aspects of psychopathic deviation, that is, personality has been shown to be an important factor in the development of psychopathic tendencies.

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My Better is Better for Me: Exploring Personal and Prescribed Ideal Self in Emerging Adulthood

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Abstract

Emerging adults' (EAs') identity development could be perceived through the lens of their close relationships. Although EAs reach for independence more boldly and tend to maintain intimate relationships, they still vastly rely on parental emotional support and guidance. The main aim of this study was to explore how EAs perceive the features they consider ideal for themselves, in comparison to the features they believe are expected of them by significant others. Participants completed the Self-Discrepancies Scale, listing features of desired and prescribed "self-guides" and answering who they consider significant. EAs estimated (Likert, 1-7) how big they find the discrepancies between personal/prescribed ideal and current self, how much distress this causes them, and how confident they feel to reach the ideal. Participants expressed slightly higher distress with discrepancies, and more confidence in change, concerning personal ideal features. The results stemming from qualitative analysis support the idea of EAs' steady progress towards independence since they relied more on personal self-evaluation and judgment. However, the effects of significant others' authority were still recognizable in EAs' inclinations to ascribe discipline to their expectations.

Keywords: emerging adults; ideal self; significant others; current self; independence

Introduction

This work was part of a broader study aiming to explore emerging adults' (EAs') experiences of identity and self-differentiation. Emerging adulthood (age range between 18 and 30 years) represents a unique developmental period characterized by opportunities for identity exploration, instability, self-focus, and a sense of being "in-between" adolescence and adulthood (Arnett, 2013). Although EAs tend to pursue independence more confidently and actively engage in maintaining intimate relationships, they continue to rely substantially on parental emotional support. Unlike adolescents, EAs often renegotiate and improve their relationships with family members, with a notable reduction in resistance toward them (Arnett, 2015).

The concept of self is a multidimensional construct that includes physical traits, activities, interests, abilities, psychological characteristics, philosophical beliefs, social possessions and relationships, as well as self-evaluations and judgments (Krstić, 2017). Serving as a cognitive framework organizing personal life experiences, the self provides a sense of continuity across time and space, thereby supporting the subjective experience of personal identity. Additionally, the foundation of identity development appears rooted in the internalization of how significant others perceive us, since our self is shaped by our reflections on the evaluations of those important to us (Lacan, 2006). Furthermore, reduced reliance on these external evaluations signals greater self-maturity, also known as self-differentiation (Bowen, 1978).

Main Aim

Building on previous research (Vuletić et al., 2023; Skowron et al., 2004), it is reasonable to assume that EAs occupy an "in-between" position with regard to the previously mentioned identity variables. Accordingly, the central research question focused on this "in-between space" in relation to the ideal self. Given that relationships with significant others continue to play a crucial role in the lives of EAs, this study aimed to explore the nature, importance, and toll of the ideal features participants expect of themselves, as well as the nature, importance, and toll of the ideal features participants believe are expected of them by their significant others.

Method

The Sample consisted of 364 participants aged 18 to 30 (M = 21.45, SD = 2.36), all of whom were university students at the time of the study, enrolled in 19 different faculties across Serbia. Additional relevant sample characteristics are presented in Table 1.

Table 1: Sample characteristics.

Attribute		*Percentage*
sex (female)		81.3
undergraduates		80
living with:	parents	50.5
	partner	7.4

The Instrument applied in this study was the Self-Discrepancies Scale (S-DS), originally developed by Philippot et al. (2018). The questionnaire was translated into Serbian with the author's permission. Among other questions, participants were asked to:

1. make a list of six ideal features they would like or aspire to possess;
2. make a list of six ideal features they believe are expected of them by significant others, and indicate who these "others" are;
3. estimate the overall discrepancy between their ideal self and how they currently perceive themselves (Likert, 1-7) – **Q1**, and the discrepancy between the prescribed ideal self

and how they currently perceive themselves (Likert, 1-7) – **Q2**;

4. estimate the level of distress caused by these two types of discrepancies (Likert, 1-7) – **Q3** (personal ideal), **Q4** (prescribed ideal);
5. and estimate how confident they feel in their ability to reduce these discrepancies (Likert, 1-7) – **Q5** (personal ideal), **Q6** (prescribed ideal).

Results

Firstly, it was important to compute the means and standard deviations of participants' responses for each item: Q1 (M = 3.78, SD = 1.54), Q2 (M = 3.84, SD = 1.54), Q3 (M = 3.28, SD = 1.92), Q4 (M = 2.98, SD = 1.77), Q5 (M = 5.29, SD = 1.70), and Q6 (M = 5.10, SD = 1.80). These values indicate that only the scores related to experienced distress (Q3 and Q4) are slightly below the midpoint of the scale, with somewhat higher standard deviations for both personal and prescribed ideal self.

The main results of the Paired-Samples T-tests corresponding to the main aim are presented in Table 2.

Table 2: The results of the T-tests.

Pairs	*t*	*df*	*sig.*
Q1, Q2	-.784	363	.434
Q3, Q4	4.006	363	.000
Q5, Q6	2.360	363	.019

No significant differences were found between perceived discrepancies of the personal ideal versus current self and those of the prescribed ideal versus current self. However, participants reported slightly higher distress related to those discrepancies involving their own self-image, that is personal ideal features, along with greater confidence in their ability to change these aspects.

When asked to identify the significant others whose expectations they considered while completing the questionnaire, exactly 50% of participants listed their mother first, 13.5% both parents as a couple, 11.3% partner, and 7.1% father. The remaining participants referred to friends, siblings, or extended family members.

Two lists of ideal and prescribed traits were examined using MAXQDA software. All traits were sorted into five higher-order groups or categories, each reflecting a key dimension of self-concept. These categories include *well-being* (optimism, confidence, happiness, etc.), *amiability* (funny, childish, honest, etc.), *curiosity* (perceptive, courageous, creative, etc.), *discipline* (tidy, well-mannered, virtuous, etc.), *accomplishment* (ambitious, intelligent, successful, etc.). Examples of representative features are provided in parentheses. Finally, all features were counted separately within their respective categories.

Table 3 presents the frequencies of the features organized by whether they refer to the personal or the prescribed ideal self, and categorized according to the higher-order self-concept groups.

Table 3: Feature frequencies within high-order groups.

Group	*Frequencies*	
	Personal	*Prescribed*
well-being	41	33
amiability	37	39
curiosity	33	16
discipline	15	36
accomplishment	24	26
Total	150	150

Discussion & Conclusions

The results reveal several key insights. Participants seemed to perceive themselves as positioned somewhere between their ideal self (personal or prescribed) and current self. This may suggest a gradual shift toward a more realistic self-image, which is an expected developmental trend during the emerging adulthood period.

Notably, lower reported stress related to self-discrepancies may reflect the developmental openness and flexibility typical of this life stage, meaning that exploring different identities is encouraged and less constrained. Furthermore, the fact that stress levels were even lower for prescribed features implies that EAs are primarily focused on their own internal standards rather than on expectations imposed by others, however relevant those others might be.

The previous interpretation is further supported by a central finding: a significant difference in distress levels was observed between discrepancies involving the personal ideal versus the prescribed ideal. In essence, EAs might experience more distress when they fall short of their own ideals than when they fail to meet others' expectations, most likely those of parents or significant authority figures.

Additionally, the higher scores for confidence in one's ability to change suggest that EAs are in the process of forming a more stable and coherent self-image. This is reinforced by the final t-test result, which showed that participants expressed greater belief in their ability to shape their identities when doing so in line with their own values and aspirations, rather than external prescriptions.

The present study also demonstrated that the observed differences are not only statistical in nature but also qualitative. When examining the features listed by participants, notable distinctions emerged between those valued by EAs and those they believe are expected by relevant others, primarily parents. One particularly striking finding is that *discipline*, the least frequently mentioned feature in EAs' own ideals, was the second most frequently represented trait in the list reflecting perceived expectations. This suggests a possible divergence between internal and external value systems.

Moreover, participants appeared to believe that their significant others place less importance on *curiosity* compared to other traits, indicating that this characteristic may be undervalued by the caregivers from the perspective of EAs. In contrast, some traits such as amiability and accomplishment were perceived as equally

important by both EAs and their close ones, reflecting shared values or cultural norms that might span generations.

An especially compelling direction for future research lies in understanding why participants believed that significant others (mostly parents) prioritize discipline over well-being. This question may point to deeper themes in the development of EAs' self-image and could reflect broader influences of upbringing within the Serbian socio-cultural context. Unpacking these perceptions could offer valuable insights into how generational expectations shape identity formation during emerging adulthood. In conclusion, further studies might benefit from more detailed qualitative approach, such as narrative analysis.

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Emerging Adulthood: A Period of Loneliness and Stress?

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Abstract

Emerging adulthood (EA) is defined as the period between adolescence and young adulthood, which includes people between the ages of 18 and 29. This stage of life is often seen as a highly turbulent period due to the large number of developmental tasks that an individual needs to solve on his way to adulthood, such as identity exploration, as well as the exploration of interpersonal relationships. Due to the social expectations and demands of the family of origin and individual needs, experiences of intense stress and loneliness can occur. Therefore, this research aims to examine the relationship between the experience of emerging adulthood, loneliness and stress in young people in Serbia aged 18 to 28 years. Findings suggest that those who perceive this period as unstable and filled with identity-related uncertainty are more likely to experience stress and loneliness. Conversely, individuals who see emerging adulthood as a time of personal growth, and self-focus report fewer negative emotional experiences. These insights underline the importance of targeted psychological support and interventions to help young people manage this complex life phase more successfully.

Keywords: emerging adulthood; loneliness; stress; identity.

Introduction

Changes in social and technological domains have influenced individual development and delayed milestones such as leaving the parental home, entering the workforce, marriage, and parenthood. These delays have led to a prolonged transition into adulthood, which is often perceived as stressful and confusing. Arnett (2000) conceptualizes this stage as "emerging adulthood" (EA), a period characterized by identity exploration, instability, self-focus, feeling "in between" and possibilities/optimism. A young person's task is to achieve independence, to establish professional and emotional goals, which may be important sources of stress (Chen et al., 2018) and negatively affect mental health (Arnett et al., 2014).

Research shows that individuals in EA report an increased levels of stress in domains of education, family, relationships, and work (Carstensen et al., 2000; Stefaniak, et al., 2022). Although social support is a protective factor in EA, some research shows that the feeling of loneliness is high especially during this transitional period (Kirwan et al., 2023) and that 40% of youth aged 14 –24 feel lonely (Barreto et al., 2020). Therefore, our research aims to examine the relationship between the experience of EA, loneliness and stress among young people in Serbia.

Method

Sample

Sample consists of 262 randomly selected respondents; collected anonymously, online (70.2 % female, and 29.8 % male); aged between 18 and 28 years (M = 22.38; SD = 2.26). Most respondents finished high school (54.6%), bachelor studies 36.7%, master studies 7.6% whereas only 3 respondents had only elementary school education (1.1 %). Students make the most of the collected sample (77.5 %). Unemployed were prominent over employed (67.6% compared to 32.4 %). Most respondents were not in a romantic relationship (58.8 %), whereas 38.2 % were in a romantic relationship, and 3.1 % were married.

Instruments

Scale of Emerging Adulthood (Radosavljević, Marić, Jovanović & Trbojević Jocić)

For this research, the authors constructed 30 item scale of EA, based on Arnett's theoretical dimensions. The scale was designed for respondents from age 18 to 28 to assess their experience of emerging adulthood, adaptiveness to newly made life expectations and commitments. Exploratory factor analysis conducted on this sample, identified four factors: Instability and questioning of

identity - IQI (α = .669), Possibilities - P (α = .385), Self-focusing - PSF (α = .673), and a period of feeling in between - FB (α = .805). The respondents rated items (e.g., "I often feel lost") on a 5-step Likert scale. Due to the low internal consistency of the Possibilities subscale, it was not included in further analyses.

The scale of perceived stress (PSS, Cohen et al., 1983 according to: Jovanović & Gavrilov-Jerković, 2015)

PSS was used to measure perceived stress in the past month. The scale contains 10 items, created to encompass at what degree the respondents experience their life as unpredictable, uncontrollable and overwhelmed (α =.820).

The scale of loneliness (UCLA, Russell et al., 1980, translation by Lacković Grgin et al., 2002)

To assess the level of feeling loneliness and isolation, the authors used shortened version of UCLA scale that contains 18 items (α =.923).

Results

As it can be seen in table 1, respondents have gotten scores above the theoretical average scores on all three subscales of EA; and higher scores on loneliness compared to the previously conducted research on this population (Ivanov et al., 1998, M = 14.66; Bekavac, 2021, M = 17).

The respondents achieved scores above average on the perceived stress compared to the average results for the population of university students (M = 14.98) and adults (M = 16.39) according to the research conducted on the population in Serbia (Jovanović & Gavrilov- Jerković, 2015).

Table 1: Descriptive statistics of variables.

	M (*SD*)	Min	Max
IQI	36.37(10.85)	15.00	65.00
SF	20.36(4.06)	7.00	30.00
FB	8.69(3.52)	3.00	15.00
UCLA	20.14(14.28)	.00	67.00
PSS	21.11(6.92)	2.00	40.00

To assess the relations between variables, the correlation analysis was conducted, as well as the regression analysis.

There was a statistically significant interrelation between the three subscales of EA. A significant positive correlation was also found between loneliness and perceived stress (Table 2).

Table 2: Results of correlation analysis.

	PSS	IQI	SF	FB
UCLA	.434**	.528**	-.339**	.268**
PSS	*	.656**	-.172	.319**
IQI		*	-.124**	.531
SF			*	-.031*
FB				*

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

As shown in Table 2 there was a statistically significant positive correlation between the subscales instability and questioning of identity, feeling in between and loneliness, as well as between these subscales and perceived stress. In contrast, there was a significantly negative correlation between self-focus and loneliness.

The regression analysis results indicated that the predictive model including three subscales of EA was statistically significant (F(3,261) = 47.176, p < .001) and explained 35.4 % of variance in loneliness.

For perceived stress, the predictive model was also statistically significant (F(3,261) = 67.563, p < .001), explaining 44% of the variance.

As individual significant predictor of loneliness, the scales instability and questioning of identity (β = .495, p < .001) and self-focus (β = -.278, p < .001) were significant. Instability and questioning of identity (β = .664, p < .001), was significant individual predictors of perceived stress.

Discussion

Emerging adulthood (EA), according to Arnett (2000), represents a transitional phase between adolescence and adulthood, where the search for identity and independence may create additional pressure and lead to mental health challenges.

This research aims to explore the links between experiencing EA, loneliness and stress in young people in Serbia.

Findings showed that respondents scored above the theoretical average on all EA subscales, especially instability and questioning of identity.

Additionally, levels of loneliness and perceived stress were higher compared to previous research conducted on a similar population (Ivanov et al., 1998; Bekavac, 2021; Jovanović & Gavrilov-Jerković, 2015), possibly reflecting contemporary social circumstances and the prevalence of digital communication, which may not fully meet the emotional needs.

Instability and questioning of identity and feeling in between were positively correlated with loneliness and perceived stress, whereas self-focus was negatively associated with these indicators of psychological discomfort. These findings suggest that viewing this phase as unstable may increase vulnerability to negative emotions, while viewing it as full of possibilities may foster resilience.

Regression analysis revealed that instability and questioning of identity is the strongest predictor of both loneliness and perceived stress. This result indicates the importance of stabile identity for experiencing emotional well-being. Moreover, self-focus emerged as protective factors, consistent with prior research (Chen et al., 2018; Carstensen et al., 2000; Stefaniak, et al., 2022).

The main limitations of this study can be the unevenness of the sample according to important criteria such as sex. Future research should aim for more balanced samples to enhance the generalizability of findings. Finally, although “The EA scale” is constructed and applied in this research, future pilot studies are needed to

further test its psychometric properties, particularly factor structure and item quality.

Conclusion

This study indicates significant correlation of dimensions of EA with the feeling of loneliness and perceived stress. According to the results of this study, it can be concluded that young people of 18-28 years of age, who perceive period of EA as a period of uncertainty, instability, questioning themselves and their identity, as well as personal and professional values, have tendency toward unpleasant emotional experiences, such as loneliness and stress. On the other hand, people who tend to view this period optimistically, as a period of personal growth, who focus on themselves and on gaining new experiences, have smaller chances to feel stressed and lonely. In this regard, young people in this stage of life are highly vulnerable, so there is a great need for providing support to this population. It is recommended for the future to dedicate special care for creating education programs and support groups with the goal of promoting mental well-being and successful dealing with this transitional period.

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Can Benevolence Cancel Adversity? Direct and Conditional Effects of Benevolent Childhood Experiences on Depression and Anxiety Severity in Adulthood

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Abstract

Adverse childhood experiences (ACEs) are established risk factors for depression and anxiety severity, while benevolent childhood experiences (BCEs) may serve as promotive or protective influences. This study examined how ACEs and BCEs jointly relate to depression and anxiety severity, using data from 838 young adults in Bosnia and Herzegovina. Both ACEs and BCEs independently predicted depression and anxiety severity, acting in opposite directions, with BCEs linked to lower and ACEs to higher severity. However, the overall impact of BCEs was notably weaker than that of ACEs. BCEs also showed small indirect effects through trait resilience, which was associated with better mental health. Evidence that BCEs moderate the effects of adversity was limited, emerging only for depression and only among individuals with very low ACE exposure. These findings suggest that while benevolent experiences can support mental health, they are unlikely to fully offset the consequences of more severe early adversity in general population contexts.

Keywords: Benevolent Childhood Experiences (BCEs); Adverse childhood experiences (ACEs); Resilience; Depression; Anxiety

Introduction

Children are shaped by their earliest experiences and relationships. The presence of safe, stable, and nurturing environments is essential for supporting early brain development and facilitating lifelong well-being and mental health (Kumari et al., 2018; McLaughlin et al., 2019; Merrick et al., 2020). In contrast, negative early experiences, commonly referred to as Adverse Childhood Experiences (ACEs), can cause chronic stress and developmental disruption, increasing the risks of poorer general and mental health outcomes later in life, including higher risks for depression and anxiety (Chen et al., 2022; Felitti et al., 1998; Mersky et al., 2013; Monnat & Chandler, 2015).

However, not all individuals exposed to ACEs develop mental health problems. One possible explanation lies in the presence of positive, protective early-life experiences, sometimes dubbed Benevolent Childhood Experiences (BCEs), which may promote psychological well-being and mitigate the effects of adversity (Ashour et al., 2024; Cunha et al., 2024; Doom et al., 2021; Han et al., 2023;

Nahar et al., 2025; Narayan et al., 2018). While some studies suggest that BCEs can moderate the impact of ACEs, others propose that their effects are additive and compensatory, albeit not necessarily sufficient to fully neutralize adversity-related risks (Cain et al., 2024; Cunha et al., 2024; Han et al., 2023; Hou et al., 2022; Nahar et al., 2025).

BCEs have been conceptualized both as promotive factors with direct, independent effects on mental health, and as foundational contributors to resilience (Cunha et al., 2024; Han et al., 2023; Morris & Hays-Grudo, 2023; Narayan, 2023), which represent a stable trait reflecting one's capacity to recover from stress (Hu et al., 2015; Zimmerman, 2013). When viewed as a separate trait, resilience has been identified as a key mediator through which both ACEs and BCEs may influence psychological outcomes (Chen et al., 2022; Poole et al., 2017; Sever et al., 2024). Yet, few studies have integrated these constructs into a single explanatory framework, leaving unresolved the extent to which BCEs can directly support mental health, indirectly enhance it through resilience, or buffer against the negative consequences of ACEs.

This study aimed to clarify how both BCEs and ACEs relate to adult depression and anxiety symptom severity and resilience capacities, by examining both direct and conditional effects. More precisely, we sought to address the following questions: (1) Are the direct effects of BCEs on depression and anxiety comparable in magnitude to those of ACEs? (2) Can BCEs statistically moderate the relationship between ACEs and depression and anxiety, thereby attenuating the impact of ACEs? (3) To what extent do BCEs contribute to trait resilience, and through it, to depression and anxiety outcomes, relative to the corresponding effects of ACEs?

Method

The study used a convenience sample of 838 young adults from Bosnia and Herzegovina (M=23.12, SD=3.82 years; 65% women; 52% employed; 76% average SES). Data were aggregated from unpublished MSc and PhD pilot studies by several authors, approved by the respective councils. Each wave was collected anonymously via the 1KA platform (1ka.si), in accordance with general Helsinki and EU Commission ethical guidelines.

Participants self-reported childhood BCEs (BCE-10; 10 yes/no categories; Narayan et al., 2018; M = 8.19, SD = 1.93) and ACEs (ACE-14; 14 yes/no categories; Finkelhor et al., 2015; M = 1.68, SD = 2.15), and rated their trait resilience (BRS; six 5-point items; Smith et al., 2008; M = 3.13, SD = 0.78), as well as depression (PHQ-9; nine 0–3 items; Kroenke & Spitzer, 2002; M = 7.23, SD = 5.50) and anxiety (GAD-7; seven 0–3 items; Spitzer et al., 2006; M = 5.85, SD = 4.64).

Analyses were run in JASP (JASP Team, 2023) and SmartPLS (Ringle et al., 2022).

Results

We first examined a model in which ACEs and BCEs predicted depression and anxiety directly (Figure 1A). Both predictors had statistically significant effects, with stronger associations for ACEs. Higher ACEs were linked to more mood symptoms, while higher BCEs predicted fewer symptoms, indicating a modest protective effect. Moderation terms were not statistically significant, suggesting that BCEs may not buffer the negative impact of early adversity on depression and anxiety severity.

When resilience was added as a mediator (Figure 1B), BCEs and ACEs showed equal but opposite effects on resilience. In turn, resilience was associated with lower depression and anxiety, confirming small but significant indirect effects.

Figure 1: BCEs and ACEs as predictors of Depression and Anxiety (A), with Resilience as a mediator (B).

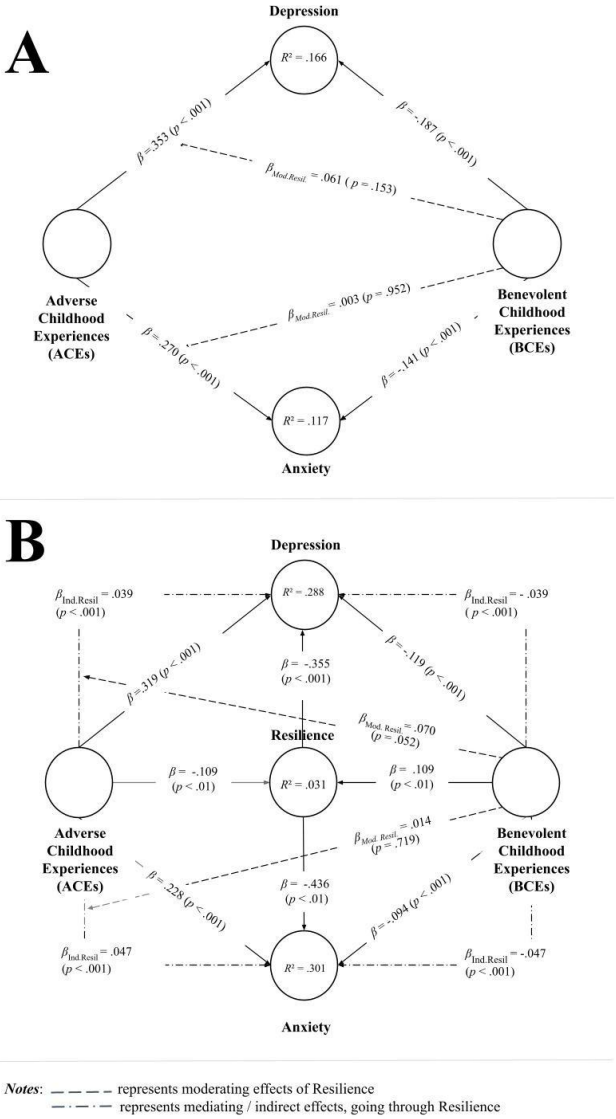
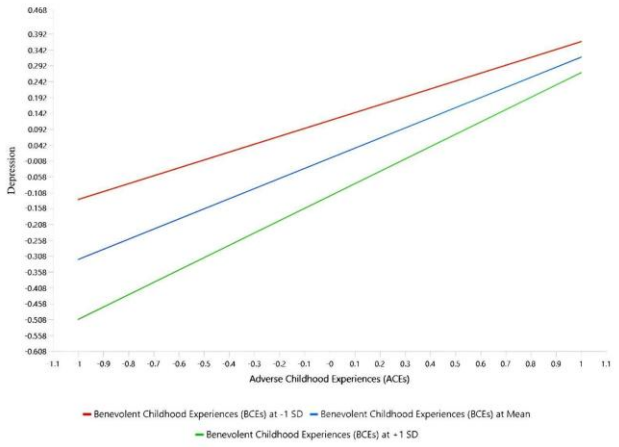


Figure 2: Simple slope analysis for the moderation effect.



A borderline moderation effect of BCEs on depression also emerged with resilience present, indicating slightly weaker decreases in depressive symptoms when BCEs were higher, but only among individuals with low or no ACEs (Figure 2). No moderation was observed for anxiety.

Discussion

This study examined how adverse and benevolent childhood experiences jointly relate to adult depression and anxiety severity. The findings support and extend prior research (e.g., Ashour et al., 2024; Doom et al., 2021; Hou et al., 2022; Narayan et al., 2018), showing that ACEs and BCEs have significant and opposite effects: ACEs were associated with higher, while BCEs were modestly associated with lower depression and anxiety levels.

These findings are consistent with the compensatory model of resilience (Zimmerman, 2013), which suggests that promotive factors contribute independently, offsetting the effects of risk factors. In our analysis, BCEs were associated with better outcomes even when ACEs were controlled, indicating a counteracting influence. Still, the effects of BCEs were weaker than those of ACEs, suggesting that although beneficial, they are unlikely to fully offset the impact of more severe adversity.

Trait resilience partially mediated the effects of both ACEs and BCEs, consistent with prior studies (Chen et al., 2022; Poole et al., 2017; Sever et al., 2024) and theoretical accounts of resilience as a mechanism through which early experiences shape later adjustment (Hou et al., 2022; Zimmerman, 2013). These findings suggest that BCEs may foster resilience-related capacities, which in turn reduce vulnerability to depression and anxiety.

In contrast, moderation analyses did not support a protective model. Within resilience theory, this model describes cases where promotive factors reduce the strength of the relationship between risk and negative outcomes, typically through significant interaction effects (Zimmerman, 2013). In our analysis, the only marginal interaction emerged for depression, and only at very low levels of adversity. The buffering role of BCEs appeared limited to individuals with no or minimal ACE exposure. This is broadly consistent with the threshold-like moderation described by Nahar et al. (2025), who also found that the protective effect of BCEs declines as adversity increases. However, our findings suggest that this threshold is particularly low; based on our data, it can be tentatively extrapolated to up to two ACEs.

These findings are also consistent with recent systematic reviews (Han et al., 2023; Cunha et al., 2024), which concluded that positive childhood experiences more often function as promotive rather than protective factors. The overall picture emerging from our analyses supports the interpretation that ACEs and BCEs are largely independent dimensions of early experience, whose psychological effects accumulate in an additive fashion.

These findings reflect patterns observed in a general population sample, where targeted interventions for ACEs were likely limited. The interplay between adversity, benevolence, and resilience may differ in clinical or high-risk contexts with structured professional support, highlighting the need for further research in such circumstances.

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Adverse Childhood Experiences and General Anxiety: An Individual ACE Category-Based Approach

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Abstract

This study examined how different approaches to operationalizing adverse childhood experiences (ACEs) predict anxiety symptoms. Using a large aggregated convenience sample (N=4834; M=24.92, SD=7.99 years; 68.8% women), we assessed 14 ACE categories and current anxiety via GAD-7. All ACEs were significantly associated with anxiety, though effect sizes were mostly small. Peer isolation/rejection showed the strongest correlation, while parental separation/divorce showed the weakest. Eight regression models were compared. The cumulative summary score model explained the least variance and was outperformed by all other models. The best model included seven Bayesian-selected ACEs, notably emotional and physical neglect, peer adversity, household mental illness, and community violence. Separation/divorce showed a small inverse effect when controlling for other ACEs. A theoretically grouped model with four ACE clusters (abuse, neglect, parental conflicts & separation, and psychopathology & social pathology) also performed well. Results highlight the limitations of cumulative ACE scores and support using selected individual ACEs or theoretically informed aggregates in ACE–anxiety research.

Keywords: Adverse Childhood Experiences (ACEs); Individual ACE Categories; Cumulative ACEs; Theoretical ACE Category Aggregations; General Anxiety

Introduction

Adverse childhood experiences (ACEs) are a well-established risk factor for mental health problems across the life span, including anxiety (Bomysoad & Francis, 2020; Elmore & Crouch, 2020; Hughes et al., 2017; Lee et al., 2020). ACEs encompass various forms of abuse, neglect, household dysfunction, and interpersonal adversity, such as isolation and peer victimization (Finkelhor et al., 2015). Most research to date has used a cumulative risk framework (Felitti et al., 1998), where the number of ACEs is summed and treated as a linear predictor of later outcomes (e.g., Houtepen et al., 2020). While pragmatic, this approach has been criticized for oversimplifying adversity and assuming uniform additive effects across all ACEs (Lacey & Minnis, 2020).

These concerns are especially relevant for generalized anxiety (GAD), characterized by chronic worry and physiological arousal. Although cumulative ACE scores reliably predict anxiety (Bomysoad & Francis, 2020; Hughes et al., 2017; Lee et al., 2020), fewer studies have tested the predictive value of individual ACEs or alternative scoring models. Those that did showed that cumulative scoring can mask differences across adversity types. Elmore & Crouch (2020) identified family dysfunction, violence, and economic hardship as key predictors. In contrast, Topić & Subotić (2023) identified peer isolation, peer victimization, and emotional neglect as the most robust anxiety correlates. Wang et al. (2021) further demonstrated that individual ACEs have varying longitudinal associations with adolescent anxiety, with maltreatment and family dysfunction being particularly important.

Aim of this study is to systematically compare eight plausible models of ACE operationalization and scoring in relation to anxiety (see Figure 1). One treats the revised 14-category ACE framework as a single unweighted sum (Finkelhor et al., 2015), while another treats all 14 categories as separate predictors. Several other models represent derivations based on prior research and/or rationally constructed theoretical groupings of ACE categories (Busso et al., 2017; Hodgdon et al., 2019; Humphreys & Zeanah, 2015; Machlin et al., 2023; McLaughlin et al., 2014; Mennen et al., 2010; Miller et al., 2018; Sisitsky et al., 2023; Vogel et al., 2021), including common prior typologies such as Deprivation and Threat.

This comparative design allows for a targeted evaluation of theoretical, empirical, and context-sensitive models in identifying which ACE configurations best predict anxiety. The key aim is to test whether individual ACEs or their theoretically derived aggregates outperform the cumulative ACE score.

Method

The study used data from a large aggregated convenience sample of 4834 participants (68.8% women; $M = 24.92$, $SD = 7.99$ years). Anxiety symptoms were measured via the GAD-7 (Spitzer et al., 2006), and ACEs via the revised 14-category inventory (Finkelhor et al., 2015).

Eight predictive models were tested (Figure 1): (M1) a traditional summary score; (M2) all 14 ACEs as separate predictors; (M3) a Bayesian-selected subset of seven ACEs; and (M4–M8) theory-based or literature-derived ACE clusters (Abuse, Neglect, Parental Conflict & Separation, Psychopathology & Social Pathology). Model construction followed theoretical and empirical rationale.

Model performance was evaluated using adjusted R^2 (higher is better), and AIC and RMSE (lower is better). Analyses were conducted in R (R Core Team, 2024) and JASP (JASP Team, 2023).

Results

On a bivariate level (Table 1), all 14 ACE categories were significantly associated with anxiety, mostly with small effect sizes.

Peer isolation or rejection showed the strongest correlation, followed by emotional neglect and peer victimization, while parental separation/divorce had the smallest coefficient.

Table 1: Bivariate correlations between ACE categories and anxiety.

ACE categories	r_{pbis}
ACE1: Emotional abuse	.19
ACE2: Physical abuse	.14
ACE3: Sexual abuse	.10
ACE4: Emotional neglect	.26
ACE5: Physical neglect	.13
ACE6: Parental separation or divorce	.05
ACE7: Domestic violence (against mother)	.12
ACE8: Substance abuse in the household	.13
ACE9: Household mental illness	.13
ACE10: Incarcerated household member	.09
ACE11: Peer victimization	.23
ACE12: Peer isolation/rejection	.38
ACE13: Exposure to community violence	.11
ACE14: Low socioeconomic status	.13

Note: All $p < .001$.

To assess predictive utility, eight regression models were compared (Figure 1). The ACE summary score model (M1) was the weakest, while all other models (M2–M8) performed better.

The best model (M3) retained seven ACE categories via Bayesian selection ($BF10 = 9.871 * 10^{114}$): emotional and physical neglect, household mental illness, peer victimization, peer isolation/rejection, community violence, and parental separation/divorce (with a small inverse effect).

M2, with all 14 ACE categories as separate predictors, ranked second.

Among 'rationally grouped' models, M6 performed best, with neglect contributing the most.

Figure 1: Summary and performance of ACE→Anxiety regression models.

No.	Model Variables & Regression Coefficients	Regression Models' performance			
		AIC	RMSE	R^2_{Adj}	Rank
M1	ACE summary score: 1-14 (β=.324, p<.001)	28474.07	4.599	.105	#8
M2	ACE1 – Emotional abuse (β=.015, p=.373) ACE2 – Physical abuse (β=-.003, p=.869) ACE3 – Sexual abuse (β=.017, p=.223) ACE4 – Emotional neglect (β=.068, p<.001) ACE5 – Physical neglect (β=.033, p=.019) ACE6 – Parental separation or divorce (β=-.037, p=.009) ACE7 – Domestic violence (against mother) (β=-.005, p=.730) ACE8 – Substance abuse in the household (β=.012, p=.434) ACE9 – Household mental illness (β=.042, p=.003) ACE10 – Incarcerated household member (β=.012, p=.390) ACE11 – Peer victimization (β=.064, p<.001) ACE12 – Peer isolation/rejection (β=.292, p<.001) ACE13 – Exposure to community violence (β=.046, p<.001) ACE14 – Low socioeconomic status (SES) (β=.004, p=.793)	28184.38	4.457	.159	#2
M3	ACE4 – Emotional neglect (β=.074, p<.001) ACE5 – Physical neglect (β=.037, p=.007) ACE6 – Parental separation or divorce (β=-.032, p=.017) ACE9 (β=.046, p<.001) ACE11 (β=.068, p<.001) ACE12 (β=.296, p<.001) ACE13 (β=.048, p<.001)	28175.08	4.456	.160	#1
M4	ACE summary score: 1-10 (β=.092, p<.001) ACE summary score: 11-14 (β=.297, p<.001)	28359.04	4.544	.126	#5
M5	Abuse (ACE1 + ACE2 + ACE3 + ACE11) (β=.060, p<.001) Neglect (ACE4 + ACE5 + ACE12) (β=.330, p<.001) Family Dysfunction (ACE6 + ACE7 + ACE8 + ACE9 + ACE10) (β=-.004, p=.801) Socioeconomic Stressors (ACE13 + ACE14) (β=.031, p=.030)	28276.68	4.505	.141	#4
M6	Abuse (ACE1 + ACE2 + ACE3 + ACE11) (β=.061, p<.001) Neglect (ACE4 + ACE5 + ACE12) (β=.329, p<.001) Parental Conflicts & Separation (ACE6 + ACE7) (β=-.050, p<.001) Psychopathology & Social Pathology (ACE13 + ACE14 + ACE8 + ACE9 + ACE10) (β=.057, p<.001)	28261.44	4.498	.144	#3
M7	Threat (ACE1 + ACE2 + ACE3 + ACE11 + ACE7 + ACE8 + ACE13) (β=.087, p<.001) Deprivation & Low SES (ACE4 + ACE5 + ACE12 + ACE6 + ACE9 + ACE10 + ACE14) (β=.272, p<.001)	28441.92	4.583	.111	#7
M8	Threat (β=.077, p<.001) Deprivation (ACE1 + ACE2 + ACE3 + ACE11 + ACE7 + ACE8 + ACE13) (β=.280, p<.001) Low SES (ACE14) (β=.016, p=.272)	28419.62	4.572	.116	#6

Discussion

The present study compared multiple operationalizations of adverse childhood experiences (ACEs) in predicting anxiety symptoms, focusing on identifying the most informative predictors. Our results support the notion that cumulative ACE scores, though commonly used, may obscure key differences among adversity types and underestimate their distinct contributions to anxiety (Lacey & Minnis, 2020; Wang et al., 2021). The cumulative model (M1) explained the least variance and was outperformed by all other models.

The best-performing model (M3) retained seven individual ACE categories via Bayesian selection: emotional and physical neglect, parental separation or divorce (negatively associated), household mental illness, peer victimization, peer isolation or rejection, and community violence. These findings align with previous studies highlighting the pronounced role of neglect, peer adversity, and family psychopathology in internalizing symptoms (Topić & Subotić, 2023; Wang et al., 2021). Notably, peer isolation or rejection emerged as the strongest predictor of anxiety in both bivariate and multivariate analyses.

The full individual-items model (M2), though still superior to cumulative scoring, showed that several ACEs had negligible contributions when modeled jointly, reinforcing the need to disaggregate ACEs. One notable case was parental separation or divorce, which exhibited a small negative coefficient once other ACEs were statistically controlled. This should not be interpreted as protective in itself, but rather as an indication that divorce, in the absence of sustained conflict or household dysfunction, may not constitute a significant risk factor for anxiety. Finkelhor et al. (2015) argue that the adverse impact of divorce has likely diminished over time, as it becomes more normative and as parents and professionals adopt strategies to buffer its effects.

Among the 'rationally constructed' aggregate models, M6 (grouping ACEs into abuse, neglect, parental conflict/separation, and psychopathology/social pathology) performed the best. Neglect again stood out as the strongest contributor. These results lend some justification to distinguishing deprivation from threat (Busso et al., 2017; McLaughlin et al., 2014; Miller et al., 2018), but also suggest that alternative groupings based on both theory and empirical synthesis may offer greater utility, as 'hybrid models' may balance conceptual clarity with predictive precision.

In sum, our findings support the shift from default cumulative scoring toward more differentiated approaches, whether through selective ACE subsets or theoretically aggregated domains. Such models enhance both explanatory power and clinical relevance for understanding anxiety-related outcomes.

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Differences in psychopathology symptoms among high school students during (2020) and after (2023) the COVID-19 pandemic

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Abstract

This study compared psychopathology symptoms among high school students in Bosnia and Herzegovina at two cross-sectional time points: during the first wave of the COVID-19 pandemic (2020; *N*=540) and post-pandemic (2023; *N*=227). Using an extended DSM-5 measure, we assessed internalizing, externalizing, and context-specific symptoms, alongside adverse childhood experiences (ACEs), peer victimization, and family conflict. In 2020, students reported higher rates of obsessive-compulsive symptoms, hygiene compulsions, and compulsive exercise. By 2023, behaviors more typical of post-lockdown reintegration (e.g., hyperactivity, substance use) increased. Girls consistently showed higher symptom levels than boys, except for compulsive exercise, which was more prevalent among boys in 2020. Across both assessments, psychopathology was positively correlated (*r*s=.15–.48) with family conflict, ACEs, and peer victimization, with some associations intensifying post-pandemic. Findings suggest a persistent mental health burden beyond the acute pandemic phase, and emphasize the need for interventions attuned to evolving adolescent symptom profiles.

Keywords: Adolescent Mental Health; Subclinical Psychopathology; COVID-19 Mental Health Impact; Pandemic and Post-Pandemic Trends; High School Students

Introduction

Middle and late adolescence represent a critical period of rapid development, characterized by significant social and emotional changes (Guyer, 2020). Adolescents face growing demands from themselves and their environments, contributing to emerging psychopathological symptoms (March-Llanes et al., 2017). For example, the prevalence of subclinical depressive symptoms in adolescents ranges from 17.4% (Magklara et al., 2015) to over 50% (Giannopoulou et al., 2021). A meta-analysis conducted by Shorey et al. (2022) indicates an average global prevalence of depressive symptoms in approximately 35% of adolescents.

Studies indicate that about 30% of adolescents report subclinical levels of anxiety (e.g., Zhang et al., 2021) and about 20% of adolescents exhibit a wide range of externalizing problems (Dooley et al., 2023).

It is important to point out that risks for subclinical psychopathology increased during the COVID-19 pandemic compared to the pre-pandemic period (Madigan et al., 2023; Pedrini et al., 2022). Post-pandemic data indicate that most symptoms persisted at similar or only slightly lower rates compared to the pandemic period (Shukla et al., 2024).

Gender differences were also documented (e.g., Kara & Selcuk, 2024), with girls consistently exhibiting higher levels of psychopathology – internalizing and general (Yoon et al., 2022). Key correlates of adolescent psychopathology include: family conflict, adverse childhood experiences (ACEs), and peer victimization – all positively associated with the symptom severity (e.g., Marcal, 2021; Kingery et al., 2010).

In this study, we aimed to assess a broad spectrum of psychopathological symptoms in adolescents at two cross-sectional time points – during the first wave of the COVID-19 pandemic (2020) and in the post-pandemic period (2023). We focused on differences in symptom prevalence across the two periods. Additionally, we examined gender differences and the main correlates of psychopathology at both time points.

Method

Participants and procedure

We conducted two cross-sectional comparative online assessments among high school students in Bosnia and Herzegovina: *a)* In 2020, during the first wave of the pandemic (*N*=540; 73% girls; *M*=17.21, *SD*=1.13 years). *b)* 2023, i.e., post-pandemic (*N*=227; 79% girls; *M*=17.41, *SD*=1.05 years).

Instruments

The DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure – Child Age 11–17 (American

Psychiatric Association, 2013) includes 25 items covering 12 psychiatric domains (e.g., mood, anxiety, attention). It uses 19 Likert-type items (1 = "never" to 5 = "very often"). For this study, the scale was expanded to include ADHD symptoms, eating pathology, compulsive exercise, and phobic anxiety. Reliability of the total scale was satisfactory (α = .94; ω =.95).

The Revised ACEs Inventory (Finkelhor et al., 2015) covers 14 types of abuse, neglect, and family dysfunction before age 18, with responses marked as "yes" or "no".

The Brief Family Relationship Scale (BFRS; Fok et al., 2011) measures cohesion, conflict, and expressiveness; we used the Conflict subscale to assess links with adolescent psychopathology (α = .91; ω =.91).

Peer victimization was assessed using three items from the PISA survey in Bosnia and Herzegovina (OECD, 2019), reflecting adolescents' experiences (e.g., "Other students threatened you.").

Data analysis

Statistical analyses were conducted in JASP version 0.19.3 (JASP Team, 2024).

Results

During the first wave of the pandemic, high school students reported internalizing symptoms at levels similar to those found in other studies from the same period (e.g., Shorey et al., 2021). Specifically, 30.7% reported symptoms of depression, 20.7% anxiety, and 22.6% somatic complaints. Comparable levels were observed for externalizing symptoms, including aggressive behavior, irritability, and mania.

Table 1: Symptoms with significantly higher frequency during the pandemic.

Symptoms	$\%_{2020}$	$\%_{2023}$	*p*
Depression	30.7	24.7	.04
Aggression	36.7	19.8	<.001
Hygiene compulsions	10.7	1.32	<.001
Compulsive exercise	46.3	15.4	<.001
Sleep problems	33.7	23.4	.01
OCD – repetitive thoughts	16.4	10.3	.02
Psychosis	11.11	4.85	.02

Statistically significant differences between the 2020 and 2023 assessments are shown in Table 1. Although mean scores were slightly higher in 2020 for impulsivity, suicidal ideation, and somatic complaints, these differences did not reach significance.

In contrast, during the post-pandemic period, students reported higher levels of anxiety, hyperactivity, inattention, and substance use, as shown in Table 2. While symptoms of anorexia and bulimia were also higher post-pandemic, these differences likewise did not reach significance.

Regarding gender differences, girls scored higher than boys on most symptoms in both 2020 and 2023. In 2020, they reported significantly more compulsive eating symptoms (t = 4.37, d = 0.43, p < .001), irritability (t = 4.01, d = 0.38, p < .001), panic attack symptoms (t = 3.37, d = 0.35, p < .001), depression (t = 5.51, d = 0.54, p< .001), eating disorder symptoms (t = 4.46, d = 0.43, p< .001), and anxiety (t = 5.90, d = 0.57, p< .001). In 2023, girls reported higher levels of somatic symptoms (t = 3.77, d = 0.61, p < .001), anxiety (t = 3.63, d = 0.59, p < .001), and repetitive thoughts (t = 1.99, d = 0.32, p = .04).

Table 2: Symptoms with significantly higher frequency after the pandemic.

Symptoms	$\%_{2020}$	$\%_{2023}$	*p*
Hyperactivity	25.7	39.6	<.001
Inattention	22.2	33	<.001
Substance use	19.3	27.3	.01
Anxiety	20.7	24.4	.09*

Note: * *p*-value slightly exceeding the conventional threshold (i.e., p>.05)

In 2023, male students reported significantly higher compulsive exercise symptoms (t = -3.17, d = -0.52, p < .001), while in 2020 they scored significantly higher than females only on substance use (t = -1.93, d = -0.19, p = .05).

Table 3: Symptoms with significantly stronger correlations after the pandemic.

	Fischer's *Z*	*p*
Family conflicts		
Inattention	2.27	.01
Smoking	-1.95	.03
ACEs		
Alcohol consumption	.18	.06*
Peer victimization		
Hygiene compulsions	3.2	<.001

Notes: * *p*-value slightly exceeding the conventional threshold (i.e., p>.05). Positive *Z*-values indicate stronger correlations in the 2023 sample, while negative values reflect stronger associations in 2020.

Symptoms were positively correlated with ACEs, family conflicts, and peer victimization (range from .15 to .48). Fisher's Z tests were used to compare correlation coefficients between 2020 and 2023. Statistically significant Z coefficients are given in Table 3.

Discussion

Our findings highlight the presence of context-specific psychopathology during the pandemic, especially infection-related fears, eating concerns, and compulsive exercise. The elevated rates of OCD symptoms, hygiene compulsions, and compulsive exercise in 2020 align with earlier evidence on pandemic-related symptom increases (Madigan et al., 2023). Although symptom levels declined slightly by 2023, some remained above pre-pandemic baselines, indicating ongoing effects on mental health (Patel et al., 2022; Xu et al., 2024) although it remains unclear to what extent these reflect more enduring consequences of the pandemic itself. In contrast, behaviors more common outside the home, such as substance use and school-related problems, increased after the pandemic. These behaviors were restricted during lockdown and therefore showed an anticipated increase in the post-pandemic period, whereas fear-related responses to the pandemic and typical adolescent symptoms were more pronounced during the pandemic itself, as manifestations of stress responses.

Girls consistently showed higher internalizing symptoms, in line with prior research (Yoon et al., 2023), while boys reported more compulsive exercise and slightly more substance use in 2020. Across both periods, symptoms were associated with family dysfunction, ACEs, and peer victimization. Some correlations strengthened post-pandemic, notably between family conflict and ADHD or alcohol use, and between peer victimization and OCD symptoms, consistent with evidence linking victimization to internalizing problems (Kingery et al., 2010).

These results emphasize the importance of assessing a wide range of adolescent symptoms, including both context-specific and typical internalizing and externalizing difficulties. They also point to the need for interventions that are responsive to persistent distress, sensitive to developmental change, and considerate of differences in sociodemographic characteristics and individual experiences of adolescents.

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Understanding The Impact of Maladaptive Schemas on Friends with Benefits Relationships

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Abstract

Friends with benefits (FWB) relationships are defined as friendships that include a sexual element without the commitment (Lehmiller et al., 2011). Understanding predictors of such relationships is crucial, as their blurred boundaries may contribute to unmet expectations and emotional distress (Owen & Fincham, 2011; Vannier & O'Sullivan, 2017). Maladaptive schemas are deep-rooted patterns formed in early childhood that influence an individual's self-perception, social and romantic interactions (Young et al. 2003). To our knowledge, maladaptive schemas were not studied in relation to FWB. This study aimed to explore whether maladaptive schemas can predict involvement in FWB, with specific attention to gender differences regarding this link. The sample consisted of young adults between the ages of 17 and 25 (N=514), the majority of whom were heterosexual (88,9%) and women (92%). Almost half of the participants reported having experienced at least one FWB in their lifetime, and 20,2% reported that they were currently or recently involved in such a dynamic. The Mistrust/Abuse schema was the only significant predictor for involvement in FWB dynamics, and this relationship was not moderated by gender. Our findings suggest that individuals who often expect mistreatment or abuse from others are more likely to engage in FWB.

Keywords: Maladaptive schema, Friends with benefits, relationships, mental health, emerging adults

Introduction

Forming emotionally meaningful relationships is a key developmental task in emerging adulthood. Relational dynamics among emerging adults have diversified, and Friends with benefits (FWB) have become a common form of intimacy. FWB are recurring sexual interactions between friends without romantic commitment or exclusivity (Marques et al., 2024b). Although often seen as casual and low-risk, research shows these relationships are psychologically complex and can have mixed outcomes. This is both due to unmet expectations (Macecha et al., 2024) and social stigma associated with non-traditional relationships, especially laid upon women (Marques et al., 2024a). Negative outcomes can include dissatisfaction, moral conflict, guilt, and depressive symptoms (Grello et al., 2006; Lehmiller et al., 2011; Owen & Fincham, 2011).

Research shows that FWB involvement is shaped by psychological and social factors like attachment style (García Serrán & Soriano Ayala, 2016), personality traits (Buczek et al., 2016), and gender norms. Motivations differ by gender: men seek physical satisfaction, women emotional connection (Maciocha et al., 2024; Villanueva, 2013). Maladaptive schemas are enduring patterns of thought and emotion about the self and others, rooted in early adverse experiences that thwart basic emotional needs (Young et al., 2003). They are grouped into five domains: Disconnection and Rejection, Impaired Autonomy and Performance, Impaired Limits, Other-Directedness, and Overvigilance and Inhibition. Schemas contribute to psychological dysfunction, shape expectations and reactions in romantic contexts, and are associated with maladaptive attachment patterns (Bach et al., 2015). Despite their relevance, they remain unexamined in the context of FWB.

Research problem and aim

Research shows that FWB is shaped by both internal factors such as attachment styles and personality traits, and external factors such as prevailing gender norms. Understanding predictors of FWB is important as these relationships may contribute to impaired wellbeing and depressive symptoms, particularly among women (Grello et al., 2006; Lehmiller et al., 2011; Owen & Fincham, 2011).

A plausible but underexplored mechanism is maladaptive schemas. Of the 18 schemas, those in the Disconnection and Rejection domain - Emotional Deprivation, Abandonment, Mistrust/Abuse, Social Isolation, and Defectiveness/Shame - encode expectations that needs for security, empathy, acceptance, and belonging will remain unmet. We therefore expect these schemas to predict FWB. Given gender differences in

FWB motives and outcomes (Lehmiller et al., 2011), schemas may operate differently across genders; owing to scarce data we will make no direct hypotheses.

This study investigates whether maladaptive schemas predict the likelihood of engaging in FWB and whether this association varies by gender. By integrating schema theory with research on casual relationships, we aim to further clarify the psychological foundations of non-traditional intimacy among emerging adults.

Methodology

Sample

The sample included 514 emerging adults (ages 17–25, M = 22), with 40 identifying as male. Most participants (88.9%) identified as heterosexual. Regarding sexual experience, 4.3% had never engaged in intercourse. Among sexually active individuals, age at first intercourse ranged from 13 to 25. As for FWB involvement, 20.2% were currently or recently (past year) in FWB, and 41.1% reported at least one lifetime FWB experience.

Measures

Participants provided demographic information (age, gender, sexual orientation). Early maladaptive schemas were measured using the Young Schema Questionnaire – Short Form (YSQ-SF; Bach et al., 2015), a 90-item self-report tool assessing 18 schemas across five domains. Items are rated on a 6-point Likert scale (1 = does not apply to me at all; 6 = describes me perfectly), with higher scores indicating stronger schema endorsement. Example items include "I cannot trust people because they will hurt me" (Mistrust/Abuse) and "It is very important for me what others think about me" (Approval-Seeking). Reported internal consistency ranges from α = .53 to .98 (Slepecky et al., 2019); in this study, α = .66 to .91. FWB involvement was assessed with two self-report items: "Are you currently in an FWB or have you been in one in the past 12 months?" and "How many FWB relationships have you had in your life?".

Results

Independent samples t-tests showed that women scored significantly higher than men on Insufficient Self-Control ($t(512) = -2.29$, $p < .05$) and Approval-Seeking ($t(54.28) = -3.28$, $p < .01$). Significant differences across approximately half of the maladaptive schemas were also observed by sexual orientation, spanning four of five schema domains, so further analyses were limited to heterosexuals. While maladaptive schemas did not significantly predict lifetime involvement in FWB (total number of FWB partners), a binary logistic regression revealed that the Mistrust/Abuse was a significant predictor of recent or current FWB involvement, $X^2(1) = 8.27$, $N = 512$, $p < .01$. The odds ratio (Exp(B) = 1.090) indicated that higher Mistrust increased the likelihood of FWB engagement. Gender did not moderate this relationship.

Discussion

The findings suggest that schemas may play a significant role in FWB engagement, with the Mistrust/Abuse emerging as particularly influential. This schema involves the expectation that others will harm, exploit, or mistreat the individual (Young et al., 2003). In the context of FWB, individuals with strong Mistrust/Abuse schema may gravitate towards these arrangements as a protective strategy (Stein et al., 2019). The schema preserves the need for intimacy but redirects it into a form that reduces perceived emotional risk. Avoiding commitment is the most common motive for FWB, though many also emphasize the importance of trust and safety in the partner (Maciocha et al., 2024), highlighting its protective function for those with a Mistrust/Abuse schema. This pattern can become self-reinforcing, as avoiding emotionally corrective experiences strengthens beliefs that close relationships are unsafe. FWB may function both as a coping strategy and a schema confirmation. Lacking genuine care and offering only an illusion of closeness (Trask et al., 2020), FWB can attract those with Mistrust/Abuse schemas by reinforcing beliefs like "people only want me for sex" or "no one can be trusted".

While men and women may engage in FWB for different reasons, the predictive influence of early maladaptive schemas appears consistent across genders. Cultural and emotional factors may affect how schemas are activated/expressed, but they do not fundamentally alter the underlying schema-driven mechanisms that guide relational behavior. While surface-level motivations may reflect gendered socialization, the underlying schema pathways remain consistent across sexes.

The study's limitations should be noted. Small number of male participants limits the generalizability of gender-based interpretations, and the small proportion of participants identifying as homosexual or bisexual and significant differences across schemas precluded analysis of sexual orientation differences.

The findings have important implications for clinical work. Schema-focused interventions that enhance emotional safety, impulse control, and interpersonal boundaries can help individuals build more secure, fulfilling relationships. Therapy should address schemas underlying avoidance and distrust, exploring early trauma and fostering trust. Interventions should prioritize schema profiles over gender-based approaches.

In sum, this study contributes to the growing literature on the psychological underpinnings of non-traditional relationships. It emphasizes the relevance of early maladaptive schemas in understanding young adults' relational behavior and highlights potential pathways for schema-based therapeutic work.

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The Role of Demandingness Versus Derivatives in Clinical and Nonclinical Levels of Depression

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Abstract

Depression is a debilitating disorder, often rooted in the way people interpret and react to negative experiences. While cognitive-behavioral approaches agree that beliefs play a key role, among REBT professionals there is a disagreement about which irrational beliefs contribute the most to the onset of depressive condition. This study set out to explore which irrational beliefs are most closely linked to depression and how they relate to feelings of anhedonia and emotional distress in both clinical and nonclinical populations. A total of 356 participants took part, including first-time inpatients with depression and a sex-matched nonclinical group. They completed questionnaires measuring irrational thinking patterns and depressive symptoms. In the clinical group, frustration intolerance stood out as the key belief linked to both emotional distress and loss of pleasure. Meanwhile, in the nonclinical group, beliefs like awfulizing and self-downing were more strongly tied to depressive symptoms. These findings suggest that different thought patterns may fuel depression depending on whether someone is clinically affected. Still, the results should be viewed with caution, given the unequal sample sizes and the use of convenience sampling.

Keywords: depression; irrational beliefs; demands; derivatives; cbt; rebt

Introduction

Depression is a mental health disorder that affects about 280 million people worldwide (Institute for Health Metrics and Evaluation, 2023) and arises from interacting biological, psychological, and social factors, including genetic predisposition and adverse life events (World Health Organization, 2023).

These factors are conceptualized differently within psychological frameworks such as Rational Emotive Behavior Therapy (REBT), which posits that distress stems not from events themselves, but from the interpretations assigned to those events. Such cognitions are referred to as irrational beliefs and involve absolutistic demands (as the core component) along with derivatives: catastrophizing, low frustration tolerance, and global negative evaluations of the self, others, or the world (Ellis, 1994).

The original REBT-I model identifies demandingness as the primary driver of depression, with derivatives as secondary contributors (Ellis & Dryden, 1997). The REBT-II model (DiGiuseppe, 1996) suggests that each irrational belief independently contributes to depressive symptoms.

This study empirically examines which irrational beliefs are most linked to depression, aiming to help clinicians identify and address the most central ones in therapy to alleviate distress.

Method

Participants

The total sample included 372 participants, of whom 23.7% (N = 88) were clinically depressed inpatients. The clinical group had a mean age of 37.1 years (SD = 15.5), and 68.2% were women.

The nonclinical group (N = 284) was composed of individuals without a history of psychiatric diagnosis, with a mean age of 20.1 years (SD = 6.5), and 65.1% were women. Participants in the nonclinical group were matched with the clinical group by sex.

Instruments

To assess irrational beliefs, participants completed the General Attitude and Belief Scale (GABS-37), a self-report measure which evaluates demandingness, awfulizing, self-downing, and frustration intolerance. Symptoms of depression were measured using the Mood and Anxiety Symptom Questionnaire (MASQ-34), focusing on assessment of anhedonic depression and depressive distress.

Procedure

Participants in the clinical group were recruited during inpatient treatment at the Institute of Mental Health in Belgrade, Serbia. The nonclinical group was recruited from the general population using a convenience sampling method. All participants provided informed consent and completed the measures in a single assessment session, in person.

Results

We found significant differences between clinical and nonclinical group across all measured variables.

Participants in the clinical sample reported elevated levels of general distress, as well as stronger endorsement of irrational beliefs, including demandingness, awfulizing, self-downing, and frustration intolerance, while feelings of anhedonia were more prevalent in the nonclinical sample (Table 1).

Table 1: Descriptive Statistics and Group Comparisons for Clinical and Nonclinical Samples.

Variable	clinical M (SD)	nonclinical M (SD)	*t*(df)	*d*
Anhedonia	58.9 (12.9)	65.8 (8.5)	5.82 (369)**	-0.71
Distress	34.9 (15)	20.8 (10.5)	-9.86 (370)**	1.20
Demandingness	34.8 (9.3)	31.4 (7.9)	-3.38 (367)**	0.42
Awfulizing	17.4 (6.3)	13.9 (4.8)	-5.49 (370)**	0.67
Self-downing	10.9 (5.6)	7.9 (3.5)	-5.99 (369)**	0.73
Frustration intolerance	6.5 (5.4)	4.8 (2)	-6.47 (370)**	0.79

Note. M = mean; SD = standard deviation; *t*(df) = t test with degrees of freedom; *d* = Cohen's d; ** = $p < .001$

Multiple linear regression analyses were conducted separately for clinical and nonclinical sample, with demandingness, awfulizing, self-downing, and frustration intolerance as predictors, and anhedonia and depressive distress as outcome variables.

In patient population, predictive model explained 12.8% of anhedonia ($r = .36$, $r^2 = .13$, adjusted $r^2 = .08$, F (4, 80) = 2.95, $p = .02$), which was solely predicted by greater endorsement of awfulizing beliefs. Irrational beliefs explained 34% of depressive distress ($r = .58$, $r^2 = .34$, adjusted $r^2 = .31$, F (4, 80) = 10.29, $p < .001$), which can be predicted by higher levels of frustration intolerance (Table 2).

Table 2: Multiple Regression Analyses Predicting Anhedonia and Depressive Distress in Clinical Group.

	Anhedonia			Distress		
	β	*t*	*p*	*β*	*t*	*p*
Demandingness	-.15	-1.12	.266	.01	.10	.923
Awfulizing	.55	2.90	.005	.04	.23	.816
Self-downing	-.15	-.98	.328	.23	1.75	.084
Frustration intolerance	-.04	-.24	.807	.38	2.84	.006

Note. β = standardized beta ponders; *t* = t test; *p* = significance

In contrast, the nonclinical group exhibited significant associations between higher levels of anhedonia and pronounced beliefs of demandingness, as well as lower levels of awfulizing. These beliefs explained 6.5% of anhedonic symptoms ($r = .25$, $r^2 = .06$, adjusted $r^2 = .05$, $F(4, 279) = 4.85$ $p < .01$). Regarding feelings of general distress related to depression, three irrational beliefs emerged as significant predictors - demandingness, awfulizing and self-downing (see Table 3), which explained 34% of variance in depressive distress ($r = .48$, $r^2 = .28$, adjusted $r^2 = .21$, $F(4, 279) = 20.42$, $p < .001$).

Table 3: Multiple Regression Analyses Predicting Anhedonia and Depressive Distress in Nonclinical Group.

	Anhedonia			Distress		
	β	*t*	*p*	*β*	*t*	*p*
Demandingness	.27	3.76	.000	-.23	-3.50	.001
Awfulizing	-.26	-2.90	.004	.35	4,29	.000
Self-downing	.10	1.27	.205	.19	2.77	.006
Frustration intolerance	.07	.95	.344	.10	1.43	.153

Note. β = standardized beta ponders; *t* = t test; *p* = significance

Discussion

The results of this study show distinct associations between irrational beliefs and depression depending on intensity and symptom profile. In non-clinical depression with anhedonia, demandingness and catastrophizing are most relevant, while depressive distress is linked to demandingness, catastrophizing, and self-depreciation. In clinically severe depression with anhedonia, catastrophizing is significant, whereas depressive distress relates to low frustration tolerance. Thus, greater depression severity does not necessarily entail more irrational beliefs.

Furthermore, demandingness and its derivatives are strongly linked to depressive symptoms in the non-clinical sample, supporting DiGiuseppe's REBT-II model. In clinical depression, derivatives play a more prominent role than absolutistic demands, though fewer irrational cognitions are involved, suggesting that other factors contribute to major depression. It is important to note that clinical participants were hospitalized with a single depressive episode, so their long-term psychiatric status remains uncertain, as does the significance of various risk factors.

The study also shows that irrational beliefs associated with anhedonia and depressive distress vary within and between clinical and non-clinical groups, supporting a dimensional view of depression (Buch & Liston, 2021; Kroenke, 2017; Zhang et al., 2023), rather than a uniform category, as suggested by traditional cognitive-behavioral models (David et al., 2019).

Limitations include unequal sample sizes, with clinical sample being significantly smaller than the non-clinical, reliance on self-report measures without assessing introspective capacity, and lack of mediational and structural analyses, limiting testing of Ellis's REBT-I model.

Conclusion

Results of this study indicate that lower-intensity depression appears more closely associated with absolutistic demands, catastrophizing, and self-depreciation, while clinical depression is characterized by derivatives such as catastrophizing and low frustration tolerance. Cognitive factors may thus play a greater role in milder forms, whereas severe depression likely arises from a multifactorial interplay of biological, genetic, social, and psychological influences.

Our results underscore the necessity of adopting a dimensional approach to depression and emphasize the importance of tailoring therapeutic practices to address this complexity effectively.

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Development and evaluation of STEAM educational packages: The effects on Serbian students

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Abstract

This paper presents the development and evaluation of STEAM educational packages (EPs) for early primary education within the proSTEAM project, involving Portugal, Italy, Lithuania, and Serbia. Although STEAM is gaining interest, meaningful integration of its disciplines remains challenging, especially with younger students. To address this, the project team created and tested 12 EPs based on common curriculum themes. Evaluation had three phases: (1) assessment of EPs against five groups of quality criteria (Themes adequacy; Implementation phases clarity, Operationalization of activities/tasks; Opportunities for student reflection; Ethics and sustainability), (2) teacher feedback after piloting EPs about various aspects of EPS implementation and student engagement, and (3) students' self-reports on motivation and emotions alongside teachers' evaluations of student outcomes. One EP did not meet quality standards, while overall teacher feedback was positive and informed improvements. In the third phase, 29 Serbian teachers tested three EPs with 608 students aged 7–10 on topics including symmetry, rainfall measurement, and the human body. Results showed average students' motivation scores above 3.4 and emotion scores above 4.1. Teachers reported most students achieved understanding of relevant phenomenon or could analyze and transfer knowledge. These findings suggest positive effects of the EPs on students' motivation, emotions, and achievement.

Keywords: STEAM; primary education; learning motivation; students' emotions; learning outcomes.

Introduction

Despite growing interest in STEAM education, challenges remain in effectively integrating its disciplines, especially with younger students still developing skills for experimentation and reflection (Bassachs et al., 2020; Silva-Hormazábal & Alsina, 2023). To tackle this, the proSTEAM project team, comprising university education professors and primary school teachers from Portugal, Italy, Lithuania and Serbia, developed and tested EPs. The goal was to develop STEAM EPs that could be used across Europe, regardless of GDP or investment in education. It was also important to conduct multiple types of evaluation to ensure their quality.

STEAM EPs Development and Evaluation

First, common themes in the four national curricula were identified. Then, 12 themes were chosen, with university professors and teachers developing three EPs per country: Water and sustainable development goals; Symmetry; Insects; Rainfall measurement; Newton's disc; Human Organ Systems; Pets and how to take care of them; Energy use and climate change; Solar system; Soil; Paper recycling; Experiments with eggs.

Each EP included detailed guidelines on integrating STEAM disciplines, learning goals, lesson activities for students and teachers, required science kits and materials, and a suggested timeframe.

In the first evaluation phase, the project team members from universities assessed 12 EPs using five quality criteria groups.

In the second, teachers, members of the project team, piloted the EPs in four countries. Their feedback guided further improvements.

The third evaluation phase focused on the impact of the EPs on students. Fifteen to 30 teachers per country were trained by the national proSTEAM teams (university professors and teachers involved in EP development and piloting). In each country, three EPs were implemented, one local and two from partner countries. After implementation, students evaluated their emotional response and motivation, while teachers assessed the targeted learning outcomes. Here, we briefly present results from the first two evaluation phases, followed by a summary of the third, which focuses on the effects of STEAM EPs on students in Serbia.

Method

The first phase of evaluation

Five groups of criteria were developed for evaluating the EPs: Thematic adequacy; Clarity of implementation phases; Operationalization of activities and tasks; Opportunities for student reflection; and Consideration of ethics and sustainability. Each group included 4–5 aspects. Twelve project team members from universities assessed whether 20 aspects were adequately implemented using a 4-point scale. Only EPs with an

average score above 2.5 within each group of criteria were approved for further implementation.

The second phase of evaluation

Twelve teachers from the project team implemented the developed EPs and provided detailed feedback on timeframe, learning goals, tasks, teacher activities, and student engagement.

The third phase of evaluation

In Serbia, 29 teachers from five Belgrade primary schools were trained to implement three EPs. They implemented two EPs developed in Italy (Symmetry for 1st grade and Rainfall measurement for 3rd grade), as well as one developed in Serbia for 4th-grade (Human organ systems). Each teacher implemented one EP, consisting of 4 to 6 lessons, with his/her class.

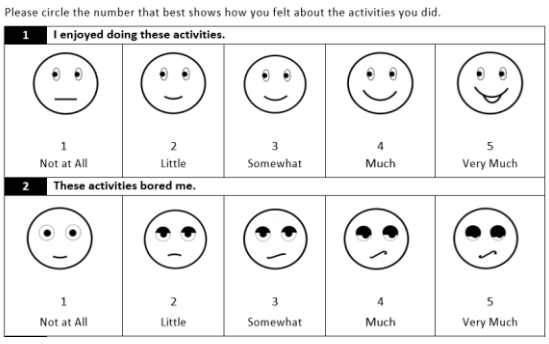
Sample of students included 608 students aged 7-10.

Table 1: Samples within three EPs.

EP - Theme	N	Girls	Age
Symmetry "Dolls"	211	117 (55.4%)	7-8
Rainfall measurement "Rain"	189	97 (51.3%)	9-10
Human organ systems "Human body"	208	89 (42.8)	10-11

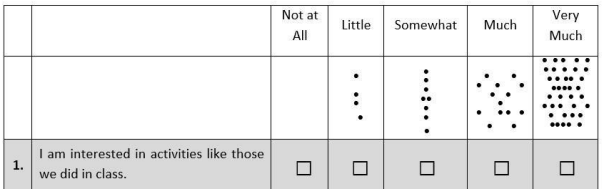
Instruments. After the implementation of an EP, students assessed their emotional response to STEAM lessons using a five-point Likert scale across 12 items, with emojis indicating intensity (Figure 1).

Figure 1: The example of items assessing emotions.



They estimated the motivation to learn through the STEAM approach using 18 items on a five-point Likert scale (Figure 2).

Figure 2: The example of an item assessing motivation.



Teachers assessed each student on a three-point scale, (1 - partial mastery of prerequisite knowledge and skills; 2 - understanding of phenomena; 3- analytical skills and knowledge transfer) evaluating the level to which they had achieved the three educational goals targeted by the implemented EP (See Table 4).

Results

At the end of phase one, the EP "Insects" scored below 2.5 on ethics and sustainability criteria and was excluded from the piloting phase

After piloting, project team teachers gave feedback on the 11 remaining EPs. Accordingly, EPs were divided into more lessons to meet educational goals and allow sufficient time for activities. Tasks were simplified or split into smaller steps to ease student performance and progress tracking. For the youngest students, some materials were adjusted to be more age-appropriate. Teachers' experiences with the STEAM teaching and implementing EPs were generally positive.

The following tables present the results about students' emotions and motivation related to STEAM approach.

Table 2: Students' emotional response to STEAM EPs.

EP - Theme	*N*	*Mean*	*SD*
Symmetry "Dolls"	211	4.15	0.37
Rainfall measurement "Rain"	189	4.13	0.28
Human organ systems "Human body"	208	4.12	0.25

Table 3: Students' motivation in STEAM learning.

EP - Theme	*N*	*Mean*	*SD*
"Dolls"	211	3.74	0.84
"Rain"	189	3.70	0.83
"Human body"	208	3.41	0.84

Table 4 shows average teacher ratings of goal achievement for the three EPs using a 3-level scale (see Method). Because the scale is ordinal, the mode was also calculated. It matched level 3 for the majority of goals, except for the first and third goals in the "Dolls" EP, which were rated at level 2.

Table 4: Teachers' assessment of students' outcomes.

EP-Theme	Learning goal	*M*	*Mode*	*SD*
Symmetry "Dolls"	1. Designing clothing to match the dolls	2.16	2	0.76
	2. Creating dolls based on provided instructions	2.36	3	0.68
	3. Identifying characteristics of symmetry lines on created clothing and properties of symmetric objects	2.03	2	0.78
Rainfall measurement "Rain"	1. Exploring the rain gouge instrument	2.65	3	0.52
	2. Designing a rainwater collection instrument and identifying suitable materials for that purpose	2.61	3	0.54
	3. Constructing the instrument for the collecting rain and measuring its amount	2.51	3	0.60
Human organ systems "Human body"	1. Modeling the connection between the skeleton and muscles of the hand	2.55	3	0.60
	2. Investigating the properties of air and understanding the process of breathing	2.44	3	0.62
	3. Investigating the functioning of the digestive system	2.55	3	0.64

Discussion

To address the challenges of implementing the STEAM approach with young learners, the proSTEAM team was formed, consisting of university education professors and primary school teachers of the first education cycle. The goal was to develop EPs tailored to this population that would be applicable across Europe, but also to evaluate their quality. Results show that only one, out of the 12 developed EPs, did not pass the first phase of evaluation, which was based on five groups of criteria, indicating a generally high level of quality. Teachers from the proSTEAM team provided positive evaluations following the piloting of the EPs, and their feedback was crucial for the subsequent revisions. Self-assessments of Serbian students indicate that they experienced very positive emotions and were motivated to learn in this way. However, responses related to learning motivation were slightly lower and showed greater variability among students, which is worth exploring further. Their teachers reported that most students reached the third level of learning goals, applying analytical skills and transferring knowledge to new situations - one of the core aims of STEAM and modern education (OECD, 2024; Perignat & Katz-Buonincontro, 2019). The next study will investigate in more depth the experiences of teachers who participated in this phase of the evaluation. It will complement the current findings by providing new insights for improving the EPs and highlighting teachers' needs in teaching STEAM.

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The Importance of Pride When Learning Math: The Influence of Academic Emotions and Motivation on Mathematics Achievement

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Abstract

Emotions and motivation are important in students' learning and achievement. This study explored how discrete positive and negative emotions, alongside motivational beliefs such as intrinsic value, utility, and perceived competence, relate to students' performance in mathematics. A total of 644 Serbian high school students completed questionnaires on their emotional and motivational experiences in mathematics. Hierarchical regression analysis showed that positive emotions, particularly pride, were strong predictors of achievement, while negative emotions had little effect. When motivation was considered, pride and perceived competence emerged as the most important factors, while the impact of enjoyment declined. These results show the close connection between how students feel and their confidence in their abilities. They also point to the need for more focus on positive emotions like pride, which may encourage deeper engagement and better performance in school. Understanding how these emotions develop in the classroom could help teachers better support their students' success.

Keywords: academic emotions; motivation; math academic achievement; high school students

Introduction

Emotions are multifaceted phenomena involving coordinated sets of psychological processes, including affective, cognitive, physiological, motivational, and expressive components (Shuman & Scherer, 2014). They represent important aspect of students' academic experience, influencing social interactions, shaping learning processes and outcomes, and supporting personal development within educational contexts (Pekrun et al., 2002). According to Control-Value Theory (CVT), students' emotions in academic settings result from their subjective evaluations of how much control they have over learning activities and outcomes, as well as the importance they assign to those activities and results (Pekrun et al., 2004; Pekrun, 2006). Academic emotions refer to emotional states experienced in academic contexts, such as during learning, classroom participation, or examinations, and in response to success or failure (Pekrun, 2006; Pekrun & Perry, 2014). Control-Value Theory distinguishes between positive and negative academic emotions. Negative emotions, such as anxiety, shame, anger, boredom, and hopelessness, tend to arise when students perceive low control or limited value in academic tasks. These emotions tend to decrease motivation, narrow attentional focus, disrupt self-regulation, and promote surface-level learning or task avoidance (Pekrun, 2006; Pekrun & Perry, 2014; Pekrun & Stephens, 2010). In contrast, positive academic emotions, such as enjoyment and pride, act as significant drivers of achievement-related behavior. (They tend to arise when students perceive high control and assign strong personal value to academic tasks). Enjoyment and pride are emotions associated with increased motivation, the use of deep learning strategies, improved self-regulation, reduced task-irrelevant thinking, and enhanced academic performance (Pekrun et al., 2007; Pekrun et al., 2017).

Along with emotions, the role of motivation in academic behavior has been widely studied, particularly in relation to mathematics achievement (Eccles & Wigfield, 2002; Pekrun et al., 2017). According to the Expectancy-Value Theory (EVT), two key motivational beliefs, expectancies for success and subjective task values, determine students' choices, persistence, and performance in academic settings (Eccles & Wigfield, 2002). Central to this framework is perceived

competence, or students' beliefs in their abilities, which reflect their expectations for success. Therefore, this study examines how intrinsic value, utility value, and perceived competence are related to mathematics learning and achievement. These motivational beliefs are conceptually aligned with CVT, as both frameworks emphasize the role of perceived control and task value in shaping students' academic experiences.

Pekrun and colleagues (2007) argue that emotions and motivation are reciprocally related: motivation can influence the type and intensity of emotions experienced during learning, while emotions, in turn, affect motivation and performance. Some researchers have also explored the mediating role of motivation in the relationship between emotions and achievement, suggesting a mutual and dynamic influence between these constructs and their combined effect on academic outcomes (Kim & Pekrun, 2014; Pekrun et al. 2006).

Aim of the Study

Mathematics represents a particularly rich context for examining academic emotions and motivation, due to its central position in school curricula worldwide and its recognized importance in educational systems. Students often assign high subjective value to mathematics, which may elicit a wide range of emotional responses, from anxiety before important exams to pride following successful performance.

Research on emotions in education has traditionally focused on negative emotions, with particular emphasis on test anxiety, while other emotional experiences, especially positive ones, have been largely overlooked (Pekrun, 2006). In line with recent trends that increasingly highlight the role of positive emotions in academic settings, this study aims to explore the influence of both discrete positive and negative emotions, as well as motivation and demographic variables, on students' academic achievement.

More specifically, the study investigates whether the predictive power of academic emotions changes when students' motivation for learning mathematics is taken into account.

Method

Participants and procedure

The sample was convenient and consisted of 644 Serbian students (69.7% female; Mage = 16.32, SDage = .93)from grammar (65.6%) and vocational high schools (34.4%) who participated in this study. Data was collected in school settings using self-report instruments administered in both paper-and-pencil and online formats.

Measures

Students completed The Academic Emotions Questionnaire – Mathematics scale (AEQ-M; Pekrun et al., 2011; α=.75-.93) for measuring academic emotions related to mathematics. It consists of 60 items (5-point Likert scale) assessing anxiety, shame, boredom, hopelessness, anger, enjoyment, and pride. The second instrument used was The Expectancy-Value Scale (EVS, Peixoto et al, 2023), a 17-item (4-point Likert scale) questionnaire assessing student motivation for learning mathematics, including intrinsic value (α=.89), utility value (α=.80), and perceived competence (α=.85). In addition, students provided information on demographic variables (age, gender, type of school).

Results

To address our research question, we conducted a hierarchical regression analysis in four steps. The criterion variable was mathematics achievement, while the predictor variables are presented in Table 1. The first step ($F(3, 640) = 6.79$, $p < .001$) demonstrates a significant contribution of demographic variables. In the second step ($F(5, 638) = 77.25$, $p < .001$), positive emotions accounted for an additional 34.6% of the variance in mathematics achievement beyond the contribution of demographic variables. In the third step ($F(10, 633) = 42.25$, $p < .001$), negative emotions contributed minimally, and none of the individual variables reached significance. In the final step ($F(13, 630) = 3\ 6.12$, $p <.001$), the inclusion of motivation led to some changes: enjoyment lost its significance, while pride and perceived competence stood out as the strongest predictors of mathematics.

Discussion and conclusion

This study examined the importance of positive and negative discrete emotions in mathematics achievement, taking into account demographic variables. Given the theoretical and practical interplay between motivational and emotional constructs, grounded in the Control-Value Theory and Expectancy-Value Theory (Forsblom et al., 2022; Peixoto et al., 2017), and their relevance for academic success, we also examined whether perceived competence, intrinsic motivation, and utility value contribute to mathematics achievement when demographic factors and emotional variables are considered.

The results indicated that positive emotions significantly contributed to mathematics achievement after controlling for demographic variables. These findings align with previous research (Pekrun, 2006; Xie et al., 2025), which highlights how important positive emotions are in fostering academic performance. Specifically, positive emotions enhance interest and motivation, support self-regulation, promote creative learning strategies, and facilitate attentional focus by freeing cognitive resources (Pekrun et al., 2004; Pekrun et al., 2011). Interestingly, while negative emotions also showed a statistically significant contribution to mathematics achievement, the effect was minimal. Moreover, none of the individual negative emotions made a meaningful contribution, likely due to multicollinearity among emotional variables (Burić & Sorić, 2012; Peixoto et al., 2017). Notably, pride maintained the strongest relationship with mathematics achievement, even after accounting for motivational variables. According to Control-Value Theory, pride emerges when students perceive a high degree of control over their academic performance and assign

high value to the subject, in this case, mathematics. Experiencing pride in response to academic success can foster persistence, deeper cognitive engagement, and a proactive approach to future learning challenges (Pekrun, 2006).

In the context of achievement motivation, pride is closely associated with mastery goals, which are characterized by the intrinsic joy of learning, such as dedicating time to understanding course content and focusing on skill development to attain mastery or achieve high grades (Pekrun et al., 2006). In this sense, interest in mathematics appears to be an integral component of pride. Additionally, as a self-conscious emotion, pride requires self-evaluation (Buss, 2001), making it reasonable to assume that both pride and perceived competence (i.e., the belief "I am able to complete this math task") are critical factors in promoting academic success.

Although extensive research has explored the role of negative emotions in educational settings, our findings highlight the need for further investigation into positive emotions, particularly pride. It is vital to better understand how students experience pride and the specific classroom situations that elicit feelings of pride and competence. While prior research suggests that pride is often cultivated in student-centered, constructivist classrooms (Oades-Sese et al., 2014), further inquiry is needed into how teachers perceive their role in fostering students' pride and sense of competence. These considerations present valuable directions for future research.

Table 1. Hierarchical regression analysis for the prediction of mathematics achievement.

Variable	B	95% CI for B		SE(B)	β	R^2	ΔR^2
		LL	UL				
Step 1						.03	.03**
Age	.21**	.10	.31	.05	.15**		
Gender	.20*	.01	.39	.10	.08*		
School Type	-.03	-.08	.02	.03	-.04		
Step 2						.38	.35**
Age	.19**	.10	.27	.04	.13**		
Gender	.25**	.10	.41	.08	.10**		
School type	-.01	-.05	.03	.02	-.02		
Enjoyment	.16**	.04	.27	.06	.12**		
Pride	.70**	.57	.82	.06	.50**		
Step 3						.40	.02**
Age	.17**	.08	.25	.04	.12**		
Gender	.28**	.12	.43	.08	.11**		
School type	-.02	-.06	.03	.02	-.02		
Enjoyment	.15*	.01	.29	.07	.11*		
Pride	.62**	.49	.75	.07	.44**		
Anger	.13	-.03	.29	.08	.10		
Anxiety	-.13	-.32	.06	.10	-.10		
Shame	-.06	-.18	.07	.06	-.04		
Boredom	.03	-.12	.17	.07	.02		
Hopelessness	-.15	-.35	.06	.10	-.11		
Step 4						.43	.03**
Age	.19**	.11	.27	.04	.14**		
Gender	.28**	.13	.43	.08	.11**		
School type	-.01	-.05	.04	.02	-.01		
Enjoyment	.12	-.03	.27	.08	.09		
Pride	.51**	.37	.64	.07	.36**		
Anger	.13	-.03	.28	.08	.10		
Anxiety	-.07	-.26	.12	.10	-.05		
Shame	-.03	-.15	.09	.06	-.02		
Boredom	.00	-.14	.15	.07	.00		
Hopelessness	-.08	-.28	.11	.10	-.06		
Intrinsic motivation	-.20**	-.36	-.04	.08	-.14**		
Perceived competence	.42**	.26	.57	.08	.29**		
Utility	.07	-.05	.19	.06	.05		

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

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"I Can Handle It!" Psychological Support Seeking among Correctional Officers in Croatia: Preliminary Findings

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Abstract

This study aimed to preliminarily investigate work-related stress, habits related to seeking psychological support, and awareness regarding the availability of psychological support within the prison system among correctional officers in Croatia. Data were collected within a larger ongoing project, and we present the findings here for 761 correctional officers (85% male). Generally, correctional officers in our sample assess their job as somewhat stressful, with males indicating higher levels of work-related stress and work-life imbalance than females. Three-fifths of correctional officers in our sample reported that they did not require psychological support, with no observed gender differences. Although three-fifths of correctional officers in our sample reported knowing how and where to seek psychological support within the system, almost half of those who indicated a need for psychological support did not pursue it. Correctional officers who reported experiencing more stress expressed more need for psychological support but less knowledge of how to seek psychological support within the system. Moreover, correctional officers with more work experience report a greater need for psychological support, and higher work-related stress and work-life imbalance. The obtained results highlight the importance of raising awareness about psychological support for correctional officers in the Croatian penal system.

Keywords: psychological support; correctional officers; prison system

Introduction

Previous findings indicate that correctional officers face a higher risk of work-related stress compared to most other jobs (e.g., Johnson et al., 2005), and the rates of mental health problems and burnout among them are also relatively high (see Clements et al., 2020). In 2018, within the Directorate for the Prison System and Probation in the Croatian Ministry of Justice, Public Administration, and Digital Transformation (Ministry), the Department for Psychological Support for Prison and Probation Officers (Department) and the Team for Psychological Crisis Interventions was established to provide psychological support and psychoeducation for employees in the prison system. Available data from the Ministry (2025) indicate that only up to 10% of prison officers have sought and received psychological support within this Department so far. Thus, we aimed to preliminarily examine work-related stress, habits related to seeking psychological support, and knowledge of psychological support within the Croatian prison system among correctional officers, as well as the relationship between these variables and some basic sociodemographic data.

Method

Data were collected as part of a larger ongoing project, *Psychosocial Climate and Individual Characteristics of Prisoners and Prison Officers in Penal Institutions in Croatia: A Multi-Method Approach (PRISCLIM)*, in all penal institutions across Croatia. Prison officers were invited to participate in the research, and a questionnaire specifically designed for this project was handed to them in envelopes to ensure anonymity and data confidentiality. Participation was voluntary, and after handing in the sealed envelopes, participants received a €5 coupon as compensation for their participation. An Institutional Review Board approved all the aspects of the study.

We present the findings here for 761 correctional officers (85% male; M_{age} = 42.55, SD_{age} = 9.88). Two-fifths (39%) of them reported having more than 20 years of work experience, one fifth reported having between 15 and 20 years of work experience, 14% between 10 and 15 years of work experience, 11% between 5 and 10 years, and 16% had up to 5 years of work experience.

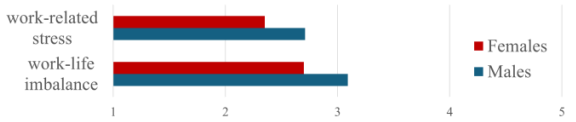
Stress was measured with two items (on a Likert scale ranging from 1 = *not at all* to 5 = *to a large extent*) assessing how stressful participants feel at work, and to what extent their job interferes with their leisure and/or family time. Habits related to seeking psychological support were assessed by single questions with dichotomized answers (*Yes/No*), asking whether participants felt a need for psychological support, whether they pursued it within and outside the prison system, and whether they were aware of how and where to seek

psychological support within the system. Finally, we asked a single question on reasons (*private, professional, both private and professional*) for seeking psychological support.

Results

In general, as shown in Figure 1, the correctional officers in our sample rated their jobs as somewhat stressful. Interestingly, male officers reported experiencing more stress than their female counterparts ($t(737) = 2.59$, $p = .010$, $d = .29$). Additionally, the imbalance between work and life was more significant among males compared to females ($t(739) = 2.95$, $p = .003$, $d = .33$).

Figure 1: Gender differences in stress assessment.



Regarding the need for psychological support, 59% of correctional officers reported never having this need, with no significant gender differences observed ($\chi^2(1, N = 721) = 0.65$, $p = .789$). Among those who did report needing psychological support, 32% sought assistance from outside the prison system, while 16% looked (also) for support within it. Notably, almost half (46%) of the correctional officers who indicated a need for psychological support did not pursue it, and nearly one-third (29%) cited professional reasons for their need. Finally, three-fifths (61%) of the correctional officers in our sample reported knowing how and where to seek psychological support within the system, with females being more likely to indicate knowing this information ($\chi^2(1, N = 741) = 5.70$, $p = .017$).

The relationship between (1) seeking and (2) knowledge of psychological support, (3) work-related stress and (4) work-life imbalance, (5) gender, and (6) work experience is presented in Table 1.

Table 1: Correlations between variables.

	1	2	3	4	5
2	-.20*				
3	.46*	-.26*			
4	.40*	-.21*	.65*		
5	-.01	.09	-.10*	-.11*	
6	.15*	.01	.13*	.09*	-.06

Notes. Seeking and knowledge of psychological support were coded 0 – no, 1 – yes, and gender was coded 1 - male, 2 – female. Pearson's correlation coefficient is presented for all variables except for work experience, for which Spearman's Rho is presented.

* $p < .01$.

Correctional officers who reported experiencing more stress expressed more need for but less knowledge of how to seek psychological support within the system. Moreover, correctional officers with more work experience reported a greater need for psychological support and experienced more work-related stress and work-life imbalance.

Discussion

Contrary to the usual finding that females experience more stress and burnout, regardless of whether they are in so-called male-typed or female-typed occupations (Purvanova & Muros, 2010), our results indicated that the levels of both work-related stress and work-stress imbalance were higher in male than in female correctional officers. It is possible that other variables (e.g. work tasks, the amount of time spent in direct contact with prisoners, which is generally lower for female correctional officers working in male penal facilities than for their male colleagues) influenced this finding, and this finding warrants a more thorough investigation through qualitative methods.

Moreover, three-fifths of our sample reported that they did not need psychological support. Although the good part of correctional officers reported knowing how and where to seek psychological support within the system, a significant proportion of those who indicated a need for psychological support did not pursue it. Furthermore, those experiencing more stress expressed more need for but less knowledge of how to seek psychological support within the system. This highlights the importance of the Department for Psychological Support's existence within the Croatian prison system, and the need for their even more active work and more visible activities supported by officers' management. Additionally, future research should more thoroughly investigate why correctional officers do not seek psychological support when they need it.

Some limitations should be considered when interpreting the results of this preliminary study. Primarily, as participation was voluntary, there is a possibility that self-selection influenced the results. For example, participants in the research may have been generally more positive about psychological research and seeking psychological help. Moreover, the data collection in every penal institution lasted only for a couple of days; thus, the employees on vacation or sick leave were excluded. Finally, a significant gender imbalance was observed, and additional data sources should be used to support and further explore the obtained results.

Conclusion

Although preliminary, the obtained results highlight the importance of raising awareness about psychological support for correctional officers in the Croatian penal system. Furthermore, these findings could help in developing programs that enhance knowledge and promote the use of psychological support within the Croatian prison system.

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Which Emotions to Foster? High- and Low-Arousal Positive Emotions as Mediators between Psychological Safety and Work Engagement and Satisfaction

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Abstract

This study explored how high- and low-arousal positive emotions mediate the relationship between psychological safety and two distinct work outcomes: engagement and job satisfaction. Drawing on the broaden-and-build theory, we hypothesized that psychological safety would be positively associated with both outcomes via different emotional pathways. The sample consisted of 279 employees (61.3% female, M_{age} = 35.28, SD = 7.66) from various organizational settings. Measures included the Psychological Safety Scale, the Job-Related Affective Well-being Scale, the Utrecht Work Engagement Scale, and a single-item measure of job satisfaction. Mediation analyses were conducted. Results indicated that both high- and low-arousal positive emotions mediated the relationships between psychological safety and the two outcomes. High-arousal emotions had a stronger mediating role for engagement, while low-arousal emotions were more prominent for satisfaction. The mediation pattern was indirect-only for engagement and partial for satisfaction. Findings highlight the differentiated emotional mechanisms through which psychological safety supports motivational and evaluative aspects of well-being, offering practical implications for tailoring workplace interventions to foster specific emotional climates.

Keywords: psychological safety, high-arousal positive emotions, low-arousal positive emotions, work engagement, job satisfaction

Introduction

In modern workplaces, organizations increasingly recognize the importance of cultivating environments that promote not only performance, but also employee well-being. One of a key component of such environments is psychological safety—the shared belief that one can speak up or take interpersonal risks without fear of embarrassment, rejection, or punishment (Edmondson, 1999). Psychological safety has been robustly linked to adaptive work behaviors, including voice, learning, and innovation (Newman et al., 2017; Frazier et al., 2017).

Drawing on Fredrickson's broaden-and-build theory (2001), which posits that positive emotions expand individuals' thought-action repertoires and build enduring psychological resources, scholars have begun to investigate the affective pathways through which organizational climates foster individual flourishing (Peethambaran & Naim, 2025). Importantly, not all positive emotions are the same—they differ in intensity and motivational orientation. High-arousal positive emotions, such as enthusiasm and excitement, are typically associated with approach-oriented behaviors and energy mobilization, whereas low-arousal positive emotions, such as calm and contentment, tend to support reflective processing and psychological stability (Russell, 1980; Tsai et al., 2006).

These differences have meaningful implications for differentiating between work engagement and job satisfaction—two commonly conflated, yet theoretically distinct outcomes. Work engagement is defined as a motivational state characterized by vigor, dedication, and absorption (Schaufeli et al., 2002), while job satisfaction reflects a more passive evaluative judgment about one's job and conditions (Judge et al., 2001). Although both are positively valenced, they are supported by different emotional and cognitive processes, and may be differently influenced by workplace dynamics and individual affective experiences (Saks et al., 2022; Sonnentag et al., 2021).

Despite accumulating research on psychological safety and its benefits, few studies have examined how different types of positive emotions may serve as mediators linking psychological safety with engagement and satisfaction. Unpacking these mechanisms is crucial not only for theory development, but also for practical interventions aimed at cultivating emotionally intelligent workplaces. By clarifying which emotional experiences are most conducive to which types of outcomes, organizations can tailor strategies to build specific forms of well-being.

This study addresses this gap by examining how high- and low-arousal positive emotions mediate the relationship between psychological safety and two distinct work outcomes: engagement and job satisfaction. In doing so, it seeks to contribute both to theoretical refinements in organizational affect research and to practical insights for designing emotionally attuned work environments.

Method

Sample

The sample included 279 employed participants (61.3% female), aged 20–52 (M = 35.28, SD = 7.66), all with at least one year of work experience (M = 7.47 years). Most held a university degree (69.9%), lived in urban areas (90.3%), and worked in the private sector (61.3%). Initial exclusions were based on work tenure, supervisory status, and multivariate outliers (Mahalanobis distance).

Measures

Psychological safety was assessed using the 7-item scale by Edmondson (1999).

Positive emotions were assessed using the short form of the JAWS (Van Katwyk et al., 2000), which includes four affective dimensions based on valence and arousal. Two of these dimensions capture high (HPHA) and low (HPLA) arousal positive emotions.
Work engagement was measured with the UWES-9 (Schaufeli & Bakker, 2003).
Job satisfaction was measured with a single-item scale (Dolbier et al., 2005).

Results

Table 1 displays the means, standard deviations, reliability estimates, and intercorrelations for all study variables.

Table 1: Bivariate correlations and descriptives.

	1	2	3	4	5
1. Psy Safety	-				
2. HPHA	.46**	-			
3. HPLA	.51**	.69**	-		
4. Satisfaction	.48**	.56**	.66**	-	
5. Engagement	.42**	.89**	.77**	.66**	-
M	3.64	3.33	3.50	5.36	3.61
SD	.79	.97	.96	1.25	.87
α	.80	.94	.95	-	.91

All correlations were positive and significant at $p < .01$, indicating moderate to strong associations between psychological safety, emotional variables, and outcomes. Internal consistency values were acceptable to high across all scales.

To examine the mediating role of high- and low-arousal positive emotions in the relationship between psychological safety and work outcomes, two separate mediation models were estimated using the mediation package in R (Tingley et al., 2014).

Table 2: Direct, indirect, and total effects.

	Mediator	Effect Type	*B*	95% CI	*p*
Engagement	HPHA	Indirect	.35	[.26, .43]	< .001
	HPLA	Indirect	.18	[.14, .24]	< .001
	—	Direct	-.07	[-.13,.01]	.016
	—	Total	.28	[.16, .40]	< .001
Satisfaction	HPHA	Indirect	.13	[.03, .21]	.012
	HPLA	Indirect	.36	[.23, .54]	< .001
	—	Direct	.27	[.10, .44]	< .010
	—	Total	.63	[.44, .83]	< .001

Note. Confidence intervals based on 1000 nonparametric bootstrap simulations.

Psychological safety was positively related to both engagement and job satisfaction, with high- and low-arousal positive emotions acting as partial mediators. High-arousal emotions had a stronger mediating role for engagement, while low-arousal emotions more prominently mediated satisfaction. The direct effect of psychological safety on job satisfaction remained significant, whereas the direct effect on engagement was not statistically robust, as the confidence interval included zero. This suggests that psychological safety may contribute to engagement primarily through affective mechanisms.

Discussion and Conclusion

The present study provides evidence that psychological safety is significantly associated with both work engagement and job satisfaction, and that these relationships are partially mediated by high- and low-arousal positive emotions. In line with the broaden-and-build theory (Fredrickson, 2001), the findings demonstrate that emotional experiences play a central role in linking interpersonal workplace climate with motivational and evaluative outcomes.

Specifically, high-arousal positive emotions (e.g., enthusiasm, excitement) more strongly mediated the relationship between psychological safety and engagement. This suggests that feeling psychologically safe allows employees to experience energizing emotions that drive active involvement and persistence in tasks even in the absence of a direct effect. Conversely, low-arousal positive emotions (e.g., calm, contentment) were more salient in the pathway toward job satisfaction, reflecting the role of emotional stability and psychological comfort in shaping overall job evaluations.

Importantly, the direct effect of psychological safety on engagement was not statistically robust, suggesting that its contribution to this outcome may occur primarily through high-arousal positive emotions. In contrast, the relationship with job satisfaction included both direct and indirect effects. These findings emphasize the emotional mechanisms through which psychologically safe climates shape different facets of well-being, and suggest that engagement, in particular, may depend more on energized affective states than on structural or relational factors alone.

From a practical standpoint, the results underscore the importance of cultivating emotionally diverse and psychologically safe work environments. Organizations aiming to enhance engagement should focus on practices that stimulate energized positive affect, such as recognition, dynamic teamwork, and development opportunities. In contrast, promoting job satisfaction may benefit more from strategies that support emotional stability, such as role clarity, supportive leadership, and workload balance.

Future research may extend these findings by examining temporal and cross-cultural dynamics of affective mediation, as well as individual differences such as affective style and personality. Given that engagement and satisfaction are often measured as multidimensional constructs, future studies should explore how specific facets relate to psychological safety and emotional arousal. Still, the present findings offer practical value: fostering psychological safety is not only ethically sound,

but also a strategic approach to building emotionally supportive and sustainably engaged workplaces, especially by enabling positive emotional climates that sustain engagement and satisfaction.

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I Can Do It Myself! The Interplay between Female Managers' Self-efficacy, Family Support and Work Engagement

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Abstract

The aim of this mixed-method research was to scrutinize how self-efficacy, as a substantial psychological resource, relates with family support, and female managers' work engagement. The sample for quantitative study consisted of 97 women in managerial positions. The qualitative study comprised 10 face-to-face, semi-structured interviews with female managers, designed to explore the meaning of family support in relation to their overall work efficiency. The results of the quantitative study have shown that self-efficacy mediates the relationship between family support and work engagement. The qualitative analysis showed that female managers' experiences of self-efficacy and work engagement were closely tied to the general care and emotional support they received from their families, whereas tangible assistance played a less central role. Recognizing how family support contributes to female managers' engagement could serve as an important foundation for work psychologists, HR professionals, and policymakers when designing interventions to support women's leadership, their career sustainability, and long-term success.

Keywords: family support; self-efficacy; work engagement; female managers; Serbia

Introduction

The twenty-first century was a major turning point when it came to increasing the number of women in managerial positions. Research (e.g., Cerrato & Cifre, 2018; Sharma & Kaur, 2019) shows that women in managerial positions often experience reduced work engagement due to various negative organizational practices, while simultaneously maintaining primary responsibilities at home. It seems that the tension between work and family obligations, and different expectation is a common challenge for many women. According to some research (Bani Hani et al., 2013), it could be claimed that, due to the way work engagement is conceptualized, in combination with how working organizations are managed, men are more likely to achieve full engagement at work.

According to the Job Demands–Resources (JD-R) model (Demerouti & Bakker, 2011), different forms of support (e.g. organizational support, family support) could act as important resources that enhance employee engagement, job satisfaction, and reduce burnout. These resources not only diminish the impact of job and organizational demands but may also foster the development of personal resources (e.g., optimism, hope, self-efficacy), which strengthen employees' ability to cope with stressors and obtain higher levels of work engagement.

For example, in qualitative study involving Finnish women managers, it was concluded that a male spouse who is willing to provide various forms of support is often perceived as having a positive influence on their careers (Heikkinen et al., 2014). In a similar vein, a study of Korean married female managers has shown that supportive leadership and family social support positively influenced female managers' positive spillover between work and family (Park et al., 2023).

The aim of this mixed-method research was to scrutinize how self-efficacy, as a substantial psychological resource, relates with family support, and female managers' work engagement. Firstly, we have analyzed how family support relates to engagement, and then we have tested the mediation role of self-efficacy on this relationship (Study 1). We then adopted a qualitative approach (Study 2) to gain deeper insights into how self-efficacy, an important aspect of psychological capital for female managers, relates with engagement and productivity. We have also examined the significance of family support, specifically focusing on the types of support that are most valuable for women in managerial positions.

Method

Procedure and Sample

The sample for Study 1 consisted of 97 women in managerial positions, mean age 45.04 (*SD* = 8.53), average years of experience 20.18 (*SD* = 7.78). The majority of women in the sample hold at least a bachelor's degree (85.6%), and they lead 25.58 employees in average (*SD* = 53.97). The qualitative study included 10 face to face, semi-structured interviews with female managers (mean age of 44) with the aim to explore the role of family responsibilities and family support on female managers' work efficiency in general. All participants work in medium-sized companies and manage teams of at least five employees. They all live with both partners and children.

The sample from the first study was a convenience sample, and participants were recruited through calls and announcements posted on social media and through personal contacts. An online questionnaire was administered using the Google Forms platform. Research participation was anonymous, voluntary, and non-compensated, participants were informed that they could withdraw from the survey at any point of time without consequences. Study 1 draws on a secondary analysis of data from the first author's master's thesis (Jovanović, 2024).

Study 2 used targeted sampling of women in managerial positions with over six months of tenure, regardless of their age, profession, or education. The interviews lasted about 60 minutes. As for the quantitative study, participation was also anonymous, voluntary, and non-compensated, interviewees were informed that they could withdraw at any point of time without consequences. The qualitative research was approved by the Institutional review board of the Department of Psychology, Faculty of Philosophy, University of Belgrade, Serbia.

Instruments

Work engagement was measured by The Utrecht Work Engagement Scale, UWES-9 (Petrović et al., 2017; Schaufeli et al., 2004; *Cronbach's alpha* = .90) followed by 0-6 Likert scale. Self-efficacy was measured by using self-efficacy scale from International Personality Item Pool, *Cronbach's alpha* = .92, each item followed by 1-5 Likert scale. Family support was measured with three items derived from The Family Support Inventory for Workers (King et al., 1995), *Cronbach's alpha* = .79, items were rated on a 5-point Likert scale. The data for Study 2 were gathered based on the questions covering topics related to family support type, its relationship with engagement, role of psychological capital, and its relation to women productivity in general.

Data analysis approach

Quantitative data were analyzed using IBM SPSS 21 software with PROCESS macro (Hayes, 2013). The data from the qualitative study were analyzed through qualitative content analysis (Flick, 2014).

Results

As it can be seen from Table 1, the negative skewness values across all variables indicate that the most women reported increased levels of family support, work engagement and self-efficacy. Kurtosis values for work engagement and self-efficacy suggest approximately normal distributions, while family support showed a higher positive kurtosis, indicating a more peaked distribution.

The correlation analysis have shown that family support (r = .35, p < .01) was positively related to work engagement. Apart from that, self-efficacy was positively related with family support (r = .44, p < .01), and work engagement (r = .50, p < .01). The mediation analysis has shown that self-efficacy mediates the relationship between family support and work engagement, b = .60, p = .00, *CI* [.22, 1.15].

Table 1: Means, standard deviations, skewness and kurtosis for family support, work engagement, and self-efficacy

Variable	*M*	*SD*	*Skewness*	*Kurtosis*
Family support	4.39	0.71	-1.75	4.63
Work engagement	4.56	2.23	-0.43	-0.19
Self-efficacy	4.30	1.49	-0.51	-0.07

When it comes to the qualitative data, they revealed that feelings of self-efficacy and female managers' work engagement were highly related with care and emotional support from family, as a dominant source of a help. Two main topics related to family support came out from the content analysis - the one related to the importance of emotional support (e.g. encouragement, implicit understanding of work obligations), and the other to practical support (e.g. help and care for children, financial support).

"*My family knows what I'm going through, and that's why they understand when I'm silent*." (Female, 41 years old)

The major help for female managers is actually provided by their mothers, which in fact brings back household work again to women's domain. Self-efficacy is viewed as a highly desirable source of self-reliance, and as a socially valued means of protecting their family from becoming further dependent on them.

"Family can make things really difficult for us, which is why understanding is so important." (Female, 51 years old)

Discussion and Conclusion

Our findings indicate that family support strengthens women's belief in their own abilities, which then increases their work engagement. A possible explanation could be that such support reduces stress-related negative emotions that would otherwise undermine self-efficacy. Individuals experiencing stress may interpret negative affect and heightened arousal as signs of personal inadequacy, but supportive family attitudes can alleviate these kinds of feelings (Schwarzer & Knoll, 2007).

Understanding how positive family attitudes toward work could essentially contribute to female managers' work engagement could be a caution light for work psychologists, HR managers, and policy makers in crafting the interventions for encouraging female leaders' career sustainability and success. Even though women are less represented in managerial roles, especially in Serbia, and difficult to sample, future research might involve a larger sample and longitudinal design.

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General Cognitive Ability and Epistemic Style Show Differential Associations with Multidimensional Religiosity

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Abstract

Previous research suggests a small negative link between general cognitive ability (GCA) and religiosity, with epistemic style (ES) proposed as a mediator. However, studies rarely examine multiple dimensions of religiosity. This study explored how different aspects of religiosity relate to GCA and ES (default/automatic vs. recursive/intellective) in a sample of 274 young people from the Republic of Srpska (Bosnia and Herzegovina). GCA was assessed using ICAR Progressive Matrices, epistemic style through self-report items regarding decision-making and belief patterns, and multidimensional religiosity through subscales covering ontological, intrinsic, institutional, dogmatic, affiliative, anxious-obsessive, universalistic, fundamentalist, critical, and transcendental aspects. We observed expected correlations between general religiosity and cognitive variables, but significant differential effects across religious dimensions. Correlations with GCA and ES ranged from negligible for critical and universalistic religiosity to moderate for fundamentalist, dogmatic, anxious-obsessive, and affiliative religiosity. We found evidence for partial mediation in six religiosity scales, providing some support to dual-process models of religious cognition.

Keywords: general cognitive ability; multidimensional religiosity; epistemic style; religious cognition; youth.

Introduction

The relationship between general cognitive ability (GCA) and religiosity has attracted sustained interest, with recent meta-analyses establishing a weak negative correlation between constructs, with parameters likely between -.20 and -.12 (Dürlinger & Pietschnig, 2022; Zuckerman et al., 2020). However, these analyses showed exceptionally high heterogeneity across studies (I^2 > 90%), indicating substantial moderation. One potential moderator is the treatment of religiosity as a monolithic construct, despite its varied emotional, social, and cognitive functions (e.g., Beit-Hallahmi, 2017; De Steno, 2021). Furthermore, a prominent explanation—that cognitive/epistemic style mediates the GCA-religiosity link—has been challenged because its classic measure (Cognitive Reflection Test, Frederick, 2005) may be conceptually redundant with GCA itself (Sobkow et al., 2022; Welsh, 2022).

Therefore, the present study has three goals. First, we seek to replicate the GCA-religiosity correlation in a previously unexamined population: Orthodox Christians in Bosnia and Herzegovina. Second, we assess the differential associations between GCA and various dimensions of religiosity using a newly developed measure. Finally, we test the mediating role of cognitive style (proposed in Zuckerman et al., 2020) using a new self-report instrument, thereby addressing the key methodological confound that has complicated previous findings.

Method

Participants

Participants were recruited from high school and university students in Banja Luka (Republic of Srpska, Bosnia and Herzegovina) in May 2024. Data collection involved anonymous paper-and-pencil batteries completed in group settings. The final sample comprised 274 valid responses. Age ranged from 17 to 29 (M = 19.9, SD = 2.2, Mdn = 20.0). The sample was predominantly female (75.8%), with 92.9% self-identifying as Orthodox Christian.

Measures

General Cognitive Ability (GCA) was measured using a 15-item short form of the ICAR Progressive Matrices (Condon & Revelle, 2014), designed to assess the general factor of intelligence. This version demonstrated adequate internal consistency (α = .82, ω = .82).

Epistemic style (ES) was assessed using three custom items capturing different facets of a bipolar dimension, ranging from recursive/intellective (analytic) to default/automatic (intuitive) epistemic style (higher

scores). The facets were: 1) analytical vs. instinctive decision-making ("*When making important decisions, I primarily rely on instincts.*"); 2) valuing belief adaptivity vs. belief stability ("*Changing your mind about something that was important to you is a sign of weakness.*"); and 3) epistemic relativism vs. epistemic absolutism ("*Truth is black and white, and those who say that truth is somewhere in between just want to blur values.*"). Due to conceptual breadth, internal consistency was relatively low (α = .65, ω = .66), though factor analysis corroborated unidimensional structure with the first component accounting for 48.9% of variance.

Religiosity was assessed as *general religiosity* (single item: "To what extent are you religious?") and *multidimensional religiosity* (MdRlg) using 36 items across 10 subscales (ωs = .66-.94) covering different aspects (Table 1). Items were drawn from established scales (PCB, Hutsebaut, 1996; CROI, Krauss & Hood, 2013; AU-ROS, Gorsuch & Venable, 1983) and adapted in our previous study (Lakić et al, 2024). Responses used five-point scales from "*Not at all*" to "*Absolutely*".

Table 1: Dimensions of religiosity with example items.

Dimension (# of items and ω)	Example items
Ontological (3, .94)	I believe that personality continues spiritual life after physical death.
Intrinsic (3, .86)	I like to read religious texts.
Institutional (3, .75)	Religious institutions and places of worship (churches, mosques) are necessary for a person to find God.
Dogmatic (1)	There is only one correct answer to every important religious question.
Affiliative (2, .73)	I feel strong and powerful if I am surrounded by members of my faith during worship.
Anxious-obsessive (4, .81)	I fear that God might punish me or my loved ones if I do something wrong during worship rituals.
Universalistic (3, .66)	I would like to attend religious ceremonies of other religions.
Fundamentalist (4, .88)	Life has meaning only if you are a believer.
Critical (4, .68)	I think a lot about how God/divine being acts and why.
Transcendental experiences (3, .89)	I have experienced a sense of unity between myself and God/divine being.

Results

The majority of participants described themselves as moderately religious (45.2%), while 39.1% characterized themselves as very or extremely religious, compared to 15.7% who considered themselves slightly or not at all religious. Despite brevity of scales and mildly asymmetric distributions with skewness up to 0.50 -- which prompted use of Spearman rank correlation (see De Winter et al., 2016) -- scores on self-reported epistemic style and GCA were sufficiently variable to provide reasonable population correlation estimates. The obtained correlation between general religiosity and GCA was within the expected range, r_s = -.13, 95% CI [-.25, -.02], nearly identical to Dürlinger and Pietschnig's (2022) parameter estimate. Additionally, a positive association of similar magnitude was observed between general religiosity and default ES, r_s = .15, 95% CI [.04, .27], plus a moderate negative correlation between GCA and default ES, r_s = -.32, 95% CI [-.42, -.21].

Figure 1 shows differential associations of religiosity dimensions with GCA and default epistemic style. Based on correlation magnitudes, religiosity dimensions divided into four groups. The first group, characterized by moderately strong negative correlations includes anxious-obsessive, fundamentalist, dogmatic, and affiliative religiosity. The second group comprises ontological and institutional dimensions, with correlations just above -.20. The third group contains intrinsic and transcendental-experiential religiosity, yielding correlations comparable to that of general religiosity. Finally, the fourth group includes universalistic and critical religiosity, with practically zero correlations.

Figure 2 shows results where ES served as partial statistical mediator between GCA and general religiosity. Although results closely resemble Zuckerman et al. (2020, p.8, Figure 4), the model's explanatory power is modest given weak ES-religiosity association. Nevertheless, for six of ten dimensions with initially higher GCA and ES correlations, we observed significant indirect GCA → ES → religiosity effects (Figure 3).

Discussion

We replicated meta-analytic findings of mild negative GCA-religiosity correlation in a previously unexplored cultural context. Results suggest different religiosity dimensions serve as important moderators, where associations increase for dimensions contributing to religious authoritarianism (Lakić et al., 2024). We also replicated epistemic style's potential mediating role, whereby individuals with reduced intellectual ability may rely more on automatic processes and defer particularly to dogmatic, fundamentalistic, anxious-obsessive, and affiliative religious attitudes.

Our findings confirm the importance of multidimensional religiosity research. However, we acknowledge limitations: gender-imbalanced sample of young adults from single denomination, which requires replication across diverse cultures and age groups. Additionally, the mediation model may involve bidirectional relationships which cross-sectional designs cannot resolve (also noted by Zuckerman et al., 2020). Future research could employ experimental manipulations by priming cognitive styles to identify functional mechanisms underlying these relationships.

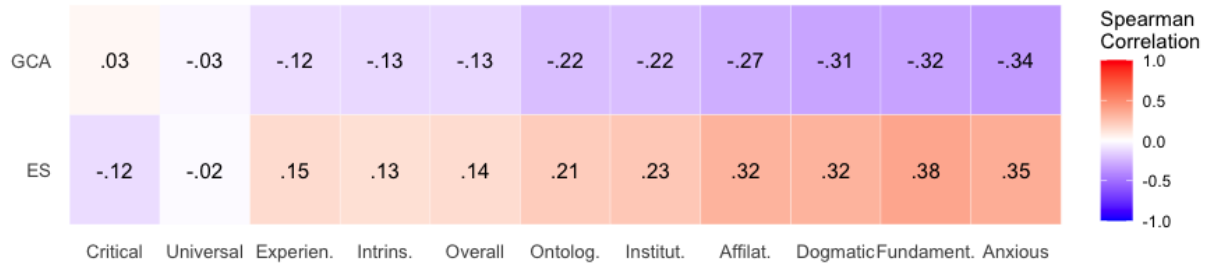


Figure 1: Correlations of religiosity dimensions with GCA and ES.

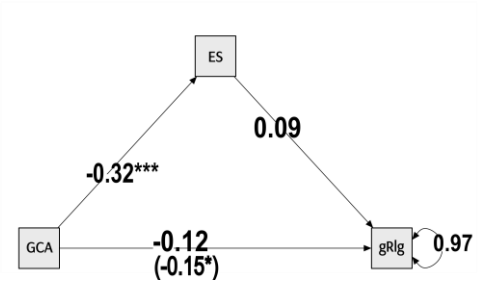


Figure 2: Mediation model with general religiosity as outcome.

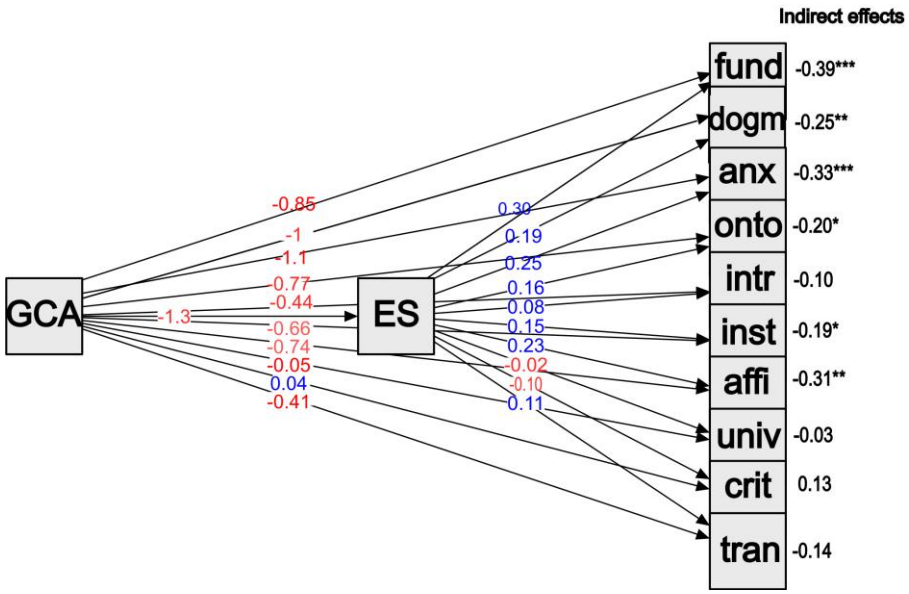


Figure 3: Mediation model with multidimensional religiosity as outcome.

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Gender (Non)Conformity and Helping Behaviour*

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Abstract

Studies have addressed the relationship between gender and helping behavior, but few of them have examined how gender norm conformity affects such behavior. Gender nonconformity is defined as an absence of conformity to gender-based societal proscriptions regarding appearance, feelings, or behaviors. This naturalistic observation study investigated whether perceived gender (non)conformity influences helping behavior and the pleasantness of social interaction. In a public setting, four individuals — two women and two men with pre-tested feminine and masculine appearances — asked bystanders for assistance. The results indicated no significant difference in helping behavior depending on the gender of the helper. However, participants provided more help to gender-conforming than gender nonconforming actor-collaborators. A significant interaction was also observed, which indicated that the frequency of helping behavior was higher among female than among male actor-collaborators, but only if they appeared more feminine. Regarding the pleasantness of social interaction, there were no significant differences either depending on the gender or the (non)conformity of the actor-collaborators. Overall, our findings offer novel insights into the dynamics of subtle discrimination and how gender expressions can shape our everyday social exchange.

Keywords: gender; gender nonconformity; helping behavior; naturalistic observation

Introduction

Numerous studies on prosocial and helping behavior have shown significant differences between men and women, both in providing and receiving help (e.g., Andreoni & Vesterlund, 2001; Nielson et al., 2017). However, interpretation of these differences is most often based on heteronormative gender stereotypes (Eagly & Crowley, 1984; Nielson et al., 2017). It remains unclear how helping behavior is manifested when the individual does not conform to such traditional roles.

Gender nonconformity refers to the extent to which individuals deviate from traditional gender norms regarding appearance, feelings, or behaviors (Martin-Storey, 2016). Many studies have found that gender-nonconforming individuals are more likely to be bullied or victimized, especially during adolescence (Hu et al., 2023; Toomey et al., 2010), which leads to increased risk of negative mental health outcomes, such as depression and anxiety (Roberts et al., 2013; Rieger & Savin-Williams, 2012). Despite this, existing research on gender nonconformity has been based solely on self-report measures (Rieger & Savin-Williams, 2012; Toomey et al., 2010) and has rarely explored how the perception of (non)conformity influences everyday social interactions. To address this gap, we decided to explore how people perceive and interact with gender (non)conforming individuals in the context of helping behaviour by conducting a naturalistic observational study.

We hypothesized that women would be more likely to help and interact more pleasantly, consistent with the literature suggesting that women are more likely than men to offer help and support, due to the specificity of traditional female gender roles (Eagly & Crowley, 1986). We further anticipated that women would receive more help, as well as experience more pleasant interactions, due to the perception that femininity implies lower competence and women being seen as weaker and more in need of help (e.g., Eagly & Crowley, 1986; Fedler, 1984). Finally, with regard to gender (non)conformity, we predicted that gender-nonconforming individuals would receive less help and experience less pleasant interactions, compared to gender-conforming individuals. This expectation is based on findings that LGBTQ+ individuals are offered less help (e.g., Aksoy et al., 2023; Gordon & Meyer, 2008), who are more likely to be gender-nonconforming (Rieger, 2012), which may lead to similar perceptions and treatment to gender-nonconforming individuals.

* The research was supervised by dr Zoran Pavlović (0000-0002-9231-5100).

Method

Pre-test

To empirically test the perception of masculinity and femininity, we constructed a questionnaire, which 50 participants completed. The participants were asked to describe their view of masculinity and femininity in men and women by answering on open type of question (e.g. "*Describe how you percieve masculine/feminine woman/man.")*, and rated pictures representative of our actor-collaborators on a 7-point Likert scale based on how feminine/masculine they deemed them to be.

Observation

We conducted a structured naturalistic observation in which a gender-(non)conforming individual approaches another person and asks for help in a specific context. Based on the results of the pre-test, we selected four actor-collaborators: a masculine man and woman, and a feminine man and woman. They approached subjects with the question: "Excuse me, do you know where there is an exchange office nearby?" For the coding unit, we selected situational sampling. The sample consisted of 80 individuals, balanced by gender.

Coding scheme

Our coding scheme consisted of four variables. The first variable was gender (non)conformity with feminine women, feminine men, masculine women, and masculine men as categories. Gender of the observer was the second variable and had two categories, female and male. Our third variable, helping behavior, was evaluated by actors-collaborators and consisted of three categories: helping behavior present, not present, and undefined; the last variable, pleasantness of interaction, had pleasant, unpleasant, and neutral interaction as categories, evaluated by actors-collaborators as well.

Results

Pre-test results

As previously mentioned, we attempted to empirically test which physical characteristics were indicative of gender (non)conformity through the use of thematic analysis of qualitative data.

In regard to the perception of femininity in women, our data converged into five core themes: feminine women were expected to wear dresses and skirts; to wear makeup frequently; to have long hair; to have gentle facial features; lastly, they were expected to be of small stature and slim, however, also have prominent curves.

The structure of themes for the perception of femininity in men was similar to the perception of feminine women, with the exception that feminine men weren't expected to have prominent curves. Additionally, they were expected to be fashionable and to have no facial hair.

Likewise, masculinity in both men and women followed a similar structure. Four major themes emerged for masculine women: they were expected to have a robust physiognomy (e.g., broad shoulders, narrow hips); they were expected to have short hair, as well as sharp facial features; they were expected to wear plain clothes with disregard for aesthetics.

Masculine men were described much the same as masculine women, except for also being expected to have strong facial hair, which they maintained.

Data collected through observation

First, we calculated the intraclass correlation coefficient (ICC) to ensure observer objectivity (Table 2), ICC values ranged from .873 to .982, indicating that observations were objective.

Table 1: Intraclass Correlation Coefficient Values for Four Observed Categories.

	ICC
FW	.982
FM	.898
MW	.873
MM	.941

Note: FW - Feminine Women; FM - Feminine Men; MW - Masculine Women; MM - Masculine Men

Helping behavior (Table 3) occurred more frequently among women (77.5%) than men (67%). However, the difference in helping behavior wasn't statistically significant, $\chi^2 = 1.112$ (1, N=76), p=.292. Pleasant interactions were more frequent among women as well (Table 4), however, this difference was also not statistically significant, $\chi^2 = 2.975$ (2, N = 76), p = .226.

The data (Table 5) show a significant association between gender (non)conformity and helping behavior, $\chi^2 = 5.330$ (1, N = 76), p = .021.

In contrast, gender-conforming individuals did not experience more pleasant interactions than gender-nonconforming individuals, $\chi^2 = 1.576$ (2, N = 76), p = .455. In both categories, neutral interactions were the most frequent (50%).

Table 7 shows that helping behavior frequencies were equally distributed between women and men. This suggests no difference based on the gender of the actor-collaborator, $\chi^2 = .013$ (1, N = 76), p = .909.

This result may be explained by the interaction that emerged between the femininity of women and the gender of the actor-collaborator, in relation to helping behavior (Table 8). That is, whether helping behavior is directed at a man or a woman depends on whether the person is feminine or masculine.

Finally, Table 9 shows that pleasant interactions occurred more frequently with women (54%) than with men (28%). However, the association between these two variables is not statistically significant, $\chi^2 = 5.534$ (2, N = 37), p = .063.

Table 2: Frequency of Helping Behavior by Participant Gender.

	No HB	Yes HB	Total
Women	9 (22.5%)	31 (77.5%)	40
Men	12 (33%)	24 (67%)	36
Total	21	55	76

Note: HB- Helping Behaviour

Table 3: Frequency of Pleasant Interactions by Participant Gender.

	Unpleasant	Pleasant	Neutral	Total
Women	3 (7.5%)	20 (50%)	17 (42.5%)	40
Men	4 (11%)	11 (31%)	21 (58%)	36
Total	7	31	38	76

Table 4: Frequency of Helping Behavior by Gender (Non)Conformity.

	No HB	Yes HB	Total
GC	6 (16%)	32 (84%)	38
GNC	15 (39.5%)	23 (60.5%)	38
Total	21	55	76

Note: HB- Helping Behaviour; GC - Gender-conforming; GNC - Gender-nonconforming

Table 5: Frequency of Pleasant Interaction by Gender (Non)Conformity.

	Unpleasant	Pleasant	Neutral	Total
GC	2 (5%)	17 (45%)	19 (50%)	38
GNC	5 (13%)	14 (37%)	19 (50%)	38
Total	7	31	38	76

Note: GC - Gender-conforming; GNC - Gender-nonconforming

Table 6: Frequency of Helping Behavior by Actor-Collaborator Gender.

	No HB	Yes HB	Total
Women	10 (27%)	27 (73%)	37
Men	11 (28%)	28 (72%)	39
Total	21	55	76

Note: HB- Helping Behaviour

Table 7: Frequency of Helping Behavior by Actor-Collaborator Gender and Gender (Non)Conformity.

	Women		Men		Total
	FW	MW	MM	FM	
No HB	2 (10.5%)	8 (44%)	4 (21%)	7 (35%)	21
Yes HB	17 (89.5%)	10 (56%)	15 (79%)	13 (65%)	55
Total	19	18	19	20	76

Note: HB- Helping Behaviour; FW - Feminine Women; MW - Masculine Women; MM - Masculine Men; FM - Feminine Men

Table 8: Frequency of Pleasant Interactions by Actor-Collaborator Gender.

	Unpleasant	Pleasant	Neutral	Total
Women	2 (5%)	20 (54%)	15 (41%)	37
Men	5 (13%)	11 (28%)	23 (59%)	39
Total	7	31	38	76

Discussion

The most alarming finding in our research was the significant disproportion of instances where subjects were unwilling to help gender-nonconforming individuals, as opposed to gender-conforming individuals. The general unwillingness to help a gender-nonconforming person has wide-scale implications on the treatment of these persons in society. This pattern of discrimination has been recognized in the work of Dovidio et al. (2017) as *subtle discrimination*, a socially acceptable alternative to overt forms of discrimination, which serves to maintain the status quo, wherein the majority group is dominant over the minority group.

Interestingly, there was no significant difference in the pleasantness of the interaction between gender-conforming and gender-nonconforming actor-collaborators. We believe that this may be interpreted in light of subtle discrimination, as our sample situation could generally be regarded as a low-risk, short interaction, which in response could not warrant any overtly unpleasant treatment, as this would be seen as unnecessarily aggressive and therefore regarded as socially unacceptable. This threshold of unnecessary involvement may have also limited the amount of explicitly pleasant interactions. This was useful for understanding the limitations of our sample situation, as a self-report measure of perceived pleasantness could have been more reliable, as well as a longer, more engaging sample situation.

Lastly, the finding that shows a significant interaction between gender and masculinity/femininity implies that people are generally more willing to help a woman who is perceived as feminine. This was per the results of our thematic analysis, as it was shown that people generally tend to perceive femininity and masculinity indiscriminately, which would imply that in the group of women, feminine women were seen as less capable and in greater need of help.

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Debiasing Pseudoscientific Beliefs

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Abstract

The widespread nature of irrational beliefs (i.e., beliefs about the world that defy the postulates of normative logic) coupled with their detrimental consequences, calls for urgent development of interventions that could reduce them. One method is the debiasing training, which provides participants with correct responses and explanations for common cognitive biases, focused on enhancing analytical thinking. However, evidence supporting its effectiveness in reducing irrational beliefs remains limited. The current study aimed to explore whether pseudoscientific beliefs could be reduced through debiasing training. To test this, we conducted a study using debiasing training. Participants completed three bias tasks, followed by correct answers and explanations of the respective biases. Results showed a significant effect on CRT performance, but in an unexpected direction—the experimental group scored lower than the control group, indicating a decline in analytical thinking. This effect did not generalize to pseudoscientific beliefs. The unexpected decrease in correct CRT scores following debiasing training calls into question the effectiveness of this strategy for analytical thinking enhancement and highlights the need for further refinement of interventions aimed at promoting analytical thinking if they are to lead to the reduction of the endorsement of irrational beliefs.

Keywords: debiasing training; analytical thinking; pseudoscientific beliefs; reduction of irrational beliefs; irrational beliefs

Introduction

Irrational beliefs, also referred to as epistemically suspect (Pennycook et al., 2015) or unwarranted beliefs (Lobato et al., 2014) represent a broad class of beliefs that lack an empirical base or defy the principles of normative logic (Teovanović et al., 2024). Research suggests that these beliefs can be classified into three groups based on their content - conspiratorial, paranormal, and pseudoscientific beliefs (Rizeq et al., 2020).

While unsubstantiated, these beliefs are still widespread and have been shown to influence real-world decision-making. Empirical research has linked irrational beliefs with a range of negative outcomes, both on the individual and societal levels. These include harmful health behaviors, political (dis)engagement, and reduced democratic participation (e.g., Taschner et al., 2021; Jolley et al., 2022).

Such alarming evidence calls for the development of methods that could reduce irrational beliefs. Reflective thinking has been repeatedly found to be negatively related to irrational beliefs (e.g., Newton et al., 2023; Svedholm & Lindeman, 2013). In line with this, studies have explored whether eliciting analytical thinking through various interventions can be an effective strategy to reduce such beliefs. In previous research, some intervention methods, such as priming, were successful and looked promising (O'Mahony et al., 2023; Swami et al, 2014), such effects were not replicated (Većalkov et al., 2024).

This is why there have been attempts to find reliable interventions to elicit analytical thinking. One promising avenue is debiasing, which relies on the explanation of common biases and how they work (Isler et al., 2020). This method has been validated in both laboratory settings (Yilmaz et al., 2017) and real-world contexts (Sellier et al., 2019).

Not only has the debiasing training proven useful for inducing analytical thinking, but some recent findings suggest that it might be successful for reducing irrational beliefs as well (Tosyali & Aktas, 2021; Bayrak et al., 2025). However, debiasing has not yet been tested on pseudoscientific beliefs. Pseudoscience refers to ideas or processes that fall outside the bounds of legitimate science, yet are presented as if they were scientifically grounded. Typically, it relies on deficient methodologies, lacks empirical support, and diverges from established scientific principles (Fasce & Picó, 2019). Given the interrelatedness of irrational beliefs (e.g., Rizeq et al., 2020; Lazarević et al., 2023) and the similar superficial information processing that underlies all of them (Majima, 2015), in this study, we will explore whether debiasing can also reduce pseudoscientific beliefs.

Aims and hypotheses

This study aimed to examine whether debiasing training can reduce the endorsement of pseudoscientific beliefs by enhancing analytical thinking.

Based on previous research demonstrating the effectiveness of debiasing interventions in reducing

irrational beliefs (e.g., Tosyali & Aktas, 2021; Bayrak et al., 2025), we hypothesized that participants who go through debiasing training would demonstrate higher levels of analytical thinking and, consequently, lower endorsement of pseudoscientific beliefs, compared to the control group.

Method

Design

We relied on a simple between-subjects experimental study with one experimental and one control group. We used debiasing training as the experimental manipulation. Participants answered three cognitive bias tasks. After providing the answers, the participants are shown what the correct answer is and are given an explanation on how the biases usually work (i.e., what the biased answer is and why it is not correct). The control group did not receive any intervention.

Measures

Cognitive bias tasks. To assess shallow semantic processing, the Semantic Illusion Task presented participants with distorted general knowledge questions, such as "How many animals did Moses take on the Ark?" and recorded their inability to recognize the abnormality. In the Base-Rate Neglect Task, participants were asked to select between options based on either individuating descriptions or base-rate probabilities; bias was shown by the disregard of base-rate information. The Availability Heuristic Task assessed the use of mental availability revealed heuristic-driven reasoning in the form of a systematic overestimation of occurrences that were easily remembered. These three tasks were part of the debiasing training procedure and were not analyzed as outcome measures.

Pseudoscientific beliefs. To assess the tendency to endorse pseudoscientific beliefs, we used the Endorsement of Pseudoscientific Beliefs Scale - Revised (PSEUDO-R; Fasce et al., 2021), which consists of 19 items (2 negatively reflected) answered on a 5-point Likert scale.

Manipulation check. In order to see if there was any effect of the debiasing training manipulation, we used the Cognitive Reflection Task (CRT; Damnjanović et al., 2019) with 8 open-ended questions. Responses were coded into three types: (mathematically) correct, heuristic (typical error), and atypical (random answer).

The sample consisted of a total of N = 336 participants who were randomly assigned to either the experimental or control group. The questionnaire was administered online on social media through the SoSci survey platform.

Results

To examine if the debiasing technique elicited analytical thinking, we first examined the differences in correct CRT scores between the two groups. ANOVA results (Table 1) indicated a significant difference in debiasing on correct CRT scores ($F(1, 334) = 9.35$, $p < .01$, $\eta^2 = .027$). However, the experimental group demonstrated lower CRT scores compared to the control group, suggesting a decrease in analytical thinking following the intervention. To disentangle why the effect was in the opposite direction than we expected, we also checked whether there were significant differences between the groups in intuitive (typical errors) and random answers CRT scores as well. We found no significant differences (Table 2) in intuitive scores ($F(1,334) = .55$, $p < .01$), but there were differences in random scores, so that the experimental group had significantly higher scores ($F(1,334) = 17.93$, $p < .001$). To check H1, we ran another ANOVA examining the differences between the two groups in pseudoscientific beliefs, but found them to be non-significant ($F(1,334) = .11$, $p < .01$).

Table 1: ANOVA results on CRT scores

Measure	Group	M	Sd	F (1, 334)
CRT	Control	4.29	2.27	
	Experimental	3.54	2.23	9.35*
CRTint	Control	1.98	1.69	
	Experimental	2.11	1.68	0.55
CRTran	Control	1.88	1.34	
	Experimental	2.55	1.53	17.93**

*Note. * p<.01, ** p < .001*
CRTint - intuitive (heuristic/typical error) answers
CRTran - random/atypical answers.

Table 2: ANOVA results on Pseudoscientific Beliefs (PS)

Measure	Group	M	Sd	F (1, 334)
PS	Control	2.94	0.64	
	Experimental	2.97	0.62	0.11

Discussion

While previous research suggested this intervention is successful in lowering the endorsement of irrational beliefs (Tosyali & Aktas, 2021), we found no evidence that debiasing significantly lowers pseudoscientific beliefs. We also did not find evidence that debiasing elicits analytical thinking - our results imply a decrease in deliberate cognitive engagement following the intervention rather than a shift toward more reflective reasoning. One of the reasons why the intervention failed to produce the expected results is the format of the CRT tasks our participants completed. While other studies relied on a closed-ended format of responses for CRT (van Velzen & Većalkov, 2023), we left the responses open-ended. However, it should be noted that this brings about the question of the robustness of the debiasing effect if a mere change in response format leads to its reversal.

Researchers have also raised the question of whether one training session is sufficient to induce rational reasoning (Correia, 2016). This consideration may also

explain the surprising findings observed in our study and proposes that multiple training sessions may be necessary to produce more robust effects.

While debiasing could still be a promising approach for lowering irrational beliefs, our findings suggest that its effects are significantly more context-dependent than previously assumed. Our results highlight the need for replication studies, as well as an examination of different factors (e.g., response format, individual differences such as thinking styles, etc.) that could influence the effect of these interventions. Moreover, our findings further suggest the need to examine a variety of different interventions to tackle irrational beliefs that are not limited to those that target the superficial information processing style.

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Socio-Politically Conscious Individuals' Understanding of the Interplay Between Ideology and Obstetric Violence

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Abstract

Obstetric violence is a prominent form of violence in Serbian healthcare settings, exemplifying the politicization of the body, where ideology and traumatic experiences intertwine. The aim of our paper was to explore this interdependence of inner processes and ideological structures. We therefore applied the framework of the Möbius strip model to explore how socio-politically conscious individuals understand the interplay of ideology, practice, and victims' experience in the context of obstetric violence. We purposely sampled 11 young adults (7 male; aged 26-34) based on the following criteria: they were either members of a political organization or had an academic interest in politics; they were familiar with obstetric violence but had no personal experience with it. We conducted semi-structured, in-depth interviews and analyzed their responses using thematic analysis. Results are organized into three broad themes – *Hegemony of Ideology*, *Paradoxes of Ideology* and *Lack of Ideology*. Our participants recognize the relationship between ideology and the experience of obstetric violence. However, they predominantly focus on one side of the Möbius strip. Namely, they identify important narratives that perpetuate violence, at the same time failing to reflect on how these narratives interact with women's subjective experiences.

Keywords: obstetric violence; ideology; Möbius strip; socio-political consciousness

Introduction

Obstetric violence is a major healthcare issue in Serbia, with mistreatment ranging from verbal abuse and unnecessary interventions to neglect and physical violence (Janković, 2024; Stanković, 2017). It constitutes a form of structural violence against women (Sadler et al., 2016) and exemplifies the politicization of the body, where ideology shapes practices and subjective experiences (Foucault, 1982). However, the ideological narratives sustaining such violence, and their dynamic with concrete experience, remain underexplored. We targeted two groups of socio-politically conscious individuals that play an important role in shaping and challenging public narratives, to explore how ideological structures interact with subjective experiences. The Möbius strip model (Grosz, 1994; Lacan, 1977), used in feminist theory to conceptualize phenomena of subjectivity, was applied to frame the hypothesized reciprocal interrelation of bodily, psychological, and social dimensions in the experience of violence.

Methodology

Participants and procedure

We employed a qualitative approach, conducting 11 semi-structured in-depth interviews with young adults (7 male, 26–34 years, Mdn=32). Selection criteria included political organization membership or academic interest in politics, to capture a broader spectrum of political awareness. All participants were informed about obstetric violence, but had no personal experience. Using purposive sampling, we recruited participants through the snowball method. The gender imbalance reflects the demographics of the chosen political and academic organizations. Relying on the Möbius strip model, interviews explored: (1) dominant narratives around obstetric violence, (2) their influence on subjective experience, and (3) the reciprocal impact of experience on ideology. Interviews lasted ~50 minutes, were conducted in summer 2024, and were recorded and transcribed.

Data analysis

We used reflexive thematic analysis as an analytic framework (Braun & Clarke, 2021) with MAXQDA 24 software for coding. With no pre-existing coding frame, patterns were identified inductively ('bottom-up'). Three researchers coded transcripts independently and, through discussion, reached consensus on a unified hierarchical scheme by grouping initial codes into higher-order ones, ensuring reliability through high agreement. The first step in analysis was mainly descriptive, with interpretative elements attending to participant meaning. In the second step, major themes were interpreted in light of the Möbius strip model.

Findings

We identified three broad themes – *Hegemony*, *Paradoxes*, and *Lack of Ideology*, each capturing a distinct aspect of the relationship between ideology and subjective experience.

Hegemony of Ideology was the most prevalent theme, capturing narratives that shape practices and subjective experiences. It encompasses four subthemes with varying frequency**.** ***Dehumanisation in Capitalism*** was discussed by most participants, who stressed that healthcare institutions reflect a *capitalist logic* that prioritizes profit over care. Participants additionally focused on patriarchal narratives, describing how women are reduced to means of reproducing the workforce. "*I think violence is connected to the fact that within the context of capitalist reproduction, the woman is degraded and her role reduced solely to reproducing the workforce.*" *(Vlada 34).* ***Hyperindividualism*** was frequently noted: solidarity is undermined, attention redirected to achievement over care, and responsibility shifted to the individual, often resulting in victim-blaming. "*Everyone rushes to say, 'No, the woman is to blame, if only she knew how to give birth properly, if she had pushed the right way'". (Jelena, 34).* While the theme ***Medicine in Capitalism*** appeared among most participants, women provided more detailed elaborations, highlighting that medical culture imposes control and discipline over childbirth through technology and expert authority. Excessive medicalization, pathologization, and unnecessary interventions prioritize efficiency, reinforce passivation, and normalize violence. "*Obstetric violence results from prioritizing technological surveillance and institutional routinization. This dehumanizing process has made violence so normalized that it goes unnoticed.*" *(Đurđa, 34)* Last, a few participants identified ***Transition and its Phenomena***, pointing to the shift from socialism to neoliberalism as a catalyst for the degradation of public healthcare, noting that access to quality care now largely depends on income, leaving low-income patients at greater risk of poor treatment. "*Access to a safe childbirth now depends on the depth of one's pocket. " (Jelena, 34).*

Paradoxes of Ideology is a theme that was less frequently mentioned, but still notable among the interviews. It explores the internal contradictions within the ideological framework and how these inconsistencies affect obstetric experiences. The first subtheme, ***Paradox of Scientific Development***, was discussed by several participants and shows that despite science progress, quality care remains a privilege under neoliberalism. Although the system is capable of offering higher standards, most women still give birth in degrading conditions. "*It's absurd that 40 years ago, when the available technology was much worse, the quality of care was still better and more accessible to everyone.*" *(Mihajlo, 27).* The other subtheme, ***Paradox of Patriarchal Capitalism***, was discussed primarily by female participants, who seemed to better recognize the ideological contradictions women face. While motherhood is idealized, women are reduced to reproductive machines, resulting in emotional disorientation. "*Maternity wards are supposed to be places where women, those 'disgusting cows' are becoming mothers to 'precious little Serbs'. There's intense doublethink going on.*" *(Nina, 32).*

Lack of Ideology is the least prevalent theme that addresses instances of violence where no direct ideological mediation is present. **Raw reality of violence**, elaborated by a few participants, highlights the moments when violence is so intense that it evades emotional or symbolic processing. Later, the experience may be rationalized through ideology, or remain unintegrated. "*There isn't much room to rationalize the experience through ideology when you believe you might not survive or that your child won't make it.*" *(Vlada, 34).* Two participants elaborated on ***Unmediated Sadism***, referring to the idea of brutal violence stemming from the psychopathology of the doctor rather than being ideologically driven. "*Maybe the guy has certain traits, and now they've just surfaced, come to light.*" *(Mina, 29).*

Discussion and Conclusion

This study identified ideological narratives potentially important for perpetuating obstetric violence in Serbia, highlighting the role of dehumanizing, patriarchal, and individualistic ideas central to capitalism. It also explored the ways socio-politically conscious individuals relate ideology to concrete experience when discussing obstetric violence. This population recognized the interaction between ideological narratives and personal experience. However, their explanations mostly remained within the ideological domain, focusing on the analysis of discursive aspects rather than on *how* narratives shape subjective experience. In other words, their reflections remained on the "ideological" side of the Möbius strip. This notable distance from concrete experience may result from the sample's composition: more male participants, biases stemming from epistemological positions, and the impact of the patriarchal socio-cultural context. The model's bi-directionality was not reflected in the empirical material – participants did not consider the role of subjective experience in the reciprocal constitution of the discursive reality. Further research is necessary with a more diverse sample, ideally subjects with personal experiences of obstetric violence, to explore the neglected direction and to evaluate whether the model can adequately capture the complexity of this relationship.

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The Prototype of an Ideal Woman in Titles of Pornographic Films*

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Abstract

The online porn industry is one of the highest growing industries, capturing about a 100 million people visiting online sites. The portrayal of women in this content has great importance, as it shapes men's beliefs about women in general. The aim of this research was to examine how women are represented in the titles of pornographic films. The prototype of an ideal woman was analyzed through four concepts: objectification, agency, role and physical attractiveness. We expected women to be objectified (visible in frequent references to body parts), presented with low agency (as an object), described as physically attractive (young and with oversized sexual body parts) and in numerous and specific roles. The method used in this research was quantitative content analysis. Contrary to our expectations, the analysis showed that in the majority of titles women were not objectified, they were more frequently shown with higher agency, and more mature; the differences in references to oversized sexual body parts were inconclusive. Women were more often assigned roles than not (most popular roles were "family" roles). Our results deviate from those in earlier research which suggests that language descriptors probably serve specific communication functions in creating narratives about women. Further research of visual cues (e.g. thumbnails) is needed.

Keywords: pornography; content analysis; objectification; ideal woman; agency

Introduction

The online pornography industry represents one of the fastest-growing sectors in the digital marketplace, attracting an estimated 100 million users daily. Given the ubiquity and ease of access to such content, the representation of women within pornographic media warrants critical examination, as it significantly contributes to the formation of male viewers' perceptions and beliefs about women more broadly. These portrayals often function not merely as entertainment, but as influential cultural narratives that shape understandings of gender, sexuality, and power relations. The aim of this research was to explore the representation of women in pornographic video titles through four key concepts: objectification, agency, role, and physical attractiveness.

Objectification is defined as a phenomenon where "a woman's body, body parts, or sexual functions are separated from her personality, reduced to the status of an instrument, or treated as if they represent her as a whole" (Fredrickson & Roberts, 1997, p. 175) and some earlier research delves into analyzing video material in this sense (Fritz & Paul, 2017; Klaasen & Peter, 2014; Zhou & Paul, 2016). Some studies have examined agency in video material (Fritz & Paul, 2017; Zhou & Paul, 2016), which has been conceptualized as "the ability to initiate sexual acts and to refuse unwanted acts" (Fritz & Paul, 2017, p. 4). These studies prove women to be very lowly agentic when it comes to both initiating and refusing sexual acts.

Previous research associated attractiveness with young females (Walter et al., 2020) and with oversized sexual body parts (Marković & Bulut, 2023). Thus, we defined attractiveness through age and body part size.

Prior studies have not given significant attention to the aspect of roles that females "play", since most of them used video material as its unit of analysis. Some studies that have examined them, found females in submissive roles to be more frequent (Klaasen & Peter, 2014). However, there was not any elaboration of specific roles, thus we decided to delve more into this topic.

Based on the previous studies, we expected women in pornographic video titles to be objectified (visible in frequent references to body parts; H1), presented with low agency (as an object; H2), described as physically attractive (young and with oversized sexual body parts; H3) and in numerous and specific roles (H4).

* The research was supervised by dr Zoran Pavlović (0000-0002-9231-5100).

Method

The method used in this research was quantitative content analysis. The population of statements consisted of the most popular titles of pornographic videos on the Pornhub website over the course of one week (18.11. - 24.11.2024.). The sample was drawn from the top 206 titles in the *Most popular in Serbia* category, featuring heterosexual couples and written in English. Only those statements in which words referring to a woman appeared in were included in the analyses, which lead us to the final sample of 180 video titles. The unit of analysis was a statement representing a semantically meaningful part of the title. One title could include two or more semantically meaningful parts (exp. *heard Stepsister's dream=lost NNN challenge!!!*). Therefore, after completing the coding process, we identified 308 statements.

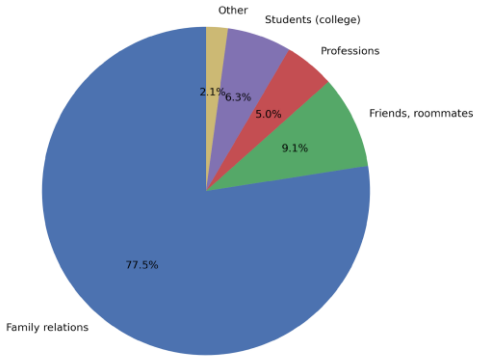
Coding scheme

In accordance with the hypotheses, we created a coding scheme containing eight variables. Variable *Actors mentioned in the statement* (1. female only, 2. male only, 3. both female and male, 4. other) was used as a selection criterion. Objectification was operationalized as a binary variable *Body part or body-related attribute* (1. mentioned, 0. not mentioned). Agency was operationalized via *The function of women in the statement* variable (1. subject, 2. object, 3. both subject and object, 4. other). Physical appearance was operationalized through three variables. Firstly, variable *Age* consisted of three categories (1. young, 2. mature, 3. other/unspecified). Secondly, the size of sexual body parts was coded into two variables - *Buttocks* and *Breasts*, both consisting of three categories (1. attributes indicating the prominence or preferred shape mentioned, 2. attributes describing this body part in other ways mentioned, 3. the body part was not mentioned). The third component was operationalized as the variable *Thinness* (1. attributes indicating thinness mentioned, 2. thinness mentioned in a different context, 3. not mentioned). The last variable *Roles* was explorative and binary (1. the woman in the statement has a specific role, 2. the woman in the statement does not have a specific role). In cases when specific roles were mentioned, they were later coded into five ad-hoc, meaningful categories (1. family relations, 2. friends, roommates, 3. various professions, 4. students, 5. other).

Results

The selected material was coded by five independent coders and agreement ranged from good to very good for all variables (κ = 0.72 - 1). In 82.5% of the statement's words referring to women appeared, and these statements were included in the subsequent stages of analysis. Attributes referring to physical characteristics did not appear in the majority of statements (χ^2 = 9.14 p < 0.01, df = 1). Women were more often presented as a subject than as an object (χ^2 = 6.92, p < 0.01, df = 1) and described as younger rather than mature (χ^2 = 8.05, p < 0.01, df=1). There was no significant difference regarding the attributes describing *Buttocks* (χ^2 = 0.89, p > 0.05, df = 1) and *Thinness* (χ^2 = 0.08, p > 0.05, df = 1). When it comes to the variable *Breasts,* the number of cases did not meet the criteria for calculating chi square coefficient. In line with our hypothesis, a significant difference was found in the frequency of statements containing specific roles (68.75%) compared to those without them (31.25%) (χ^2 = 8.00, p < 0.01, df = *1*). The women were most often pictured in roles related to different "family" relations (see Figure 1).

Figure 1: Distribution of women's specific roles in movie titles



Discussion and conclusions

Results of this study only partially confirmed our initial hypotheses. While previous research emphasized the visual objectification of women in porn (Fritz & Paul, 2017 Klaasen & Peter, 2014), we found no clear evidence of this in video titles. Caution is needed in interpreting these findings, as visual formats – like thumbnails – may be more suitable for conveying objectification than verbal ones. Our focus on verbal material may also explain why body-related descriptors were not dominant, since previous research was image-based (Marković & Bulut, 2023). Further, the agency hypothesis was not supported. Although women often appeared as grammatical subjects, they rarely initiated the act; instead, they fulfilled male needs. The age preference hypothesis was also not confirmed. This may be caused by casting practices – women labeled as "mature" often have youthful features. On the other hand, the verbal code effectively conveyed gender roles. Statements constructing the woman through specific roles were frequent, with family roles being dominant (step-sis, stepmother, milf etc.). We interpret this through the appeal of taboo topics, which likely increase viewer interest and engagement. However, future studies should therefore include thumbnail analysis for a clearer picture, bearing in mind our primary focus on verbal material.

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The Interplay of Trust in Civic Institutions and Political Self-Efficacy in Psychological Coping with Global Challenges

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Abstract

Societies around the world face a seemingly endless barrage of challenges increasing uncertainty, while trust in civic institutions (TCI) is dwindling. Although civic institutions should provide organization and stability, research shows that TCI leads to both better or worse psychological and behavioral outcomes in different societies. Another way to combat crises is through political participation, which is strongly dependent on political self-efficacy. Combining these constructs, we explored the role of political self-efficacy in the relationship between TCI, worry (related to the war in Ukraine), and psychological well-being in Slovenia. We used a representative sample from Slovenian public opinion survey 2022/2 and hypothesized that higher TCI will contribute to less worry, which, in turn, would lead to higher positive and lower negative affect. Moreover, we expected political self-efficacy to moderate these relationships. The moderated mediation model revealed that higher TCI contributed to higher worries, but less so for those high in political self-efficacy. Worries did not mediate the effect of TCI on affective outcomes. Instead, TCI was directly associated with more positive affect. The results point to the importance of political self-efficacy and civic participation in psychological coping with uncertainty related to global challenges.

Keywords: trust in civic institutions; political self-efficacy; worries; well-being; global issues

Introduction

Uncertainty linked to social challenges has become a persistent feature of everyday life. Since feelings of uncertainty reduce people's ability to anticipate future outcomes, they are linked to various negative psychological consequences – for example, lower expectations about educational outcomes among youth (Lep et al., 2025), increased mental distress (El Khoury-Malhame et al., 2024), and diminished trust in civic institutions (Gao et al. 2022). One promising approach to mitigating such negative effects is to encourage active participation (e.g., Shulz, 2024), as participation aids in better understanding of societal expectations and identification of available social resources. Fostering active participation in the civic sphere is possible through enhancing political self-efficacy (e.g., Solhaug, 2006) – the belief that one can influence political processes.

Individuals who feel more politically self-efficient also report greater trust in civic institutions (TCI) (ter Huurne & Gutteling, 2009), perhaps because they perceive the political system to be organized according to democratic norms that allow for meaningful change. TCI is generally associated with positive societal (e.g., van der Meer & Hakhverdian, 2016) and psychological outcomes, such as feelings of safety (Spadaro et al., 2020) and subjective well-being (Hudson, 2006; Lee, 2020), making its decline a cause for concern. Uncertainty, however, can undermine TCI (e.g., Gebrihet & Mwale, 2024), which is critical for effective and resilient adaptation of societies to changing conditions (Hill et al. 2023; Tong et al., 2020). Concurrently, research has documented motivated increases in TCI during periods of uncertainty – a phenomenon referred to as the *trust paradox*. In such cases, individuals may increase their TCI as a psychological coping mechanism to reduce anxiety and regain a sense of control (Shockley & Shepherd, 2016).

These motivated increases in TCI, however, can also have negative societal consequences. Elevated trust may dampen risk perception and reduce anxiety, which in turn can decrease compliance with institutionally mandated policies (e.g., Han et al., 2017). Research has also shown that anxiety can serve as a mobilizing affective response, spurring civic participation rather than merely inhibiting it (Romanova & Hutchens, 2023).

Given the established link between trust in civic institutions (TCI) and subjective well-being (i.e. positive and negative affect) (e.g., Lee, 2020), we wanted to explore how worries about uncertainty and political self-efficacy fit into this relationship. We hypothesized that the effect of TCI on positive and negative affect would be mediated by individuals' proximal worries about current societal challenges (i.e. war in Ukraine). We expected that participants with higher TCI would report lower levels of worry, which in turn would be associated with more positive and less negative affect (H1).

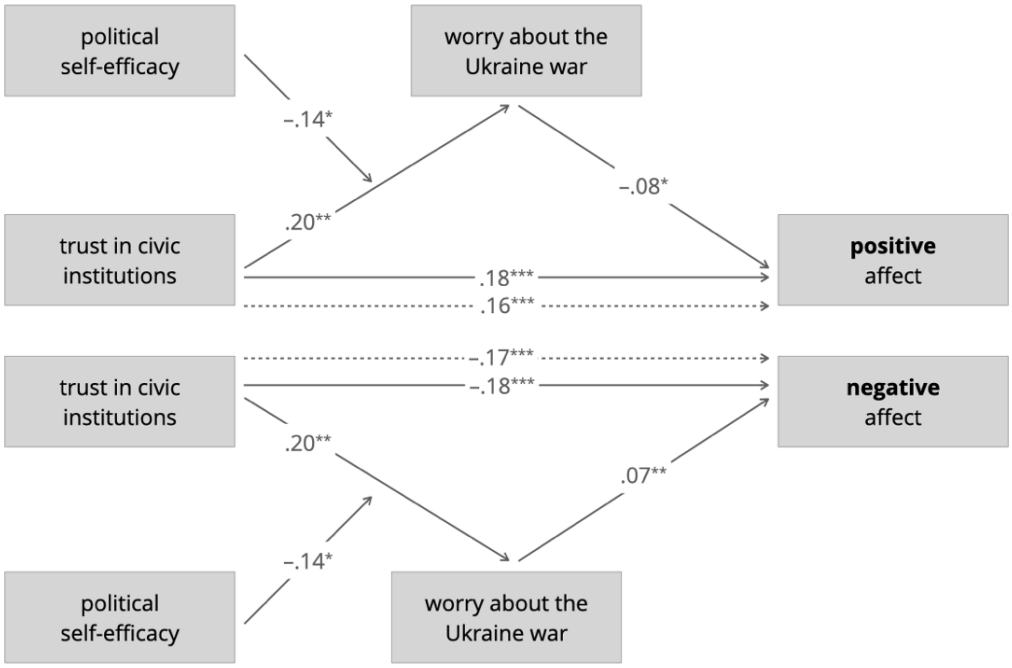


Figure 1: The results of the two moderated-mediation models exploring the relationship between TCI, worries, and positive and negative affect, moderated by political self-efficacy. $^{*}p < ,05$, $^{**}p < ,01$, $^{***}p < ,001$.

Additionally, we were interested in whether individuals' sense of political self-efficacy could buffer against the negative consequences of low TCI – such as increased worries. Political self-efficacy has been shown to be negatively associated with symptoms of depression (Bernardi et al., 2023), which suggests its potential protective role. Therefore, we expected that the relationship between TCI and worry would be moderated by political self-efficacy (H2).

Methods

Participants and procedure

We used data from the Slovenian Public Opinion survey 2022/2 (Hafner-Fink et al., 2024), which was conducted from November 2022 to January 2023 using a combination of paper and online surveys (Hafner-Fink et al., 2023). The final representative probabilistic sample consisted of 1,040 Slovenians aged 18 or older (M = 49.2, SD = 16.7, 59% female).

Measures

The survey consisted of three thematically related sets of questions. For this study, we used questions from *The Mirror of Public Opinion* (including recurring topics of the Slovenian Public Opinion survey) and the Attitudes towards immigrants and their integration. Participant's total scores for multi-item measures were calculated using a PCA-derived optimal weighted sum (varimax rotation).

Trust in civic institutions (TCI) was assessed for five civic institutions on a 11-point scale (0 – *I don't trust at all*, 10 – *I trust strongly*), with the option *I don't know*. Participants reported their trust in the government, the president, the National Assembly, the court, and the police. The scale had good internal reliability (α = .88).

Worry about the Ukraine war was assessed on a 5-point scale (1 – *not worried at all*, 5 – *very worried*), allowing participant to choose the option *I don't know*.

Political self-efficacy was assessed on a 11-point scale (0 – *not at all*, 10 – *entirely*), with the option *I don't know*. Participants were asked to what extent they feel the political system enables them to influence the political landscape at the local level.

Positive affect was assessed with the World Health Organization-Five Well-Being Index (WHO-5) containing 5 items on everyday well-being and positive emotions (e.g., *I have felt cheerful and in good spirits*). Participants provided responses on a 6-point scale (0 – *at no time*, 5 – *all of the time*), with the option *I don't know.* The scale had good internal reliability (α = .91).

Negative affect was assessed using a 5-point scale across two items. The first item measured perceived stress over the past 14 days (1 – *never*, 5 – *every day*), and the second assessed perceived self-regulatory efficacy during daily stress (1 – *easily manage*, 5 – *I don't manage, my life is unbearable*), with the option *I don't know*. The scale had sufficient internal reliability (α = .71).

Results

We tested two moderated-mediation models, one with positive affect and the other with negative affect as the outcome variable. Missing participant data (e.g., choosing

option "*I don't know"*) were handled using the full information maximum likelihood (FIML) estimation method. In both models, TCI scores predicted higher levels of worry about the war in Ukraine, which in turn differentially predicted the affective outcomes. Political self-efficacy was included as a moderator of the relationship between TCI and worries (see Figure 1).

Participants who trust the civic institutions more reported greater worry about the war in Ukraine. This relationship was moderated by political self-efficacy: the association between TCI and worry was weaker among individuals with high political self-efficacy ($\beta = .06$, $p < .001$) compared to those with low political self-efficacy ($\beta = .35$, $p < .001$). Furthermore, worry about the Ukrainian war significantly predicted positive and negative affect, even after controlling for TCI. Specifically, individuals who reported higher levels of worry experienced more negative affect and less positive affect. However, worries did not mediate the effect of TCI on either positive ($a*b = -0.02$, $p = .08$) nor negative affect ($a*b = 0.02$, $p = .07$). Instead, TCI was directly associated with affective outcomes, such that higher TCI scores were linked to both greater positive affect (well-being) and lower negative affect (perceived stress). Both models accounted for only a small proportion of variance in the outcome variables ($R_{PA}^2 = .04$, $R_{NA}^2 = .04$).

Discussion

Contrary to our expectations (H1), the results revealed a positive relationship between TCI and worries about the Ukraine war. While it is possible that this could be explained by the way these institutions communicated in the situation or by their perceived efficiency, it could also be attributed to the trust paradox. Perhaps those who were more worried increased their TCI, pointing to the limitation of cross-sectional research design.

While mere encouragement of TCI does not seem to benefit Slovenian citizens faced with global challenges in terms of reducing worries about current threats (though higher TCI contributed to improved subjective well-being in our study), we underline that strong democracies require both strong institutions and active citizens. Supporting this notion, the results of the moderated effect of political self-efficacy support our expectations (H2) and show that in those high on political self-efficacy, the relationship between TCI and worries was dampened. Nevertheless, a limitation of our cross-sectional study is that positive and negative affect were measured in general terms rather than being explicitly tied to political issues or uncertainties. This constrains both the strength of observed relationships and the ability to identify the sources of these affective states and whether they are indeed caused by worries about uncertainty.

Taken together, it might be strengthening of political self-efficacy and spurring participation that would empower people in uncertain situations and lead to better psychological coping – a proposition awaiting empirical support using more nuanced measures.

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The Prevalence of Gender-Based Violence Among Students at the University of Belgrade: Insights from the UniSAFE International Study

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Abstract

The aim of this study was to examine the prevalence of different forms of gender-based violence (GBV) among university students, as well as differences by gender and sexual orientation. The survey was conducted as part of the international UniSAFE project, which investigated the prevalence of GBV at universities across 15 European countries, including Serbia. Quantitative data were collected through an online survey administered to a sample of 2,175 students from the University of Belgrade: 76% identified as female and 24% as male; 87% identified as heterosexual and 13% as LGBT+. More than half of the students (57%) reported experiencing at least one form of GBV within their institution. The most prevalent form was psychological violence (53%), followed by physical (6%), online (5%), economic (5%), and sexual violence (2%). Women and LGBT+ students were significantly more likely to experience at least one form of GBV. Psychological violence was reported by 56% of female and 41% of male students, as well as 60% of LGBT+ and 52% of heterosexual students. Notably, 93% of students who experienced GBV did not report incidents. These findings have important practical implications: establishing institutional mechanisms for the prevention of and response to all forms of GBV in academic settings is essential.

Keywords: gender-based violence (GBV); university students; gender; sexual orientation; UniSafe international study

Introduction

The problem of gender-based violence (GBV), including sexual harassment, is not new in academic settings (Strid et al., 2021). Certain characteristics of higher education institutions, such as power asymmetries between students and academic staff, hierarchical structures within academia, and a high concentration of young people contribute to an increased risk of GBV (Jones et al., 2020). GBV can undermine students' well-being, participation, and academic performance (Bondestam & Lundqvist, 2020; Rothman et al., 2021).

Despite the significance of this issue, research on GBV among university students remains limited, both in Serbia and globally. Although GBV has long been discussed in feminist circles, it has only recently gained attention in Serbian academia after several high-profile cases at the University of Belgrade.

The survey presented in this paper was conducted as part of the international UniSAFE project – one of the largest and most comprehensive initiatives aimed at addressing GBV among students and staff in academia across Europe. The aim of this study was to examine the prevalence of various forms of GBV among university students, with particular attention to differences by gender and sexual orientation.

Definition of Gender-Based Violence

In the UniSAFE project, 'gender-based violence' (GBV) is defined as "violence directed towards a person because of their gender, or violence that affects persons of a specific gender disproportionately" (Lipinsky et al., 2022, p. 5). The term GBV is used as an umbrella concept encompassing a wide range of gender-based violations and abuses, including, but not limited to, physical, psychological, economic, financial, and sexual violence, as well as sexual and gender harassment, stalking, organisational violence, and harassment. These forms of violence can occur in both online and offline contexts and may include emerging forms that are not yet fully recognised or labelled as violence (Humbert et al., 2022; Strid et al., 2021). Importantly, GBV is not limited to violence against women; it can affect people of all genders.

GBV manifests in various and often overlapping forms. *Physical violence* involves the use of unlawful physical force that results in bodily harm, such as threats of physical harm or physical assault. *Psychological violence* refers to actions that cause emotional or mental harm, including abusive language, persistent interruptions, or dismissive behavior. *Economic violence* encompasses behaviors that restrict an individual's access to financial resources or hinder their work and studies. *Sexual violence* includes any sexual act performed without the person's consent. *Sexual harassment* includes unwanted verbal, nonverbal, or physical sexual conduct, such as inappropriate comments, sexist jokes, or unwanted touching. *Online violence* involves various forms of abuse carried out through digital platforms, including cyberbullying, non-consensual sharing of sexual images, and internet-based sexual abuse (Lipinsky et al., 2022).

Method

Sample

The UniSAFE project spans 46 universities and research-performing organisations (RPOs), with a total of 42,186 respondents (57% students and 43% staff) from 15 countries: Belgium, the Czech Republic, Finland, France,

Germany, Iceland, Ireland, Italy, Lithuania, Poland, Serbia, Spain, Sweden, Turkey, and the United Kingdom.

Sample consists of 2,175 students (aged 18 and above) from the University of Belgrade, of whom 76% identified as female and 24% as male; 87% identified as heterosexual and 13% as LGBT+ (lesbian, gay, bisexual, queer, or asexual). A total of 8% of participants chose not to disclose their sexual orientation.

Procedure

Quantitative data were collected through an online survey. A link to the self-administered survey was sent to respondents via their university email. Informed consent was obtained from all respondents at the beginning of the survey.

Given the sensitive nature of the information, all necessary measures were taken to ensure respondent anonymity and data confidentiality. The national research team received a dataset from which all variables that could directly identify respondents (e.g., faculty, main field of study, level of study) were excluded.

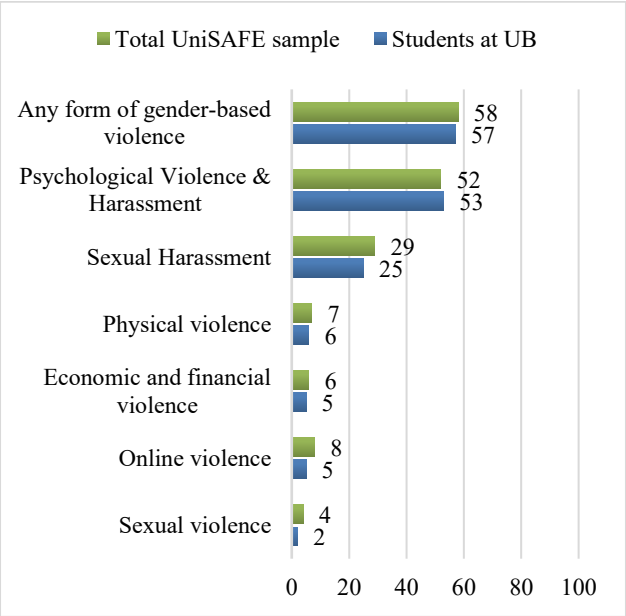
Results

Prevalence of GBV

The prevalence of GBV refers to the proportion of participants who have experienced any form of gender-based violence covered in the survey since they began studying at their institution.

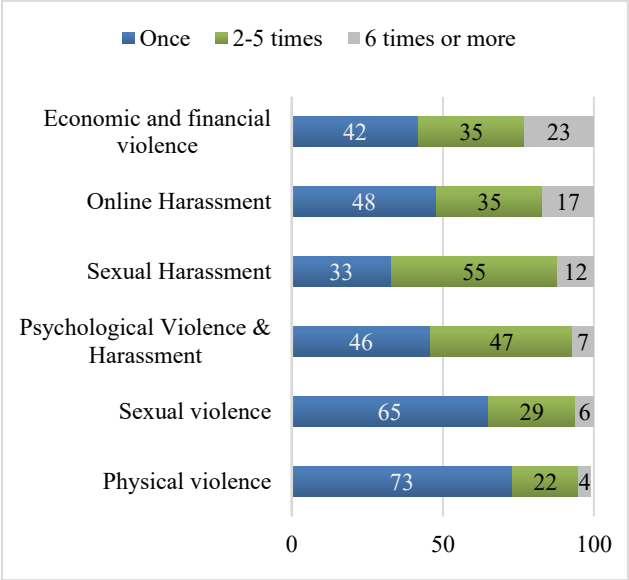
More than half (57%) of students from the University of Belgrade had experienced at least one form of GBV during their studies. The most prevalent form of GBV was psychological violence (53%), followed by sexual harassment (25%), physical violence (6%), online violence (5%), economic (5%), and sexual violence (2%) (Figure 1).

Figure 1: Prevalence of GBV overall and by forms.



The frequency of GBV varies depending on the form of violence (Figure 2). The least frequent forms of GBV are physical and sexual violence. Two-thirds of respondents experienced repeated sexual harassment. Approximately one-fifth of respondents experienced economic, financial, and online violence more than six times during their studies.

Figure 2: Frequency of GBV across different forms.



The highest percentage of respondents (31%) reported experiencing one form of GBV. Nearly one-fifth (18%) reported exposure to two forms, while 5% experienced three forms. Furthermore, 2% of respondents experienced four forms GBV, and 1% reported being exposed to five or six different forms.

Differences in Prevalence of GBV

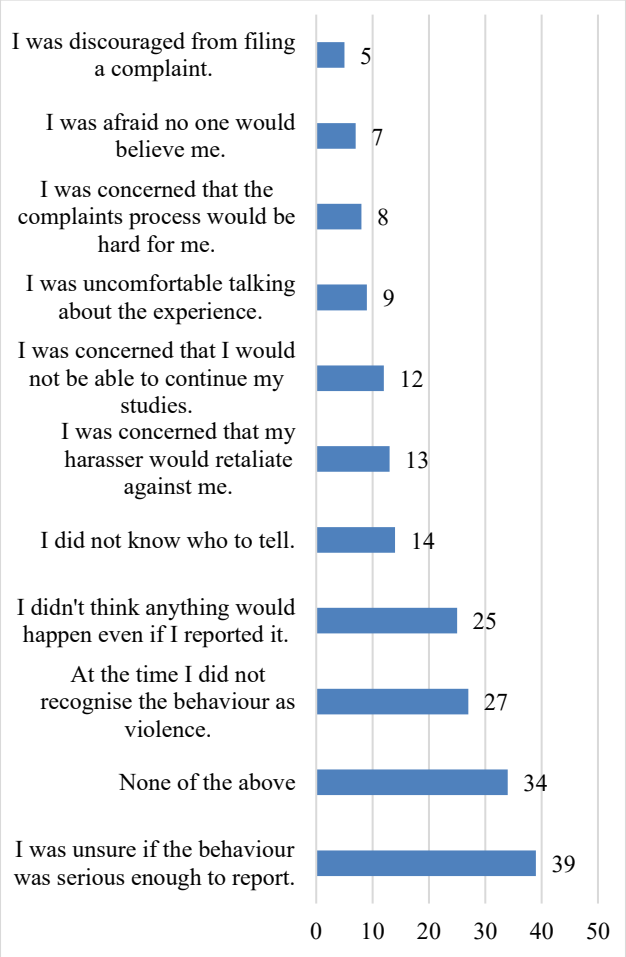
There were significant differences in the prevalence of GBV based on gender and sexual orientation. Women ($t(853.46) = 5.37$, $p < .001$, $d = 0.26$) and students who self-identified as LGBT+ ($t(354.41) = 3.14$, $p = .002$, $d = 0.20$) were significantly more likely to have experienced at least one form of GBV compared to men and heterosexual students. Although these differences were statistically significant, the effect sizes were small, indicating modest but meaningful differences in the likelihood of experiencing GBV. Specifically, 60% of women and 47% of men, 66% of LGBT+ students and 56% of heterosexual students reported experiencing at least one form of GBV.

Significant gender differences were found in the prevalence of psychological violence ($t(809.511) = 5.99$, $p < .001$, $d = 0.30$) and sexual harassment ($t(935.834) = 6.68$, $p < .001$, $d = 0.30$), with women reporting higher exposure in both categories. Significant differences based on sexual orientation were found in the prevalence of sexual harassment ($t(264.84) = 4.81$, $p < .001$, $d = 0.38$), with LGBT+ students reporting higher exposure compared to heterosexual students.

Reporting of GBV incidents

Even 93% of students who experienced GBV did not report it. Among the reasons for not reporting incidents of GBV, more than one-third of the victims (39%) said they felt uncertain whether the behaviour was serious enough to report. Another common reason for not reporting was that victims did not always recognise the behaviour as violence at the time of the incident, indicated by 27% of the victims. Additionally, one in four respondents believed that reporting would not result in an appropriate reaction (Figure 3).

Figure 3: Reasons for not reporting incidents of GBV.



Discussion and Conclusions

These findings suggest that the prevalence of GBV among students at the University of Belgrade reflects the general pattern observed across European universities participating in the UniSAFE study. The overall prevalence of GBV among students at the University of Belgrade (57%) is almost identical to the prevalence observed in the total UniSAFE sample (58%), including similar prevalence rates for individual forms of GBV (Lipinsky et al., 2022).

Our findings, align with Nowrouzi-Kia et al. (2024) indicate that a significant number of students experience not only isolated incidents but also multiple and overlapping forms of GBV, potentially exacerbating the psychological and social consequences. Psychological violence emerged as the most widespread and recurrent form of GBV.

Women and LGBT+ students are more likely to experience GBV in university context, consistent with previous research (Humbert & Strid, 2024; Rothman et al., 2021; Vergas et al, 2021), highlighting the increased vulnerability of these groups and the need for targeted interventions.

The relatively high percentage of repeated occurrences indicates a need for targeted prevention measures and institutional support for affected students. Respondents who have experienced GBV are more likely to feel unsafe and unwell. The results have important practical implications: it is essential to establish institutional mechanisms for the prevention and intervention of all forms of GBV in the academic context, with a particular focus on psychological violence. Additionally, it is essential to educate students and staff on recognizing GBV and improving reporting mechanisms. Practical solutions, such as toolkits developed within the UniSAFE project, can serve as valuable resources to address these challenges.

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