PROCEEDINGS OF THE XXXII INTERNATIONAL SCIENTIFIC CONFERENCE

EMPIRICAL STUDIES IN PSYCHOLOGY

APRIL 24–26, 2026
FACULTY OF PHILOSOPHY, UNIVERSITY OF BELGRADE



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LABORATORY FOR EXPERIMENTAL PSYCHOLOGY
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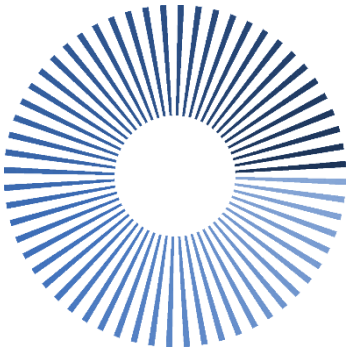

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CONTENTS

COGNITIVE PSYCHOLOGY

Cognitive styles and statistical mindware as predictors of performance and confidence in reasoning problems 9
Pavle Valerjev, Igor Bajšanski, Patrik Mandić

Answer Changing in Intelligence Tests - Metacognitive Control and the Interplay between Intelligence, Personality and Retrospective Confidence 13
Milica Manojlović, Goran Opačić

Epistemic Authority Type and Risky Decision-making: are we more Susceptibile to the Framing Effect when Advised by AI or a Scientist-Physician? 16
Maša Andrić, Kaja Damnjanović

CLINICAL PSYCHOLOGY

Dark Traits Go Online: Motivational Pathways to Social Media Screen Time 20
Jelena Spasić, Ivana Peruničić Mladenović, Nikola Petrović, Dragan Bjelica

Predictive Power of the FoMO Effect on Depression, Anxiety, Stress, and Mental Health: The Mediating Role of Emotion Regulation Strategies 23
Tijana Simić, Dragana Stanojević

How Frequency, Duration, and Intensity of Physical Activity Relate to Mental Health: A Multidomain Analysis 26
Nataša Savić, Danilo Abramović, Nikola Aćimović, Andrijana Arnaut, Arijana Radić, Lana Lugonja Prodanović, Siniša Subotić

PSYCHOLOGY OF PERSONALITY AND INDIVIDUAL DIFFFERENCES

Associations Between Basic Personality Dimensions and Coping Styles, Depression, Anxiety, and Stress Among University Students 31
Kristina Jovanović, Miljana Pavićević

We're All Just Two Bad Scores Away from Wreckage: How Personality Traits Predict Driving Behaviors 34
Arijana Radić, Aleksandar Tošić, Anastasija Jerinić, David Čajić, Svetlana Borojević

The Relationship Between Grandiose and Vulnerable Narcissism and HEXACO Personality Dimensions in High School Adolescents 39
Nenad Lazarević

Relations Between Dark Triad Traits and HEXACO Personality Dimensions in High School Adolescents 42
Nenad Lazarević

DEVELOPMENTAL PSYCHOLOGY

"You Did [X], Now I'll Spank Your Ass": Parental Reasons for Endorsing Corporal Punishment of Children 45
Jelena Bačić, Lana Aničić, Milica Ćurčija, Anđela Popović, Andrijana Arnaut, Arijana Radić, Siniša Subotić

Parental and Teacher Mediation of Adolescent Generative Artificial Intelligence (GenAI) Use in Serbia: Adolescent Perspectives 49
Tijana Milošević, Dobrinka Kuzmanović

EDUCATIONAL PSYCHOLOGY

The Relationship between School Climate and Multicultural School Practices with the Social Identification of Students 53
Marijana Vitorović, Danijela S. Petrović, Nataša Simić

The Three Musketeers of Higher-Order Cognition Ride Again: Implicit Understandings of Intelligence, Creativity, and Wisdom 56
Tamara Stanarević, Siniša Subotić

Differences in Intercultural Competence Among Teachers Across Levels of School Climate Perception 61
Milena Belić, Danijela S. Petrović, Đerđi Erdeš Kavečan

Musical Activities and Socio-Emotional and Behavioral Skills of Roma Children 64
Tara Veljković, Blanka Bogunović, Maša Brkanović, Emilija Maksimović

PSYCHOLOGY OF ART

The Effect of Narrative on the Aesthetic Evaluation of Yugoslav Industrial Design: Role of Vicarious Nostalgia 68
Jelena Stanojević, Lara Perić

WORK AND ORGANIZATIONAL PSYCHOLOGY

Work Stress as a Mediator Between Workplace Characteristics and Job Satisfaction Among Correctional Security Officers 72
Vicko Ćudina

Predicting Leadership Style Preferences from HEXACO Personality Traits 75
Danica Nikolić Vesković

Role Ambiguity and Job Satisfaction: The Role of Positive Relationship Management 78
Ana Petrović, Ivana B. Petrović

Cybervetting: Cognitive, Emotional and Behavioral Reactions Observed Among Serbia's Youth 81
Maša Engler, Jelena Pavlović, Milanko Čabarkapa

SOCIAL PSYCHOLOGY

Perception of Political Anomie and RWA as Predictors of the Conspiracy Mentality 85
Dunja Mićunović, Anja Bošnjak, Anja Simonović

Free Speech-to-Text Software for Serbian: A Step-by-Step Tutorial and Evaluation Using Noisy Interview Recordings 88
Nevena Mijatović

Do Authoritarianism and Trust in Science Predict Conspiracy Mentality and in What Way? 91
Jana Božović, Iva Vučetić, Anja Simonović

"Braća Jugosloveni": The role of personal contact and nationalism in predicting negative stereotypes about other nations 94
Žan Lep, Žiga Mekiš Recek

Ethno-Religious and Supranational Identity Configurations Among Youth in the Republic of Srpska: A Person-Centered Exploration 98
Siniša Lakić, Srđan Dušanić, Vladimir Turjačanin

What Shapes Physical Appearance Satisfaction? The Effects of Body Shape, Body Image, and Self-Objectification 101
Kristina Puzović, Bojana M. Dinić

Fifty-fifty? Or not?: Patriarchal Values and Household Labor as Predictors of Women's Mental Health 104
Ivana Tišma, Aleksandra Prokić, Marija V. Čolić

Factorial Validity of the Three-dimensional Political Orientation Questionnaire in the Serbian Context 107
Katarina Stošić, Una Branković, Tamara Milić, Ivana Milenković, Milica Ninković

In Joy and Sorrow – Relationship Dynamics from the Perspective of Women Going Through IVF 110
Milica Skočajić

Life Satisfaction, Well-Being, Spirituality, and Religiosity Among Adolescents in the Republic of Srpska 113
Milana Damjenić Mihaldžić, Lana Vujaković, Srđan Dušanić

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Cognitive styles and statistical mindware as predictors of performance and confidence in reasoning problems

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Abstract

This study examined how cognitive styles and statistical mindware predict reasoning performance and metacognitive confidence across different reasoning domains. A sample of 176 students completed categorical syllogisms, base-rate problems, conjunction fallacy tasks, and modified Cognitive Reflection Test (CRT) items while also rating confidence in their responses. Need for Cognition (NFC) and Actively Open-Minded Thinking (AOT) were used as indicators of cognitive style, whereas the Statistical Reasoning Test (TSR) assessed statistical mindware. Multiple regression analyses showed that these predictors significantly explained performance on CRT items, syllogisms, and conjunction fallacy tasks, whereas prediction of base-rate performance was weaker. The predictive contributions of NFC, AOT, and TSR varied across task types, suggesting that the influence of cognitive styles and mindware depends partly on reasoning domain. Hierarchical regression analyses further showed that, after controlling for accuracy, cognitive styles and statistical reasoning explained additional variance in confidence judgments for CRT, syllogistic, and base-rate tasks, but not conjunction fallacy tasks. Findings indicate that cognitive styles and statistical mindware contribute to both reasoning performance and metacognitive confidence, although their effects are not uniform across reasoning paradigms.

Keywords: reasoning; metacognition; cognitive styles; actively open-minded thinking; mindware

Introduction

Reasoning performance is correlated with analytic thinking style, including actively open-minded thinking (AOT; willingness to consider alternative options), and need for cognition (NFC; tendency to engage in and enjoy thinking activities) (Stanovich et al., 2016). Within contemporary dual-processing accounts of thinking, successful reasoning depends not only on these analytic tendencies, but also on the ability to instantiate relevant rules and knowledge structures during problem solving (Stanovich, 2018). Previous studies further suggest that statistical reasoning may function as a form of mindware in reasoning tasks, although its contribution appears to vary across reasoning domains (Rapan & Valerjev, 2021; Valerjev & Dujmović, 2022; Valerjev & Dujmović, 2024b). Although individual differences in reasoning performance have been extensively studied, substantially less attention has been devoted to individual differences in meta-reasoning, particularly confidence judgments about reasoning outcomes.

Confidence judgments have a monitoring function during reasoning and can influence subsequent cognitive processing (Ackerman & Thompson, 2015, 2017). Previous studies examining confidence judgments across syllogistic, base-rate, conjunction, and Cognitive Reflection Test (CRT) tasks showed that confidence is only partially related to objective performance and is influenced by various heuristic processes (Bajšanski et al., 2019; Dujmović & Valerjev, 2018; Dujmović et al., 2021; Valerjev, 2019). Research further suggests that stable individual differences explain additional variance in metacognitive judgments beyond actual performance (Valerjev & Dujmović, 2024a). However, less is known about whether cognitive styles and statistical mindware contribute similarly across different reasoning domains.

The present study aimed to examine whether cognitive styles and statistical mindware predict both reasoning performance and confidence judgments across different reasoning tasks, including syllogistic reasoning, base-rate problems, conjunction fallacy tasks, and modified CRT items. Specifically, the study aimed to test whether AOT, NFC, and statistical reasoning ability (TSR) show stable or task-specific contributions to reasoning accuracy and metacognitive confidence.

Method

Participants

Participants were 176 students (46 males; M_{age} = 22.75 years; SD_{age} = 3.40) from the Faculty of Humanities and Social Sciences, University of Mostar.

Materials and procedure

Measures of cognitive style included the AOT questionnaire (Stanovich & Toplak, 2023; 13 items, 6-point scale; Cronbach's alpha = .74) and the NFC questionnaire (Cacioppo et al., 1984; 18 items, 7-point scale; Cronbach's alpha = .85). For both scales, the total

score was computed by summing the item scores. Statistical mindware was measured by the TSR (Rapan & Valerjev, 2020; 11 items, Cronbach's alpha = .85). Reasoning problems included 6 CRT problems (Frederick, 2005; Valerjev, 2019), 6 syllogistic problems (SYLL; Bajšanski et al., 2019), 10 base-rate problems (BR; Dujmović & Valerjev, 2018), and 10 conjunction fallacy problems (CF; Dujmović et al., 2021). For all reasoning problems and the TSR, total performance scores were calculated as the number of correct responses, with higher scores indicating better performance. After solving each reasoning problem, participants rated their confidence on a 7-point scale, ranging from 1 (not confident at all) to 7 (fully confident). Mean confidence across all items was calculated for CRT, BR, SYLL, and CF. Finally, they completed measures of cognitive styles and mindware.

Results

Descriptive data for all variables are presented in Table 1.

Table 1: Descriptive data.

Variable	*Min*	*Max*	*M*	*SD*
CRT	0	6	2.80	1.73
SYLL	0	6	2.76	1.23
BR	3	10	7.20	1.97
CF	3	10	6.82	1.63
AOT	32	75	54.82	8.62
NFC	32	83	58.10	11.12
TSR	1	10	5.36	2.30

Note. AOT = Actively Open-Minded Thinking; NFC = Need for Cognition; TSR = Statistical Reasoning Test; CRT = Cognitive Reflection Test; SYLL = Categorical Syllogisms; BR = Base-Rate Problems; CF = Conjunction Fallacy Tasks.

Correlations between reasoning performance, cognitive styles, and statistical reasoning are presented in Table 2. AOT showed small to moderate positive correlations across all reasoning tasks, whereas NFC correlations were generally weak. Statistical reasoning ability was most strongly associated with CRT performance and syllogistic reasoning.

Table 2: Correlations between reasoning accuracy, cognitive styles, and statistical reasoning.

Task	AOT	NFC	TSR
CRT	.32***	.20***	.45***
SYLL	.24**	.11	.27***
BR	.19*	.02	.12
CF	.22**	.07	.03

Note. AOT = Actively Open-Minded Thinking; NFC = Need for Cognition; TSR = Statistical Reasoning Test; CRT = Cognitive Reflection Test; SYLL = Categorical Syllogisms; BR = Base-Rate Problems; CF = Conjunction Fallacy Tasks. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Regression analyses predicting reasoning accuracy are presented in Table 3. The overall models significantly predicted performance on CRT (R^2 = .23, $F(3, 172)$ = 17.66, $p < .001$), SYLL (R^2 = .10, $F(3, 172)$ = 6.17, p = .001), and CF tasks (R^2 = .05, $F(3, 172)$ = 3.19, p = .025), whereas prediction of BR performance was weaker (R^2 = .04, $F(3, 172)$ = 2.49, p = .062). AOT emerged as the most consistent predictor across reasoning domains. TSR showed significant positive effects for CRT and SYLL tasks, but not for BR or CF tasks. NFC did not explain unique variance in reasoning performance.

Table 3: Standardized regression coefficients (β) for reasoning performance.

Predictor	CRT	SYLL	BR	CF
AOT	.16*	.16*	.19*	.24**
NFC	.08	.02	−.04	.00
TSR	.37***	.21**	.06	−.05

Note. AOT = Actively Open-Minded Thinking; NFC = Need for Cognition; TSR = Statistical Reasoning Test; CRT = Cognitive Reflection Test; SYLL = Categorical Syllogisms; BR = Base-Rate Problems; CF = Conjunction Fallacy Tasks. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Correlations between confidence judgments in four reasoning tasks, reasoning accuracy, cognitive styles, and statistical reasoning are shown in Table 4. Confidence judgments were moderately related to accuracy only for CRT tasks, whereas associations for other reasoning tasks were generally weak. Statistical reasoning ability showed positive associations with confidence in CRT, SYLL and BR tasks.

Table 4: Correlations between confidence in four reasoning tasks, accuracy in same tasks, two cognitive styles, and statistical reasoning.

Task	Accuracy	AOT	NFC	TSR
CRT	.41***	.19*	.20**	.36***
SYLL	.10	.13	.24**	.17*
BR	.03	.01	.07	.21**
CF	.06	−.02	.04	.09

Note. AOT = Actively Open-Minded Thinking; NFC = Need for Cognition; TSR = Statistical Reasoning Test; CRT = Cognitive Reflection Test; SYLL = Categorical Syllogisms; BR = Base-Rate Problems; CF = Conjunction Fallacy Tasks. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Table 5: Standardized regression coefficients (β) for confidence in reasoning performance.

Predictor	CRT	SYLL	BR	CF
Step 1				
Accuracy	.41***	.10	.03	.06
Step 2				
Accuracy	.30***	.05	.02	.07
AOT	−.01	.01	−.09	−.09
NFC	.11	.21**	.06	.04
TSR	.21**	.12	.23**	.11

Note. AOT = Actively Open-Minded Thinking; NFC = Need for Cognition; TSR = Statistical Reasoning Test; CRT = Cognitive Reflection Test; SYLL = Categorical Syllogisms; BR = Base-Rate Problems; CF = Conjunction Fallacy Tasks. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Hierarchical regression analyses predicting confidence judgments are presented in Table 5. After controlling for reasoning accuracy, cognitive styles and statistical reasoning explained additional variance in confidence judgments for CRT (ΔR^2 = .05; Total R^2 = .22, $F(4, 171)$ =

11.78, $p < .001$), SYLL ($\Delta R^2 = .07$; Total $R^2 = .08$, $F(4, 171) = 3.62$, $p = .007$), and BR tasks ($\Delta R^2 = .05$; Total $R^2 = .05$, $F(4, 171) = 2.27$, $p = .064$), but not for CF tasks. NFC positively predicted confidence in SYLL tasks, whereas TSR predicted confidence in CRT and BR tasks. AOT did not explain unique variance in confidence judgments after controlling for accuracy.

Discussion and conclusions

The present study examined whether cognitive styles and statistical mindware predict reasoning performance and metacognitive confidence across different reasoning domains. The findings indicate that these predictors do not contribute uniformly across reasoning tasks, supporting the view that successful reasoning partly depends on task-specific cognitive demands and the instantiation of relevant mindware (Stanovich, 2018).

AOT emerged as the most consistent predictor of reasoning performance across tasks, suggesting that actively open-minded thinking reflects a general tendency toward more analytic and reflective responding. In contrast, statistical reasoning ability predicted performance primarily for CRT and syllogistic reasoning, while showing weaker effects for base-rate and conjunction fallacy tasks. This pattern is consistent with previous findings suggesting that statistical mindware does not transfer uniformly across reasoning domains (Rapan & Valerjev, 2021; Valerjev & Dujmović, 2024b). At the same time, previous research found statistical reasoning to be related to performance across several classic reasoning paradigms (Valerjev & Dujmović, 2022), whereas the present findings suggest that its unique predictive contribution may be more task-specific. Tasks such as conjunction problems may depend more strongly on representativeness-based processing than on the application of statistical rules (Dujmović et al., 2021).

Outside of CRT tasks, confidence judgments were not correlated with accuracy, suggesting that metacognitive monitoring is not determined solely by actual performance. After controlling for reasoning accuracy, cognitive styles and statistical reasoning accounted for additional variance in confidence judgments across several reasoning tasks. These findings are in line with previous research indicating that stable individual differences contribute to metacognitive judgments beyond objective task performance (Valerjev & Dujmović, 2024a).

The main limitation of this study is its student sample, possibly resulting in restricted variability, particularly in statistical reasoning and cognitive styles. Future studies should include more representative samples.

In conclusion, the present findings suggest that cognitive styles and statistical mindware contribute differently across reasoning domains and metacognitive judgments. While actively open-minded thinking showed relatively consistent associations with reasoning performance, the contribution of statistical reasoning varied across tasks. Additionally, confidence judgments were only partially related to objective accuracy, supporting the importance of individual differences in meta-reasoning. Overall, the findings suggest that both reasoning performance and metacognitive confidence reflect an interaction between cognitive styles, statistical mindware, and task-specific reasoning demands.

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Answer Changing in Intelligence Tests – Metacognitive Control and the Interplay between Intelligence, Personality and Retrospective Confidence

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Abstract

This study aimed to disentangle the contributions of retrospective confidence judgements, fluid and crystalized intelligence, and basic personality traits to the decision to revise an initially provided response in the context of intelligence testing, i.e. to engage in answer changing. In this paper we operationalized answer changing as a continuous variable, by automatically counting each switch between the answers participants made, rather than just reporting whether they had the chance to change their answers or not. A total of 2674 adults filled out a general knowledge test, along with retrospective confidence judgements, while answer changing was recorded for each item by the TotalAssesment platform. We also measured basic personality traits as well as fluid and crystalized intelligence. Answer changing across tasks was most strongly, positively predicted by both fluid and crystalized intelligence, Honesty-Humility, and Agreeableness, while retrospective confidence judgements accuracy barely contributed to this prediction. Taken together, these results point to a more complex view of answer changing and suggest that it also may be related to many dispositional traits.

Keywords: answer changing; metacognitive control; metacognitive monitoring; intelligence testing; basic personality

Introduction

Answer changing (AC) refers to the act of revising an already provided response in a testing situation (Liu et al., 2015). In the context of contemporary views on metacognition (Dunlosky & Bjork, 2008), answer changing is seen as an aspect of metacognitive control (Roebers & Spiess, 2017) – it is considered to be an executive activity that individuals use to in order to increase test performance. As any other aspect of metacognitive control, answer changing is dependent on metacognitive monitoring and its accuracy (Ger & Buehler, 2024). That is, the decision to revise an already provided answer stems from reduced confidence in its accuracy, usually measured via retrospective confidence judgments (RCJ) (CastelLano et al., 2022; Couchman et al., 2016; Tiffin-Richards et al., 2022).

Relatively little is known about the predictive validity of individual differences in the context of metacognitive control. Only one study to date has directly assessed the relationship between personality and answer changing (Sitton et al., 1980), with the authors finding Extraversion and Neuroticism to be moderately related to answer changes practices. Later studies mainly focused on Anxiety either as a trait-like disposition or specifically in test-taking contexts (Afolabi et al., 2007). Such papers found a positive relationship between this aspect of Neuroticism and the tendency to change initially provided answers. We did not find any papers assessing the relationship between answer changing, or any other aspect of metacognitive control for that matter, and other personality traits from HEXACO or the Big Five personality models.

Additionally, little is known about the relationship of AC and intelligence. Many papers show that the most competent participants, e.g. students with the highest GPA or those who exhibited the highest scores on the test in general have the most benefits form answer changing (Liu et al., 2015) and tend to engage in more response revisions (Bridgeman, 2012). This indirectly implies that intelligence ought to be positively related to AC.

The majority of the previously mentioned studies measure answer changing by instructing participants to fill out multiple choice questionnaires, and after all answers have been provided, (some) participants are given the chance to revise their answers. Although standardly used, this practice has been described as lacking in ecological validity (Siedlecka et al., 2025), as participants are not allowed to spontaneously return to specific items and change the provided answers during the test taking process. This also limits participants to conduct one answer change per item, which does not reflect the common test taking practice where students can go back and forth between multiple answers before making the final decision (Siedlecka et al., 2025).

We aimed to explore the way answer changing relates to metacognitive monitoring, basic personality traits, and intelligence. In this paper we also implemented a novel procedure for measuring answer changing, which is more suitable for the individual differences approach we take in our study.

Method

Participants and Procedure

A total of 2674 (55.8% female, M_{age} = 22.14, SD_{age} = 2.06) young adults took part in this study. They were sampled through an entrance exam while applying for jobs at the Ministry of Internal Affairs of the Republic of Serbia. Participants completed the study via the Total Assessment platform. Participation in the study was voluntary and all

participants provided informed consent. The average time for completing the battery was around 45 minutes.

Instruments

General knowledge test. 40 questions assessing factual knowledge across a range of domains (e.g. history, geography, science, culture) created for the purpose of this study.

Retrospective confidence judgments (RCJ). After providing their final answer for each item of the general knowledge test, participants were asked: *How sure are you that the answer you provided is indeed correct?* The confidence judgments were provided on a 11 point Likert scale (1 – 0% confident in the response, 11 – 100% confidence in the response). Based on these assessments we calculated monitoring accuracy scores. They represent the difference between mean confidence and actual performance for each participant.

Answer changing. Total Assessment platform automatically recorded how many times participants switched between the answers before moving on to the next question. At the beginning of the test participants were explicitly instructed they can change their answer before moving to the next question.

ALF7 (Wolf et al., 1992). Intelligence test measuring serial processing in KOG-9 battery. It consists of 39 verbal analogies.

AL4 (Wolf et al., 1992). Intelligence test measuring serial processing in KOG-9 battery. It consists of 40 word pairs and participants have to decide are they synonyms or antonyms.

IT2 (Wolf et al., 1992). Intelligence test measuring parallel processing. It consists of 39 3D objects and participants are asked to find their 2D unfolded pattern.

S1 (Wolf et al., 1992). Intelligence test measuring parallel processing. It consists of 30 3D figures and a direction from which the figure is looked at. Participant have to choose the right 2D view of the figure form that perspective.

HEXACO-60 (Ashoton & Lee, 2009). 60-item personality assessment test, with 29 negatively coded items. Each personality trait (honesty, emotionality, extraversion, cooperation, conscientiousness and openness) is represented by a total of 10 items, and each of the four facets within the trait is operationalized with two or three items.

Results

Data analysis was conducted in IBM SPSS v22. We performed stepwise regression analysis, with retrospective confidence judgements accuracy, personality, intelligence measures, age, and gender as predictors of answer changing. This model significantly predicted answer changing on the general knowledge task ($F (11, 1933) = 13.544$, $p < .001$, $R^2 = .141$). Significant contributions to the prediction of AC in the final step of the model were made by Honesty-Humility ($\beta = .286$, $p < .001$), fluid intelligence ($\beta = .279$, $p < .001$), crystalized intelligence ($\beta = .153$, $p < .001$), Agreeableness ($\beta = .137$, $p = .001$), Emotionality ($\beta = -.117$, $p = .016$), Extraversion ($\beta = .109$, $p = .011$), confidence accuracy on the task ($\beta = -.089$, $p = .006$), and participants' age ($\beta = -.088$, $p = .005$).

Discussion

The main goal of this study was to examine and expand our understanding of the relationship between answer changing, a measure of metacognitive control, and related constructs - metacognitive monitoring, basic personality traits, and intelligence.

We obtained an unexpectedly weak relationship between metacognitive monitring accuracy and AC on a large sample. This challenges classical metacognitive accounts (Liu et al., 2015; CastelLano et al., 2022) in which answer changing is assumed to be an adaptive, monitoring-driven behavior. The relationships between AC and intelligence and basic personality traits further imply AC to be more of a dispositional behavior, not a pure mechanism of metacognitive control.

Honesty and Agreeableness emerged as one of the strongest predictors of AC. Individuals that score higher on these traits are considered to be more tolerant, express grater sincerity, and are generally more open to changing their opinions in social contexts (Ashton & Lee, 2009). These characteristics facilitate answer revisions, especially in the absence of a strong sense of metacognitive certainty. This aligns with a recent study (Ozturk, 2020) that found Agreeableness, Conscientiousness, and Openness to be the strongest predictors of self-reported metacognitive regulation behaviors (including AC).

Both fluid and crystalized intelligence represented the most robust predictors of the tendency to change answers. More pronounced intellectual abilities entail grater cognitive flexibility (Colzato et al., 2006) which in return enables for a more efficient evaluation of alternative answers. These claims can be corroborated through findings that higher intelligence is associated with more flexible decision making, and the usage of strategies that require reevaluating multiple alternatives (Di Fabio & Saklofske, 2014).

To the best of our knowledge, this is one of the first study to simultaneously assess the relationship between AC and metacognitive monitoring, intelligence, and basic personality traits, thus providing a more in-depth understanding of individual differences in this domain. AC was measured in a more ecologically valid manner, by counting each spontaneous revision that occurred during the test taking process. We present evidence that this measure of AC has trait-like characteristics as it is primarily predicted by Honesty-Humility, Agreeableness, and psychometric intelligence, rather than monitoring accuracy.

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Epistemic Authority Type and Risky Decision-making: are we more Susceptibile to the Framing Effect when Advised by AI or a Scientist-Physician?

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Abstract

The risky choice framing effect is a cognitive bias where different descriptions of identical outcomes lead to divergent risk preferences. While original dilemmas attributed proposed solutions to medical experts, subsequent research often neglected the impact of the recommendation source. This study investigated how epistemic authority modulates susceptibility to the framing effect. Using a between-subjects Asian Disease Problem (N=401), participants evaluated plans authored by an unspecified source, human experts, an AI tool, or a combination of both. Scenarios were framed positively (gains) or negatively (losses). Results confirmed the classical framing effect, yet authority type strongly influenced decisions. Human experts communicating losses elicited robust risk-seeking behavior, aligning with loss aversion. Conversely, AI authorities, alone or combined, attenuated this bias, yielding balanced choices. We theorize that algorithmic objectivity acts as a cognitive buffer, suppressing affective processing in favor of analytic evaluation.

Keywords: framing effect, risky decision-making, epistemic authority, artificial intelligence, prospect theory

Introduction

The risky-choice framing effect occurs when presenting options with positive (gains) or negative (losses) descriptions alters risk-taking and decision-making, despite identical expected values. According to Prospect Theory (Tversky & Kahneman, 1981), this bias stems from an S-shaped value function that induces risk aversion for gains and risk-seeking for losses around a reference point (Kahneman & Tversky, 1979). Beyond formal syntax, framing effects are heavily influenced by the task's surface structure, including contextual prologs and decision domains (Bless et al., 1998; Sher & McKenzie, 2006), and this is especially prominent in high-stakes life-and-death dilemmas (Damnjanović, 2014; Fagley & Miller, 1997). In the original Asian Disease Problem, the proposed programs were explicitly authored by medical experts. However, this element of surface structure - epistemic authority - gradually disappeared from later research, being neither investigated nor even mentioned in subsequent task adaptations.

Medical experts traditionally elicit high trust in health dilemmas (Siegrist et al., 2002). Conversely, artificial intelligence (AI) generates mixed reactions, ranging from algorithm aversion in moral choices (Dietvorst et al., 2015) to algorithm appreciation due to perceived objectivity (Logg et al., 2019). Combining human expertise with AI tools is often perceived as the most reliable decision framework (Binns et al., 2018). In this study, we examined whether varying the recommendation source (human or AI) in the Asian Disease Problem modulates the magnitude of framing in a life-saving domain.

Method

Participants

A convenience community sample of 401 participants (69.9% female, Mage = 44.24) from the general population was used. Data collection was initially targeted at 241 participants based on a priori power analysis; however, it continued until 401 participants were recruited to compensate for unbalanced cell sizes caused by a software randomization issue. Consequently, participants were randomly assigned to one of the eight experimental conditions (approximately 50 participants per cell), meaning each participant evaluated only a single scenario.

Materials

We constructed risky decision-making tasks based on the Asian Disease Problem, restricted to the domain of human lives. We manipulated the surface structure by varying the epistemic authority recommending the plans: unspecified author (control), scientist-physician (SP), artificial intelligence (AI), and scientist-physician using AI (SPAI), while controlling the deep structure and expected value to be the same across the tasks. Each condition was presented in a positive (gains) and negative (losses) frame. By combining the frame (2) with epistemic authority (4), we made 8 tasks.

To adapt the stimuli and ensure linguistic validity, a pilot study (N=27) was conducted. Based on pilot ratings, we minimized post-COVID-19 bias by phrasing the scenario as an epidemic of a "newly discovered disease". Furthermore, we selected the most trusted descriptions for the AI systems, equated the emotional valence and arousal of the outcome words (e.g., "save a life" vs. "survive"), and strictly controlled the word count across all task versions (ranging from 57 to 64 words) to prevent reading-time confounds.

Procedure and design

The study employed a 2 × 4 between-subjects factorial design, yielding eight unique experimental scenarios. The independent variables were the decision frame (positive vs. negative) and the epistemic authority of the plan's author (Control (unspecified author), Scientist-Physician (SP), Artificial Intelligence (AI), and Scientist-Physician using AI (SPAI). The primary dependent variable was the percentage of risky choices. Data were collected online via the SoSci Survey platform using a snowball sampling method. After providing informed consent, participants were randomly assigned to one of the eight experimental conditions, meaning each participant evaluated only a single scenario. They read the given text, made a forced choice between the two proposed action plans, and answered basic demographic questions. The entire procedure took approximately 4 minutes to complete.

Results

To evaluate the impact of linguistic formulation and epistemic authority on risky decision-making, data were analyzed across the entire sample and within specific experimental conditions. The dependent variable—the choice between a safe and a risky option - was examined using Pearson's chi-square tests, reporting ϕ and Cohen's w as effect sizes.

The General Risky Choice Framing Effect

An omnibus analysis across all four epistemic authority conditions confirmed the presence of the classical risky choice framing effect. A statistically significant association was registered between the decision frame and the chosen option, χ^2 (1, N = 401) = 4.01, p = .045, ϕ = .10. In the positive frame, participants exhibited a balanced distribution (49% safe, 51% risky), whereas the negative frame elicited a pronounced shift toward risk-seeking behavior (39,1% safe, 60,9% risky). The modest effect size ($\phi = .10$) indicates the risky choice framing effect magnitude was relatively weak.

The Role of Epistemic Authority

To test if the type of epistemic authority modulates this cognitive bias, bivariate tests were conducted within each condition. The explicit introduction of categorized authorities did not yield a statistically significant framing effect within any isolated group. When the source was unspecified, no significant difference occurred, χ^2 (1, n = 101) = 1.29, p = .257, ϕ = .11. Plans authored by human experts (scientist-physician) also failed to produce a significant between-frame difference, χ^2 (1, n = 98) = 0.98, p = .322, ϕ = .10. When an Artificial Intelligence tool formulated the plans, the effect was maximally attenuated, χ^2 (1, n = 98) = 0.34, p = .560, ϕ = .06. The combined authority condition (experts utilizing AI) similarly lacked significance, χ^2 (1, n = 104) = 1.39, p = .238, ϕ = .12.

Directional Preferences

Univariate goodness-of-fit tests assessed whether choices within specific frames deviated significantly from equiprobability. The most prominent deviation was registered within the scientist-physician group under the negative frame. Participants demonstrated a statistically significant tendency toward the risky option (66% risky vs. 34% safe), χ^2 (1, N = 50) = 5.12, p = .024, w = .32.

Conversely, the AI and combined authority conditions displayed balanced, non-significant distributions.

Discussion

The findings support the premise that linguistic framing alters risk preferences. However, the modest omnibus effect and the absence of significant bivariate effects within isolated conditions suggest this bias is highly sensitive to surface structure. Crucially, human experts (scientist-physician) communicating mortality risks elicited clear loss aversion and risk-seeking behavior. In contrast, AI and combined authorities attenuated this bias, yielding balanced choice distributions. This indicates that AI may function as a cognitive buffer. Its perceived objectivity likely suppresses affective, heuristic-driven processing in favor of analytic evaluation, aligning with emotional-motivational models of decision-making. As trust was not directly measured, the exact mechanism remains theoretical. Future research must disentangle how algorithmic objectivity versus human empathy modulates risk preferences. Given the factorial design of the present study, future research should employ binary logistic regression to directly test the Frame × Epistemic Authority interaction, providing a more rigorous statistical evaluation of these underlying mechanisms.

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Dark Traits Go Online: Motivational Pathways to Social Media Screen Time

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Abstract

The relationship between personality traits and time spent on social media has been studied, however the findings are often weak or inconsistent, possibly because personality traits are assumed to directly predict screen time. An alternative perspective suggests that personality influences how individuals use social media, and that these patterns of use, rather than traits themselves, are what relate to the amount of time spent online. This study examines whether patterns of social media use: 1) self-presentation, connection, and popularity, 2) relationship maintenance and shared values, and 3) trolling, provocation, and entertainment, represent pathways linking the dark tetrad traits (Machiavellianism, narcissism, psychopathy, and sadism) to objectively recorded screen time. The results indicate that the dark tetrad traits are not directly related to screen time, but through specific patterns of use. Machiavellianism and narcissism are linked to increased screen time via self-presentation, connection, and popularity; while sadism is linked to increased screen time via trolling, provocation, and entertainment. These findings highlight the importance of considering how people use social media, rather than how much time they spend online.

Keywords: screen time; dark tetrad; patterns of behavior; motives; social media

Introduction

Social media has become a central context of everyday life, particularly among youth, and it has become a type of behavioral routine embedded in our everyday lives (Leo et al., 2023). It is also being regarded as much more than a communication channel (Wong & McLellan, 2024), but rather a space in which a wide range of social, psychological, and self-presentational activities take place. Researchers increasingly emphasize the importance of how people use social media, not only how much time they spend on it (Prasetya, 2024).

Individual differences in personality have been consistently linked to online behavior (Washburn et al., 2024). Of particular relevance are the dark tetrad traits – Machiavellianism, narcissism, psychopathy, and sadism – which reflect socially aversive interpersonal tendencies (Paulhus, 2014). Previous research has linked these traits to behaviors such as self-presentation (Dumas et al., 2017; Sanecka, 2017), goal-oriented self-presentation (Nitschinsk et al., 2022), antagonism, and trolling (Bonfa-Araujo et al., 2022; Craker &March, 2016; March, 2019).

However, associations between personality traits and time spent on social media are often weak or inconsistent, with some studies showing a direct association between traits and time spent on social media (Fox & Rooney, 2015; McCain & Campbell, 2018). Our assumption is that personality may be more closely related to the specific ways in which social media is used than to screen time itself.

Method

Sample

The sample consisted of 380 participants aged between 16 and 26 years (M = 22.27, SD = 1.90). Most participants were female (74.4%), followed by males (25%), and a small proportion identified as non-binary (0.6%).

Participants were recruited through online data collection using Google Forms. Psychology students also took part and distributed the questionnaire to additional responders as part of course requirements, so the exact composition of the broader recruitment pool cannot be fully determined.

Variables and instruments

Dark personality traits were assessed using the Short Dark Tetrad (SD4; Paulhus et al., 2021), which measures Machiavellianism, narcissism, psychopathy, and sadism.

Patterns of social media use were assessed using the Motivations for Social Media Use scale (MSMU; Rodgers et al., 2021), which measures connection, popularity, appearance, and values and interests; with the addition of two subscales regarding motives from Park and Lee (2014), which measure entertainment and relationship

maintenance; and author-developed items regarding trolling and provocation.

Objective screen time was assessed from smartphone screenshots showing the average weekly time spent on social media for the previous week.

Procedure and Data Analysis

Participants completed the online questionnaire and uploaded screenshots of the smartphone-recorded weekly average of social media screen time for the previous week.

Unrotated principal component analysis (PCA) was used to reduce the dimensionality of social media use measures and identify broader social media use components. Their scores were entered as observed variables in a structural equation model (SEM) linking dark traits, use patterns, and screen time. Analyses were conducted in SPSS and R (v. 4.5.2).

Results

ThePCA identified three broader components, interpreted as self-presentation, connection and popularity, relationship maintenance and shared values, and trolling, provocation, and entertainment, which jointly explained 68.14% of the variance. Component loadings are presented in Table 1.

Table 1: Principal component analysis component loadings for motives for social media use.

Motives for social media use	Component loadings		
	1	2	3
Connection	.825		
Popularity	.795		
Appearance	.849		
Values and interests		.651	
Relationship maintenance		.762	
Entertainment			.638
Trolling and provocation			.706

Dark tetrad traits did not have a significant contribution to the prediction of screen time (R^2 = .006, p = .671), and none of the individual traits showed a significant association with screen time.

Self-presentation, connection, and popularity was positively associated with narcissism (β = .20, p < .01) and Machiavellianism (β = .23, p < .001), while trolling, provocation, and entertainment was positively associated with sadism (β = .33, p < .001) and, to a lesser extent, Machiavellianism (β = .12, p < .05). Relationship maintenance and shared values was negatively associated with sadism (β = -.20, p < .001). Psychopathy was not significantly associated with any pattern of social media use.

All three patterns—self-presentation, connection, and popularity (β = .24, p < .001), relationship maintenance and shared values (β = .14, p < .01), and trolling, provocation, and entertainment (β = .15, p < .05)—were positively associated with time spent on social media, indicating that greater engagement in these behaviors is linked to increased screen time.

Finally, a structural equation model was tested to examine whether patterns of social media use account for the relationship between dark traits and screen time. The model showed a good fit to the data (χ^2 (7) = 12.53, p = .08, CFI = .97, RMSEA = .04). Significant indirect associations with screen time emerged for narcissism via self-presentation, connection, and popularity (B = 36.662, β = .049, z = 2.77, p < .01), Machiavellianism via the same component (B = 42.072, β = .056, z = 3.27, p < .01), and sadism via trolling, provocation, and entertainment (B = 36.977, β = .049, z = 2.67, p < .01).

Discussion

Dark tetrad traits showed no direct associations with screen time. Although this contrasts with previous research (Fox & Rooney, 2015; McCain & Campbell, 2018), it is consistent with the idea that screen time has limited informative value when considered by itself, because it captures the duration of social media use, but not the content of the engagement (Dorrestein et al., 2026). However, significant indirect associations emerged through specific patterns of use.

Narcissism and Machiavellianism were associated with greater screen time through self-presentation, connection, and popularity. Narcissism has been linked to online self-presentation, including seeking external validation and popularity (Dumas et al., 2017; Sanecka, 2017). Machiavellianism has been associated with goal-oriented and non-authentic self-presentation (Nitschinsk et al., 2022).

Higher sadism was associated with lower engagement motivated by relationship maintenance and shared values, and with greater engagement involving trolling, provocation, and entertainment. Both forms of engagement were associated with screen time. The latter finding is consistent with previous research linking sadistic tendencies to trolling online behavior (Bonfa-Araujo et al., 2022; March, 2019) and reduced social connectedness (Grieve, 2023).

Although linked to trolling in previous research (Craker & March, 2016), psychopathy was not significantly associated with trolling, provocation, and entertainment in the present study. One possible explanation is that psychopathy may facilitate antagonistic behavior without the enjoyment of provoking others, which appears more characteristic of sadism (Buckels et al., 2014; Buckels et al., 2019).

The limitations of this study include the cross-sectional design of the study that precludes causal conclusions, while objectively recorded screen time does not capture content or the context of social media use. Future research should examine additional indirect pathways using more detailed behavioral measures.

Conclusion

Dark traits are not directly associated with time spent on social media, but are linked to it through specific patterns of social media use. Different traits are associated with different behaviors, which are linked to increased screen time. Thus, time spent on social media alone is not partic-

ularly informative without considering how social media is being used.

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Predictive Power of the FoMO Effect on Depression, Anxiety, Stress, and Mental Health: The Mediating Role of Emotion Regulation Strategies

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Abstract

Fear of Missing Out (FoMO) is an emotional state characterized by the apprehension that others may be having more rewarding experiences than oneself(Liu et al., 2023).Although the negative consequences of FoMO have already been investigated, the psychological mechanisms underlying these relationships remain insufficiently understood. The aim of this study was to examine the association of FoMO with depression, anxiety, stress, and positive mental health among adults, while also examining the mediating role of emotion regulation strategies—expressive suppression and cognitive reappraisal. The study included 303 adult participants. FoMO was associated with higher levels of depression, anxiety, and stress, as well as lower levels of positive mental health. Expressive suppression represented a significant mechanism contributing to these relationships, whereas the role of cognitive reappraisal was not confirmed. The findings indicate that higher levels of FoMO are associated not only with greater psychological distress and lower positive mental health, but also with more frequent reliance on expressive suppression, which may further contribute to adverse mental health outcomes.

Keywords: FoMO effect, emotion regulation, psychological distress, mental health

Introduction

Contemporary communication and digital technologies have changed how individuals monitor social relationships and others' experiences. Fear of Missing Out (FoMO) is associated with less favorable emotional and psychological functioning. It involves concern that others may be enjoying rewarding experiences one is missing, alongside a desire to stay connected to their activities (Liu et al., 2023). According to Self-Determination Theory, FoMO may arise from unmet needs for autonomy, competence, and relatedness, increasing sensitivity to social information and comparison (Przybylski et al., 2013). Concern that others lead more fulfilling lives may foster inadequacy and psychological distress (Elhai et al., 2021). Emotion regulation, involving the management and expression of emotions, may link FoMO to mental health (Gross, 1998). Cognitive reappraisal changes how a situation is interpreted to alter its emotional impact, whereas expressive suppression inhibits emotional expression (Gross & John, 2003). Monitoring others' activities may evoke inadequacy, disappointment, or anxiety, while emotion regulation may influence resulting distress. Depression, anxiety, and stress are distinct but related dimensions of psychological distress (Lovibond & Lovibond, 1995). Mental health also includes positive functioning. The Mental Health Continuum Model encompasses emotional, psychological, and social well-being, ranging from languishing to flourishing (Keyes, 2002). Examining psychological distress and positive mental health together provides a more comprehensive understanding of FoMO's potential consequences.

Method

Subject and Aim of the Study

To examine the predictive power of FoMO in relation to depression, anxiety, stress, and positive mental health, while investigating the mediating role of emotion regulation strategies, namely cognitive reappraisal and expressive suppression.

Participants

The study included 303 participants (246 female and 57 male), with an average age of M = 28.4 (SD = 7.40). The study was conducted in the Republic of Serbia using an online questionnaire distributed through social media and relevant online groups. Participation was voluntary, and participants were informed about the anonymity and confidentiality of the collected data. The study included adults who provided informed consent and completed the questionnaire.

Instruments

The Fear of Missing Out Scale (FoMO-S; Przybylski et al., 2013) is a unidimensional measure of FoMO. Items (e.g., "I fear that others are having more fun than I am") are rated on a 5-point Likert scale (1 = *does not apply to me at all*, 5 = *applies to me completely*). The scale was translated into Serbian using a forward–backward translation procedure. Cronbach's alpha was .85.

The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003; Serbian adaptation: Popov et al., 2016) assesses cognitive reappraisal and expressive suppression

using a 7-point Likert scale. Cronbach's alpha was .89 for reappraisal and .92 for suppression.

The Depression, Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995; Serbian validation: Jovanović et al., 2014) comprises 21 items assessing depression, anxiety, and stress. Cronbach's alpha was .88, .87, and .86, respectively.

The Mental Health Continuum–Short Form (MHC-SF; Keyes, 2002; Serbian validation: Joshanloo & Jovanović, 2017) comprises 14 items assessing emotional, social, and psychological well-being over the previous month, rated on a 6-point scale (0 = *never*, 5 = *every day*). Higher scores indicate better mental health. Cronbach's alpha was .91.

Results

Table 1: Results of the mediation analysis of the relationship between FoMO and Depression.

Predictor	B	SE	*t*(df)	*p*	95% CI [LLCI, ULCI]
FoMO → Cognitive reappraisal	0.43	0.10	4.34(301)	< .001	[0.235, 0.626]
FoMO → Expressive suppression	0.48	0.12	3.94(301)	< .001	[0.239, 0.718]
FoMO → Depression	2.44	0.34	7.22(299)	< .001	[1.776, 3.107]
Cognitive reappraisal → Depression	−0.18	0.21	−0.83(299)	.405	[−0.597, 0.241]
Expressive suppression → Depression	0.58	0.17	3.35(299)	< .001	[0.240, 0.925]
FoMO → Cognitive reappraisal → Depression	−0.08	0.10	—	—	[−0.299, 0.124]
FoMO → Expressive suppression → Depression	0.28	0.12	—	—	[0.086, 0.536]

Note. Indirect effects are reported as unstandardized effects with bootstrap standard errors (BootSE) and 95% bootstrap confidence intervals based on 5,000 bootstrap samples.

Table 1 shows FoMO significantly positively predicted both emotion regulation strategies, as well as depression. Expressive suppression was a significant mediator of the relationship between FoMO and depression, whereas cognitive reappraisal did not have a mediating role. The model explained 20.65% of the variance in depression.

As shown in Table 2, FoMO significantly positively predicted both emotion regulation strategies and anxiety. Expressive suppression was a significant mediator of the relationship between FoMO and anxiety, whereas cognitive reappraisal did not have a mediating role. The total indirect effect was significant, and the model explained 17.79% of the variance in anxiety.

Table 3 shows FoMO significantly positively predicted both emotion regulation strategies and stress. Expressive suppression was a significant mediator of the relationship between FoMO and stress, whereas cognitive reappraisal did not have a mediating role. The total indirect effect was not significant, and the model explained 26.08% of the variance in stress.

As shown in Table 4, FoMO significantly positively predicted both emotion regulation strategies and negatively predicted positive mental health. Expressive suppression was a significant mediator of this relationship, whereas cognitive reappraisal did not have a mediating role. The total indirect effect was not significant, and the model explained 6.00% of the variance in positive mental health.

Table 2: Results of the mediation analysis of the relationship between FoMO and Anxiety.

Predictor	B	SE	*t*(df)	*p*	95% CI [LLCI, ULCI]
FoMO → Cognitive reappraisal	0.43	0.10	4.34(301)	< .001	[0.235, 0.626]
FoMO → Expressive suppression	0.48	0.12	3.94(301)	< .001	[0.239, 0.718]
FoMO → Anxiety	2.50	0.37	6.75(299)	< .001	[1.769, 3.226]
Cognitive reappraisal → Anxiety	0.05	0.23	0.20(299)	.844	[−0.413, 0.505]
Expressive suppression → Anxiety	0.42	0.19	2.19(299)	.029	[0.042, 0.792]
FoMO → Cognitive reappraisal → Anxiety	0.02	0.10	—	—	[−0.188, 0.217]
FoMO → Expressive suppression → Anxiety	0.20	0.11	—	—	[0.017, 0.442]

Table 3: Results of the mediation analysis of the relationship between FoMO and Stress.

Predictor	B	SE	*t*(df)	*p*	95% CI [LLCI, ULCI]
FoMO → Cognitive reappraisal	0.43	0.10	4.34(301)	< .001	[0.235, 0.626]
FoMO → Expressive suppression	0.48	0.12	3.94(301)	< .001	[0.239, 0.718]
FoMO → Stress	2.80	0.33	8.42(299)	< .001	[2.143, 3.451]
Cognitive reappraisal → Stress	−0.24	0.21	−1.13(299)	.258	[−0.649, 0.175]
Expressive suppression → Stress	0.68	0.17	3.97(299)	< .001	[0.342, 1.014]
FoMO → Cognitive reappraisal → Stress	−0.10	0.11	—	—	[−0.339, 0.081]
FoMO → Expressive suppression → Stress	0.32	0.12	—	—	[0.117, 0.598]

Table 4: Results of the mediation analysis of the relationship between FoMO and Positive mental health.

Predictor	B	SE	*t*(df)	*p*	95% CI [LLCI, ULCI]
FoMO → Cognitive reappraisal	0.43	0.10	4.34(301)	< .001	[0.235, 0.626]
FoMO → Expressive suppression	0.48	0.12	3.94(301)	< .001	[0.239, 0.718]
FoMO → Positive mental health	−0.67	0.21	−3.24(299)	.001	[−1.073, −0.262]
Cognitive reappraisal → Positive mental health	0.19	0.13	1.47(299)	.143	[−0.065, 0.446]
Expressive suppression → Positive mental health	−0.26	0.11	−2.47(299)	.014	[−0.471, −0.053]
FoMO → Cognitive reappraisal → Positive mental health	0.08	0.06	—	—	[−0.021, 0.225]
FoMO → Expressive suppression → Positive mental health	−0.13	0.07	—	—	[−0.274, −0.020]

Discussion and Conclusion

The results indicate that higher FoMO is associated with poorer mental health. FoMO positively predicted depression, anxiety, and stress, while negatively predicting positive mental health, consistent with previous research (Elhai et al.; Przybylski et al., 2013, 2021). Monitoring others' experiences may increase social comparison and emotional discomfort. The main finding is that expressive suppression mediated all four relationships. Higher FoMO was associated with greater suppression, which related to higher depression, anxiety, and stress, and lower positive mental health, consistent with previous findings (Gross & John, 2003; Dawel et al., 2022). Individuals with higher FoMO may suppress unpleasant emotions arising from social comparison, potentially increasing distress. Contrary to expectations, cognitive reappraisal did not mediate any relationship. Its positive association with FoMO may suggest attempts to reinterpret situations causing discomfort, but its lack of significant associations with the outcomes indicates no protective role in this study. Its adaptive effects may depend on context and use. This study extends understanding of FoMO by examining distress and positive mental health together and identifying expressive suppression as a potential underlying mechanism.

Limitations include the cross-sectional design, which prevents causal conclusions; the predominantly female sample (81%), limiting generalizability; and self-report measures and online convenience sampling, which may introduce response and selection biases.

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How Frequency, Duration, and Intensity of Physical Activity Relate to Mental Health: A Multidomain Analysis

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Abstract

Physical activity is generally associated with better mental health, but frequency, duration, and intensity may convey different information when specific activity types are considered separately. This study examined how 11 physical activity categories, each assessed through frequency, duration, and perceived intensity, relate to four broad symptom dimensions: internalizing, thought disorder, disinhibited externalizing, and regulatory control. Young adults from the general population (N=420) reported activity and symptoms for the previous two weeks. Associations were small but systematic and differed across both activity types and modalities. Longer engagement in strength training showed the most consistently favorable pattern, while higher perceived intensity and, less consistently, higher frequency were sometimes related to elevated symptoms. The findings emphasize that naturalistically chosen PA should be differentiated by activity type and by how often, how long, and how intensely it is performed. When engagement is unusually high relative to what is typical for a given activity, associations with higher psychopathology symptom levels may reflect or reinforce dysregulated patterns such as heightened activation, impulsive persistence, or rigid and compulsive self-regulation, rather than simply indicating a greater protective dose of exercise.

Keywords: physical activity modalities; physical activity types; frequency-duration-intensity; mental health; symptom dimensions

Introduction

Physical activity (PA) is generally associated with favorable mental health (MH). Observational evidence links greater PA with lower distress and depression/anxiety risk (Hamer et al., 2009; Wanjau et al., 2023), while randomized interventions reduce depression, anxiety, and distress (Singh et al., 2023). However, PA components may differ in everyday settings where activity type, frequency, duration, and intensity are self-selected.

Frequency, duration, and intensity are distinct PA attributes. Shannon et al. (2023) found more favorable MH with more frequent muscle-strengthening activity and higher perceived intensity, but not duration. Other studies similarly favor moderate-to-vigorous PA (Coledam et al., 2023; Nakagawa et al., 2020). Collapsing modalities may obscure differences between doing an activity often, longer, or harder.

Naturalistic PA differs from prescribed exercise because activity and effort may be self-selected in relation to symptoms, preferences, barriers, and coping. Psychological distress is associated with barriers such as exhaustion and disorganization (Chapman et al., 2016),

while exercise may become rigid or difficult to control when used to regulate internal discomfort (Sicilia et al., 2020). Accordingly, unusually high engagement may reflect how psychological characteristics shape PA selection and performance, rather than simply more beneficial activity.

This study examined 11 PA categories separately across frequency, duration, and perceived intensity in relation to Internalizing, Thought Disorder, Disinhibited Externalizing, and Regulatory Control symptoms (Forbes et al., 2021). The aim was to determine whether associations with MH differ depending on both how PA is performed, in terms of frequency, duration, and intensity, and the specific type of activity.

Method

Participants and Procedure

The sample comprised 420 young adults from the general population, predominantly from the Republic of Srpska, Bosnia and Herzegovina (61% women; age: *M*=23.48, *SD*=4.81 years). Data were collected through an anonymous online survey, following standard ethical procedures for voluntary participation and participant protection.

Measures

PA and MH ratings covered the previous two weeks. PA was assessed for walking; brisk walking or dog walking; running; cycling; swimming; strength training; cardio training; team sports; individual sports; dance, yoga, or Pilates; and hiking or other outdoor PA. Each activity was rated for Frequency (1 = no days to 5 = 10+ days), Duration (1 = not performed to 6 = 60+ minutes), and perceived Intensity (1 = not performed to 6 = very strenuous).

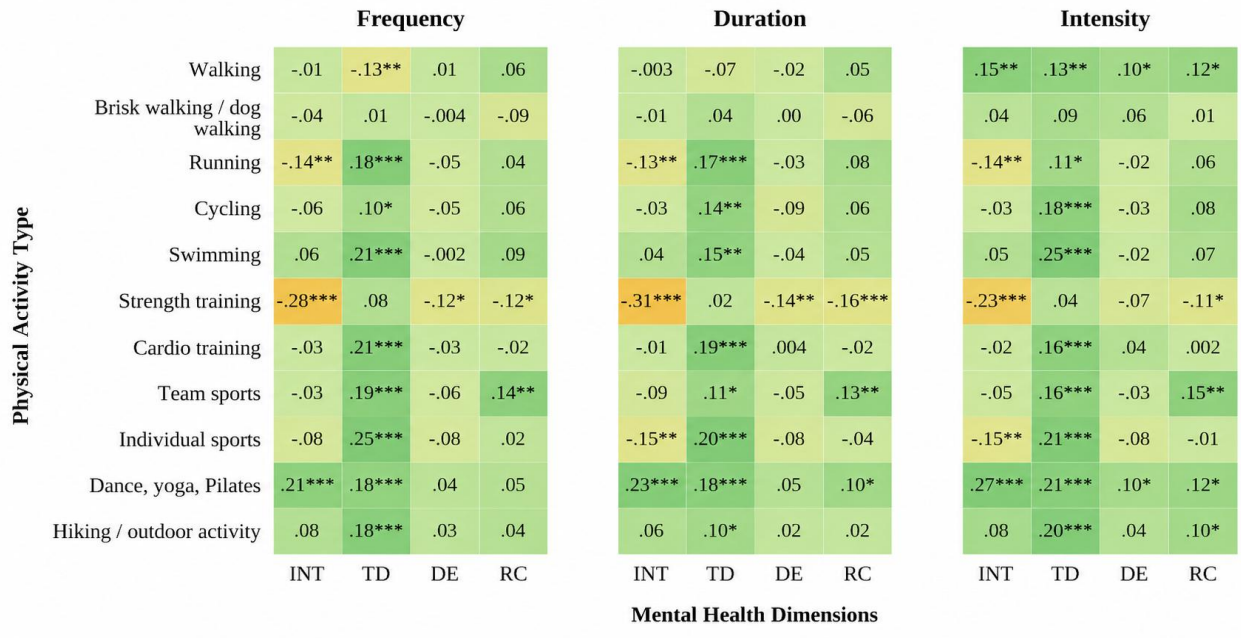
MH symptoms were assessed with an adapted DSM-5-TR-based scale (American Psychiatric Association, 2022; Lugonja Prodanović et al., 2025), rated from 1 = never to 5 = very often. Scoring followed Forbes et al.'s (2021) symptom-level factor-analytic findings and comprised Internalizing (17 items: somatic/panic-GAD anxiety, depression/dysphoria, OCD; α_{ord}=.92; $\bar{r}_{poly}$=.39), Thought Disorder (2 psychosis items; α_{ord}=.78; $\bar{r}_{poly}$=.64), Disinhibited Externalizing (2 irritability/anger items; α_{ord}=.80; $\bar{r}_{poly}$=.67), and Regulatory Control (7 attention, hyperactivity/impulsivity, mania/elevated-activation items; α_{ord}=.79; $\bar{r}_{poly}$=.35). Six eating-pathology/compulsive-exercise items from the adapted scale (Lugonja Prodanović et al., 2025) were excluded to avoid overlap with PA.

Results

At the bivariate level (Figure 1), most associations were small, but their direction and magnitude differed across PA modalities, activity types, and MH domains. Higher symptom levels were most evident for Intensity, particularly for Thought Disorder, whereas Duration showed more negative associations, especially for strength training, swimming, and hiking or outdoor activity. Frequency was generally positive for Thought Disorder and negative for Internalizing.

Fisher-z mean correlations were calculated for each PA modality × MH-domain combination. Thought Disorder showed the strongest associations (mean |*r*|=.21 for Intensity and Frequency; .15 for Duration), followed by Internalizing (mean |*r*|=.09–.11), while Regulatory Control and Disinhibited Externalizing were weaker (mean |*r*|=.05–.08).

Figure 1: Bivariate Polyserial Correlations between Physical Activity Indicators and Mental Health Dimensions.



Notes: INT = Internalizing; TD = Thought Disorder; DE = Disinhibited Externalizing; RC = Regulatory Control; * $p < .05$. ** $p < .01$. *** $p < .001$.

Overall modality totals were strongly interrelated (*r*s=.85, .81, .86, all *p*s<.001). Given this overlap, Bayesian model selection was used to identify the activity-specific PA indicators best supported for each MH domain and their unique associations conditional on other retained predictors (Figure 2). Favorable unique associations were concentrated mainly in Duration, whereas several Frequency and Intensity indicators related to higher symptoms. For Thought Disorder, Duration of swimming, strength training, and hiking or outdoor activity showed negative coefficients despite positive bivariate correlations, indicating lower symptom levels after shared variance with other retained predictors was accounted for.

Figure 2: Regression Predictions of Mental Health According to Bayesian Retention Criteria.

Physical activity indicator	Internalizing	Thought Disorder	Disinhibited Externalizing	Regulatory Control
Model evidence	$F(3, 416) = 18.55$; $p < .001$; $R^2 = .118$; $BF_M = 1379.001$	$F(13, 406) = 10.24$; $p < .001$; $R^2 = .247$; $BF_M = 441447.057$	$F(1, 418) = 5.51$; $p = .019$; $R^2 = .013$; $BF_M = 7.319$	$F(2, 417) = 8.01$; $p < .001$; $R^2 = .037$; $BF_M = 58.598$
Frequency				
Walking		-.15 (<.001)		
Strength training		.30 (.009)		
Cardio training		.10 (.021)		
Individual sports		.09 (.040)		
Hiking or outdoor physical activity		.21 (.006)		
Duration				
Walking		-.09 (.064)		
Swimming		-.29 (<.001)		
Strength training	-.25 (<.001)	-.33 (.003)	-.11 (.019)	-.16 (.001)
Dance, yoga, or Pilates		.13 (.004)		
Hiking or outdoor physical activity		-.32 (.003)		
Intensity				
Walking	.11 (.019)	.16 (<.001)		
Swimming		.40 (<.001)		
Team sports				.12 (.010)
Dance, yoga, or Pilates	.19 (<.001)			
Hiking or outdoor physical activity		.21 (.013)		

Notes: β = standardized regression coefficient for predictors retained by the Bayesian criterion; values in parentheses are *p*-values; BF_M = model Bayes factor, quantifying evidence for the retained model relative to the remaining model space; R^2 = proportion of criterion variance explained.

Discussion

The findings support a multidomain rather than simple more-is-better view of PA. Despite strong modality overlap, activity-specific associations differed. The clearest favorable unique pattern involved Duration, especially strength training, partly converging with resistance-exercise benefits (Singh et al., 2023). Shannon et al. (2023), however, found more favorable muscle-strengthening relations for Frequency and Intensity than Duration. Direct comparison is limited by design and operationalization, as we assessed naturally chosen behavior across multiple activity types.

Intensity requires particular caution. Moderate and vigorous PA are often associated with better MH and can be advantageous in structured interventions (Coledam et al., 2023; Nakagawa et al., 2020; Singh et al., 2023), so the present findings do not imply that vigorous exercise is harmful. In naturalistic settings, however, perceived Intensity also reflects how an activity is performed, ranging from controlled effort to unusually forceful, rigid, or exhausting execution.

More broadly, activities performed in a markedly excessive manner relative to what is typical for that activity, whether in Frequency, Duration, or Intensity, may be informative of, or potentially reinforce, dysregulated cognitive-affective processes such as heightened activation, impulsive persistence, rigid self-control, compulsive goal pursuit, or regulation of distress through exertion. Exercise-addiction research is compatible with this possibility, as exercise may relieve internal discomfort while becoming difficult to control and associated with psychological or interpersonal costs (Sicilia et al., 2020). The issue is therefore the style and function of self-selected activity, not high levels of any PA modality per se.

Naturalistic and intervention findings may therefore diverge. In interventions, PA dose is prescribed and structured, whereas in everyday life it is self-selected and

may reflect current psychological states. Psychological distress is associated with barriers including poor mental health, tiredness, disorganization, and exhaustion (Chapman et al., 2016), while longer controlled engagement may reflect greater behavioral stability or adherence. These possibilities cannot be distinguished cross-sectionally.

Limitations of this study include reliance on self-report, particularly retrospective PA estimates. Participants with higher psychopathology may recall or evaluate recent activity differently, introducing symptom-related reporting bias. The young, student-heavy sample also limits generalizability. Longitudinal research combining objective tracking with self-report could help distinguish adaptive high engagement from maladaptive self-regulation. Overall, Frequency, Duration, and Intensity convey distinct MH information across activity types and symptom domains.

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Associations Between Basic Personality Dimensions and Coping Styles, Depression, Anxiety, and Stress Among University Students

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Abstract

The aim of this study was to examine the associations between the basic personality dimensions of the Five-Factor Model and preventive and proactive coping, as well as depression, anxiety, and stress. The sample comprised 366 participants (291 women and 75 men), aged 18 to 30 years. The NEO Five-Factor Inventory (NEO-FFI), the Proactive and Preventive Coping Inventory, and the Depression Anxiety Stress Scales (DASS-21) were administered. The results of the regression analyses showed that conscientiousness was a significant predictor of preventive coping, whereas proactive coping was predicted by lower neuroticism, higher extraversion, openness, and conscientiousness, as well as lower agreeableness. Neuroticism emerged as the strongest predictor of depression, anxiety, and stress, whereas conscientiousness showed a protective role against depression, while extraversion and agreeableness were protective against stress. The findings confirm the importance of basic personality dimensions in explaining coping strategies and psychological distress, highlighting their relevance for understanding adaptive functioning in young adults.

Keywords: Five-Factor Model of personality; preventive and proactive coping; depression; anxiety; stress.

Introduction

Mental health among university students is an important topic in contemporary psychological research, as university education involves numerous academic, social, and personal challenges. Academic demands, adjustment to new roles, uncertainty about the future, and increased responsibility may represent significant sources of stress and affect psychological functioning. Understanding factors that promote effective coping and mental health is therefore essential. Research indicates that personality traits and coping strategies are important determinants of psychological well-being and psychological distress (McCrae & Costa, 1991; Steel et al., 2008).

The Five-Factor Model of personality (Big Five) is one of the most influential frameworks for studying individual differences and comprises five basic dimensions: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (McCrae & Costa, 1991). Neuroticism is associated with negative emotionality and greater stress sensitivity, whereas extraversion, agreeableness, and conscientiousness are generally related to better social adjustment, self-regulation, and psychological well-being. Openness to experience reflects intellectual curiosity, cognitive flexibility, and receptiveness to new ideas and experiences (DeNeve & Cooper, 1998; Lamers et al., 2012).

Coping strategies are also important for psychological functioning. While traditional approaches have focused primarily on responses to existing stressors, contemporary models emphasize future-oriented coping. Schwarzer and colleagues introduced the concepts of proactive and preventive coping, referring to active preparation for future challenges and potential stressors (Schwarzer & Taubert, 2002). Proactive coping involves goal setting, developing personal resources, and taking initiative to address future challenges, whereas preventive coping involves identifying potential risks and preparing to overcome them. Both strategies are future-oriented and involve developing personal resources that enhance perceived control, reduce uncertainty, and facilitate adaptation (Greenglass et al., 1999; Schwarzer, 2002).

The interplay between personality and coping is particularly relevant to depression, anxiety, and stress, which are common forms of psychological distress among young adults and may impair academic, social, and personal functioning (Lovibond & Lovibond, 1995). Research consistently links neuroticism to greater psychological distress, while conscientiousness, extraversion, and agreeableness may have protective effects (DeNeve & Cooper, 1998; Steel et al., 2008). However, relatively few studies have simultaneously examined personality as a predictor of proactive and preventive coping and multiple forms of psychological distress among university students. Therefore, the present study examined whether the basic dimensions of the Five-Factor Model predict proactive and preventive coping, as well as depression, anxiety, and stress. By integrating personality and future-oriented coping, the study seeks to contribute to understanding the psychological mechanisms underlying adaptation and mental health among young adults.

Method

Participants

The study was conducted on a sample of university students in Serbia. The sample comprised 366 participants, of whom 291 were women and 75 were men, aged 18 to 30 years (M=23.74, SD=4.37).

Procedure

The study was conducted using an online questionnaire, which students completed voluntarily after being informed that all collected data would remain anonymous and confidential. Participants were recruited using convenience sampling, with the questionnaire link distributed through social media and student groups.

The following instruments were used in the study:

NEO Five-Factor Inventory (NEO-FFI) (McCrae & Costa, 1989), which assesses the five basic personality dimensions within the Five-Factor Model: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. The inventory consists of 60 items rated on a five-point Likert scale (Knežević, Ignjatović-Džamonja, & Đurić-Jočić, 2004).

Proactive and Preventive Coping Scale (Greenglass et al., 1999; Đorđević & Greenglass, 2006; Станојевић, 2023), assesses two future-oriented coping strategies. The Proactive Coping Scale consists of 13 items, whereas the Preventive Coping Scale consists of 10 items. Participants respond using a four-point Likert scale.

Depression Anxiety Stress Scales (DASS-21) (Lovibond & Lovibond, 1995), which consists of 21 items and three subscales: depression, anxiety, and stress. Participants rate the frequency of symptoms on a scale ranging from 0 to 3. The instrument has been validated in the Serbian-speaking population and has demonstrated satisfactory psychometric properties (Jovanović et al., 2014).

Results and discussion

Descriptive statistics for all variables included in the study are presented in Table 1.

Table 1: Descriptive Statistics of the Study Variables.

Variable	*M*	*SD*	α
Preventive coping	28.36	5.58	.749
Proactive coping	43.45	5.99	.832
Depression	5.86	5.38	.892
Anxiety	7.42	5.74	.884
Stress	10.80	5.34	.861
Neuroticism	34.65	9.29	.842
Extraversion	37.30	6.52	.655
Openness	37.81	6.07	.552
Conscientiousness	45.19	7.18	.792
Agreeableness	40.67	6.38	.636

The results of the multiple regression analyses are presented in Table 2.

The multiple regression analyses showed that conscientiousness was a significant positive predictor of preventive coping. For proactive coping, neuroticism and agreeableness were significant negative predictors, whereas extraversion, openness, and conscientiousness were significant positive predictors. Neuroticism was a significant positive predictor of depression, while conscientiousness was a significant negative predictor.

Regarding anxiety, neuroticism was identified as a significant positive predictor. Finally, neuroticism was a significant positive predictor of stress, whereas extraversion and agreeableness were significant negative predictors.

Table 2: Personality Traits as Predictors of Coping Styles, Depression, Anxiety, and Stress.

	Preventive coping	Proactive coping	Depression	Anxiety	Stress
N	.053	**-.139****	**.332****	**.398****	**.333****
E	-.032	**.192****	.025	.064	**-.102****
O	.022	**.135****	.024	.061	.012
C	**.258****	**.356****	**-.146****	-.025	.058
A	-.039	**-.128****	-.052	-.041	**-.077***
R^2	.09	.43	.48	.42	.40
$F_{(5,360)}$	7.210	55.159	68.244	52.890	49.628

Note. β – standardized regression coefficients.
$^{*}p<.05$; $^{**}p<.01$

Zero-order correlations between the predictor and criterion variables are presented in Table 3.

Table 3: Zero-Order Correlations Between Predictor and Criterion Variables.

	Preventive coping	Proactive coping	Depression	Anxiety	Stress
N	-.044	-.470**	.671**	.642**	.622**
E	.017	.413**	-.292**	-.233**	-.371**
O	.032	.118*	.068	.106*	.061
C	.277**	.555**	-.478**	-.332**	-.261**
A	.016	.046	-.262**	-.218**	-.235**

Note. $^{*}p<.05$; $^{**}p<.01$

The results confirm that basic personality dimensions significantly predict both future-oriented coping and psychological distress among university students. Conscientiousness was the only significant predictor of preventive coping, suggesting that organized, disciplined, and planning-oriented individuals are more likely to engage in behaviors aimed at preventing potential stressors. This finding is consistent with research linking conscientiousness to self-regulation, planning, and adaptive coping (Connor-Smith & Flachsbart, 2007).

Proactive coping was positively predicted by extraversion, openness, and conscientiousness, and negatively by neuroticism and agreeableness. Socially active, open, and goal-oriented individuals may be more likely to develop resources for future challenges, whereas neuroticism may hinder proactive coping through greater worry and negative expectations. These findings support models emphasizing personal resources, self-efficacy, and positive future orientation (Greenglass et al., 1999; Schwarzer & Taubert, 2002). The negative association with agreeableness may suggest that individuals focused on interpersonal harmony are less likely to display the assertiveness and initiative involved in actively shaping future circumstances.

Neuroticism emerged as the strongest predictor of depression, anxiety, and stress, supporting its role as a major risk factor for psychological distress (Lahey, 2009; Steel et al., 2008). Conscientiousness showed a protective effect against depression, consistent with the importance of self-discipline and self-regulation for mental health (Kotov

et al., 2010). Extraversion and agreeableness negatively predicted stress, suggesting that social engagement, positive affectivity, and supportive interpersonal relationships may reduce stress.

Overall, personality traits explained a substantial proportion of variance in coping and psychological distress, particularly proactive coping and symptoms of depression, anxiety, and stress. These findings support the relevance of the Five-Factor Model for understanding individual differences in student adaptation and highlight the potential value of personality assessment in promoting adaptive coping and mental health.

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We're All Just Two Bad Scores Away from Wreckage: How Personality Traits Predict Driving Behaviors

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Abstract

Traffic accidents remain a critical public health and societal issue in Bosnia and Herzegovina (B&H), highlighting the importance of understanding factors associated with risky driving. The study examined links between personality, sensation seeking, driving styles, and traffic safety. The study included 112 adult drivers from B&H who completed measures of sensation seeking, personality traits, driving styles, and driving-related characteristics. Personality traits and sensation seeking were associated with most driving styles. Adaptive driving styles were primarily associated with Conscientiousness and Open-Mindedness, whereas maladaptive styles showed broader associations with personality traits, sensation seeking, mileage, and gender. Lower Agreeableness was associated with Risky, Angry, and High-Velocity driving, while higher sensation seeking was associated with Risky driving. Angry driving was also associated with more reported traffic accidents, particularly among men. The findings highlight the relevance of personality and sensation seeking for understanding driving styles and informing targeted road-safety interventions.

Keywords: sensation seeking; driving styles; personality traits; risky driving behavior

Introduction

Traffic accidents represent a major global public health and societal problem, resulting in more than 1.16 million deaths each year (World Health Organization, 2026). In B&H, 35,854 traffic accidents were recorded in 2024, resulting in 222 fatalities and 11,300 injuries (Bosanskohercegovački auto-moto klub, 2025). While environmental and vehicle-related factors influence traffic accidents, driver-related characteristics contribute to individual differences in risky driving, including demographic characteristics, driving experience, personality traits, and sensation seeking (Hu et al., 2016; Mahdian et al., 2015; Spillane et al., 2012).

Sensation seeking (SS) refers to the tendency to seek novel, varied, and intense experiences despite the risks (Arnett, 1994; Zuckerman, 1979). Higher SS is linked to risky driving behaviors such as speeding, dangerous driving, alcohol-impaired driving, and not using seat belts (Bachoo et al., 2013; Delhomme et al., 2012; Jonah et al., 2001). It is also generally higher among younger people and men (Dhami & Garcia-Retamero, 2012; Spillane et al., 2012).

Basic personality traits may also influence driving behavior. Lower Agreeableness and Conscientiousness have been linked to more frequent risky, aggressive, and maladaptive driving behaviors (Akbari et al., 2019; Luo et al., 2023), whereas associations with Extraversion and Open-Mindedness have been less consistent (Akbari et al., 2019; Luo et al., 2023).

Personality traits and SS may be expressed through relatively stable patterns of behavior while driving, commonly referred to as driving styles, which include characteristic patterns of speed, attention, emotional responses, and adherence to traffic norms (Taubman-Ben-Ari & Yehiel, 2012; Taubman-Ben-Ari et al., 2004). They can range from adaptive patterns, such as careful and patient driving, to maladaptive patterns characterized by risky, angry, or high-velocity behavior. Despite evidence linking SS and personality to driving behavior, less is known about these associations among drivers in B&H. This study examined the relationships between SS, basic personality traits, and eight driving styles. Gender differences and associations with driving-related characteristics (monthly mileage, traffic accidents, and violations) were also examined.

Method

Participants and Procedure

The sample consisted of 112 adult drivers from B&H (M_{age} = 27.77, *SD* = 9.54; 62% female). Eligible participants held a valid driver's license and had driven in the preceding 12 months. Data were collected anonymously via the 1KA platform, covering demographic and driving-related characteristics, sensation seeking, personality traits, and driving styles.

Measures

Sensation Seeking was assessed using the Arnett Inventory of Sensation Seeking (AISS; Arnett, 1994), consisting of 20 items measuring the tendency to seek novel and intense experiences.

Personality Traits were assessed using the Big Five Inventory-2-Extra Short Form (BFI-2-XS; Soto & John, 2017), comprising 15 items measuring Extraversion (E), Agreeableness (A), Conscientiousness (C), Negative Emotionality (N) and Open-Mindedness (O).

Driving Styles were assessed using the Multidimensional Driving Style Inventory (MDSI; Taubman-Ben-Ari et al., 2004), containing 44 items covering five maladaptive (Risky, Angry, High-Velocity, Anxious and Dissociative) and three adaptive (Careful, Patient and Distress-Reduction) styles.

Driving-related characteristics included age, gender, driving experience, licence category, average monthly mileage, and history of traffic violations and accidents.

Data Analysis

Data were analyzed using independent-samples *t*-tests to examine gender differences and hierarchical linear regression to assess the additional contribution of personality traits and SS beyond demographic and driving-related characteristics entered in the first block. A Poisson generalized linear model examined the number of reported traffic accidents.

Results

Gender differences emerged for several driving styles, personality traits, and total SS. Men reported higher Risky, Angry, and High-Velocity driving and SS, whereas women reported higher Agreeableness, Negative Emotionality, and Patient driving, with the largest difference observed for SS (Table 1).

Hierarchical regression analyses showed that adding personality traits and SS significantly improved six of eight MDSI models (ΔR^2 = .052–.218, *p*s < .01), but not Anxious or Distress-Reduction driving.

Adaptive styles were primarily associated with Conscientiousness and Open-Mindedness, whereas maladaptive styles showed broader associations with personality traits, SS Intensity, mileage, and gender (Table 2).

Table 1: Gender Differences in Study Variables.

Variable	*t*	*df*	Cohen's *d*
Dissociative	−0.02	110	−0.00
Anxious	−1.58	110	−0.31
Risky	4.07***	73.01	0.84
Angry	4.25***	110	0.82
High-velocity	4.14***	75.22	0.85
Total AISS	5.65***	110	1.09
A	−3.92***	110	−0.76
N	−3.45***	110	−0.66
Distress reduction	0.78	110	0.15
Patient	−2.39*	110	−0.46
Careful	−0.78	110	−0.15

Note. *t* = test statistic; *df* = degrees of freedom; *p < .05, **p < .01, ***p < .001. Welch's *t*-test was used for risky driving and high-velocity driving because the assumption of homogeneity of variance was violated

Risky driving correlated positively with SS, particularly Intensity. Maladaptive styles generally correlated negatively with Agreeableness, Conscientiousness and Open-Mindedness, while SS correlated negatively with Agreeableness and Conscientiousness and positively with Extraversion. Risky, Angry, and High-Velocity driving were positively associated with mileage and accidents, while SS Intensity was positively associated with mileage (Table S1).

Angry driving significantly predicted more reported traffic accidents, β = .56, *SE* = .13, z = 4.40, p < .001, IRR = 1.76, 95% CI [1.37, 2.27]. An exploratory analysis suggested a stronger association among men (Angry driving × gender: β = −.41, *SE* = .21, *z* = −1.97, *p* = .049).

Discussion

The findings indicate that personality traits and sensation seeking are differentially associated with driving styles. Higher Negative Emotionality was associated with Angry and Dissociative driving, consistent with previous research linking neuroticism to more frequent driving violations (Endriulaitienė et al., 2013), whereas higher Extraversion was associated with High-Velocity driving, adding to mixed evidence regarding Extraversion and driving behavior (Akbari et al., 2019; Luo et al., 2023; Stephens, 2011). Gender differences were consistent with previous findings of higher sensation seeking and greater involvement in risky and aggressive driving among men (Constantinou et al., 2011; Dhami & Garcia-Retamero, 2012). Importantly, Angry driving was associated with more reported traffic accidents, particularly among men, further indicating the relevance of maladaptive driving styles for traffic safety.

The cross-sectional design limits causal conclusions. Future studies should examine these relationships longitudinally and incorporate objective driving indicators, such as telematics or accident records.

Table 2: Hierarchical Regression Models of Driving Styles.

Driving style	R^2 (M_0)	R^2 (M_1)	ΔR^2	$F(10, 101)$	Significant predictor (M_1)	β
Dissociative	.059	.196**	.138**	2.469	↓ C	−.19*
					↑ N	.25*
Anxious	.059	.146	.087	1.730	No significant predictors	—
Risky	.284***	.479***	.195***	9.283	↑ AISS Intensity	.28**
					↓ A	−.28***
					Higher Mileage	.25**
Angry	.183***	.361***	.177***	5.695	↓ A	−.38***
					↑ N	.19*
					Male gender	−.24*
High-Velocity	.273***	.491***	.218***	5.218	↓ A	−.35***
					↓ C	−.28***
					↑ E	.27***
					Higher Mileage	.27***
					Male gender	−.22**
Distress-Reduction	.104*	.156	.052	1.865	Higher Mileage	.30**
Patient	.214***	.354**	.140**	5.539	↑ C	.31***
					Higher Mileage	−.29***
					Driving Experience	−.27*
Careful	.113*	.256**	.143**	3.475	↑ O	.27**

Note. M_0 = demographic and driving-related characteristics; M_1 = M_0 plus personality traits and SS; ΔR^2 = change in explained variance from M_0 to M_1; β = standardized regression coefficient. $^*p < .05$. $^{**}p < .01$. $^{***}p < .001$.

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Supplementary Material

Table S1: Pearson Correlations Among Study Variables.

Variable														
O														
C	.12													
E	.14	.16												
A	.22*	.18	.06											
N	−.04	−.01	−.19*	.21*										
Novelty	.23*	−.09	.33***	−.12	−.03									
Intensity	−.10	−.27**	.26**	−.32***	−.09	.51***								
Dissociative	−.26**	−.23*	−.05	−.18	.21*	.10	.09							
Anxious	.04	.07	−.16	.18	.13	−.15	−.30**	.28**						
Risky	−.26**	−.27**	.03	−.46***	−.00	.23*	.52***	.43***	−.30**					
Angry	−.16	−.23*	.08	−.47***	.01	.15	.30**	.26**	−.10	.46***				
High-Velocity	−.21*	−.34***	.15	−.47***	−.07	.10	.31***	.25**	−.15	.53***	.76***			
Distress-Reduction	.05	−.05	.10	−.09	.00	.08	.06	.28**	−.03	.33***	.22*	.25**		
Patient	.26**	.36***	.00	.27**	.13	−.05	−.16	−.23*	.02	−.44***	−.41***	−.50***	−.06	
Careful	.38***	.24**	.13	.27**	.04	.01	−.14	−.41***	.02	−.55***	−.28**	−.32***	−.07	.42***

Note. Values are Pearson's r. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Original Scientific Paper
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The Relationship Between Grandiose and Vulnerable Narcissism and HEXACO Personality Dimensions in High School Adolescents

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Abstract

Distinguishing grandiose and vulnerable narcissism may improve understanding of personality correlates of narcissism in adolescence. This study examined associations between grandiose and vulnerable narcissism and HEXACO traits in 232 Serbian high school students aged 15–18 years who completed the Pathological Narcissism Inventory and the HEXACO-60. Grandiose narcissism was linked to higher Extraversion and Openness and lower Honesty–Humility, whereas vulnerable narcissism was associated with higher Emotionality and lower Honesty–Humility, Agreeableness, Conscientiousness, and Extraversion. Both forms shared low Honesty–Humility, consistent with a common antagonistic component. The pattern largely mirrors findings from adult samples and shows that the two forms of narcissism have distinct personality correlates already in adolescence. These findings highlight the importance of distinguishing grandiose and vulnerable narcissism when examining personality traits in adolescence and underscore the value of assessing both dimensions during this developmental period.

Keywords: grandiose narcissism; vulnerable narcissism; HEXACO; adolescence; socioemotional functioning

Introduction

Narcissism is commonly viewed as a multidimensional personality construct that includes both grandiose and vulnerable forms (Dickinson & Pincus, 2003; Wink, 1991). Grandiose narcissism is typically associated with dominance, self-confidence, entitlement, and admiration seeking, whereas vulnerable narcissism is characterized by insecurity, hypersensitivity to criticism, emotional instability, and social withdrawal. Although these two forms differ in emotional and interpersonal functioning, contemporary models suggest that they share a common antagonistic core reflected in entitlement and reduced concern for others.

Adolescence may be an especially important developmental period for examining narcissistic traits. During this stage, identity formation, peer evaluation, and social comparison become increasingly important, which may contribute to the expression of narcissistic tendencies. While narcissism has been extensively studied in adult populations, considerably less attention has been given to grandiose and vulnerable narcissism in adolescents (Chrétien et al., 2018), particularly using multidimensional measures such as the Pathological Narcissism Inventory (PNI; Pincus et al., 2009).

The HEXACO personality model (Ashton & Lee, 2007) may provide a useful framework for understanding personality correlates of narcissism in adolescence. Previous research conducted mostly on adult samples has consistently linked narcissistic traits to lower Honesty–Humility (Dinić & Vujić, 2019), reflecting entitlement, manipulativeness, and exploitativeness. At the same time, grandiose and vulnerable narcissism appear to demonstrate different relationships with dimensions such as Extraversion, Emotionality, and Conscientiousness. However, studies examining these associations in adolescent samples remain relatively limited (Chrétien et al., 2018).

Examining narcissism during adolescence may contribute to a better understanding of socioemotional functioning and maladaptive interpersonal tendencies during this developmental period. In addition, research on adolescent samples remains relatively scarce (Chrétien et al., 2018). Accordingly, the aim of the present study was to examine the relationships between grandiose and vulnerable narcissism and HEXACO personality dimensions in Serbian high school adolescents.

Method

Participants and procedure

Participants were 232 high school students recruited from three secondary schools in Belgrade, Serbia. The sample included adolescents aged between 15 and 18 years (M = 16.1), with 52% male participants. Data were collected using a convenience sampling procedure during regular school classes, with prior approval obtained from school administrations and professional services. Participation was voluntary and anonymous. Gender differences in grandiose and vulnerable narcissism were also examined to explore potential sex-related variation in narcissistic traits.

Measures

Pathological Narcissism Inventory (PNI)

Pathological narcissism was assessed using the Serbian adaptation of Pathological Narcissism Inventory (PNI; Dinić & Vujić, 2019; Pincus et al., 2009), a self-report instrument designed to measure grandiose and vulnerable dimensions of pathological narcissism. The inventory provides separate scores for grandiose and vulnerable narcissism and has demonstrated good internal consistency in previous studies, as well as in the present sample (α = .89 for grandiose; α = .91 for vulnerable).

HEXACO-60

Basic personality traits were assessed using the HEXACO-60 inventory (Ashton & Lee, 2009; Sokolovska et al., 2018), which measures six personality dimensions: Honesty–Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience. The HEXACO model represents an extension of the Five-Factor Model with the addition of the Honesty–Humility dimension (Ashton & Lee, 2007). Items were rated on a 5-point Likert scale. Internal consistency coefficients for the six dimensions ranged from α = .69 to α = .75.

Results

Pearson correlations between grandiose narcissism and vulnerable narcissism, and HEXACO personality dimensions are presented in Table 1.

Table 1: Correlations Between HEXACO Dimensions and Narcissism Dimensions.

	Grandiose narcissism	Vulnerable narcissism
Honesty–Humility	–.42***	–.34***
Emotionality	.05	.23***
Extraversion	.16*	–.14*
Agreeableness	–.08	–.15*
Conscientiousness	–.06	–.28***
Openness	.26***	.04

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

Grandiose narcissism showed a moderate negative association with Honesty–Humility and positive associations with Extraversion and Openness. Vulnerable narcissism was negatively associated with Honesty–Humility, Extraversion, Agreeableness, and Conscientiousness, while showing a positive association with Emotionality (see Table 1). Overall, both forms of narcissism shared low Honesty–Humility as a common correlate, whereas vulnerable narcissism exhibited a broader pattern of associations with emotional and interpersonal personality dimensions.

Gender differences were examined using ANOVA. Results indicated significantly higher scores for both grandiose and vulnerable narcissism among female participants compared to males, although the effect sizes were small (see Table 2).

Table 2: Gender Differences in Grandiose and Vulnerable Narcissism.

	Gender	*M*	*SD*	*F*(1, 230)	η²
Grandiose narcissism	Male	51.71	12.01	4.95*	.02
	Female	55.25	11.66		
Vulnerable narcissism	Male	88.64	22.91	5.09*	.02
	Female	95.78	24.20		

Note: * p< .05.

Discussion

The present study examined the relationships between grandiose and vulnerable narcissism and HEXACO personality traits in Serbian high school adolescents. Overall, the findings suggest that the two forms of narcissism show distinct personality patterns, despite sharing some common antagonistic characteristics.

Grandiose narcissism was associated with higher Extraversion and Openness, as well as lower Honesty–Humility. This pattern is consistent with the socially dominant, agentic, and self-enhancing characteristics commonly associated with grandiose narcissism. In contrast, vulnerable narcissism showed a broader pattern of associations, including higher Emotionality and lower Extraversion, Agreeableness, and Conscientiousness. Thus, vulnerable narcissism was related to a wider range of emotional, interpersonal, and self-regulatory personality dimensions in the present sample.

Importantly, both forms of narcissism were negatively related to Honesty–Humility, supporting the idea that grandiose and vulnerable narcissism share a common antagonistic component. This finding is broadly consistent with previous research linking narcissism to low Honesty–Humility and antagonistic interpersonal characteristics (Dinić & Vujić, 2019). The distinct associations of grandiose and vulnerable narcissism with other HEXACO dimensions are also consistent with theoretical and empirical distinctions between the two forms of narcissism (Dickinson & Pincus, 2003; Pincus et al., 2009).

The findings may be particularly relevant given that adolescence is marked by increased peer evaluation, social comparison, and identity formation. Understanding narcissistic traits during this period may therefore contribute to earlier recognition of maladaptive interpersonal and emotional patterns.

Several limitations should be noted. The cross-sectional design does not allow causal conclusions. Additionally, the convenience sample limits the generalizability of the findings. Future research could examine developmental changes in narcissistic traits as well as the role of peer relationships and social media exposure during adolescence. Despite these limitations, the present findings contribute to a better understanding of the distinct personality correlates of grandiose and vulnerable narcissism in adolescents.

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Relations Between Dark Triad Traits and HEXACO Personality Dimensions in High School Adolescents

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Abstract

Adolescence is a developmental period marked by substantial socio-emotional change, identity formation, and increasingly complex interpersonal relationships. The present study examined associations between the Dark Triad traits—Machiavellianism, psychopathy, and narcissism—and the six personality dimensions of the HEXACO model among high school adolescents. A sample of 232 students from public high schools in Belgrade completed measures of Dark Triad traits and HEXACO personality dimensions. All three Dark Triad traits were negatively associated with Honesty–Humility and Agreeableness, indicating a common antagonistic component. Distinct patterns were also observed: narcissism was positively associated with Extraversion, whereas Machiavellianism and psychopathy were negatively associated with Emotionality. Psychopathy additionally showed negative associations with Conscientiousness and Openness to Experience. Overall, the observed pattern was broadly consistent with associations previously reported in adult samples, while also indicating meaningful differences among the three Dark Triad traits during adolescence.

Keywords: Dark Triad; HEXACO; personality; adolescents; antagonism

Introduction

Adolescence involves substantial socio-emotional development, identity formation, and changing interpersonal relationships. Peer influence, social competition, status concerns, and increasing autonomy may provide an important context for the expression of socially aversive personality traits.

The Dark Triad comprises three related but distinct traits: Machiavellianism, psychopathy, and narcissism (Paulhus & Williams, 2002). Machiavellianism involves strategic manipulation and cynical interpersonal beliefs; psychopathy involves callousness, impulsivity, and reduced concern for others; narcissism is characterized by grandiosity, entitlement, and a need for admiration (Paulhus & Williams, 2002).

Mapping Dark Triad traits onto broad personality models clarifies their common and distinctive characteristics. The HEXACO model distinguishes Honesty–Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience (Lee & Ashton, 2005). Honesty–Humility is particularly relevant because its low pole reflects tendencies toward exploitation, entitlement, and insincerity (Ashton & Lee, 2007).

Research in adults has identified low Honesty–Humility and Agreeableness as important common correlates of the Dark Triad, while other HEXACO dimensions show trait-specific patterns of association (Lee & Ashton, 2005; Muris et al., 2017). Narcissism tends to be positively associated with Extraversion, whereas psychopathy is related to lower Conscientiousness. Less is known about whether comparable patterns occur among high school adolescents (Muris et al., 2022).

The present study examined associations between the three Dark Triad traits and the six HEXACO dimensions in high school students. It was expected that all three traits would be negatively associated with Honesty–Humility and Agreeableness, narcissism positively with Extraversion, and psychopathy negatively with Conscientiousness and Emotionality, while associations with the remaining HEXACO dimensions were examined exploratorily (Muris et al., 2022).

Method

Participants and Procedure

The sample consisted of 232 high school students (N = 232) recruited from three public high schools in Belgrade, Serbia. Participants ranged from 15 to 18 years of age (M = 16.10). The sample included 121 male students (52%) and 111 female students (48%). Convenience sampling was used. Data were collected in person during regular school classes under the supervision of school administrators. Participation was voluntary and anonymous, and the study was conducted with appropriate institutional consent and ethical oversight.

Measures

Dark Triad traits were assessed using the Serbian adaptation of the Short Dark Triad (SD3; Dinić et al., 2018; Jones & Paulhus, 2014). The instrument contains 27 items, with nine items assessing each of Machiavellianism, psychopathy, and narcissism. Responses were recorded on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Internal consistency coefficients in the present sample were satisfactory for Machiavellianism (α = .74), psychopathy (α = .71), and narcissism (α = .77).

HEXACO personality dimensions were assessed using the Serbian adaptation of the HEXACO-60 (Ashton & Lee, 2009; Sokolovska et al., 2018) consisting of 60

items measuring Honesty–Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience. Items were rated on a 5-point Likert scale. Internal consistency coefficients for the six dimensions ranged from α = .69 to α = .75.

Results

Pearson product–moment correlations were calculated to examine associations between the three Dark Triad traits and the six HEXACO dimensions. Results are presented in Table 1.

The hypothesized associations were supported. All three Dark Triad traits showed negative associations with Honesty–Humility and Agreeableness. Narcissism was positively associated with Extraversion, whereas psychopathy was negatively associated with Conscientiousness and Emotionality (see Table 1).

Beyond the hypothesized associations, Machiavellianism was negatively associated with Emotionality, and Psychopathy was additionally negatively associated with Openness to Experience (see Table 1).

Table 1: Correlations Between Dark Triad Traits and HEXACO Personality Dimensions.

	Machiavellianism	Psychopathy	Narcissism
Honesty–Humility	−.43***	−.49***	−.45***
Emotionality	−.14*	−.17*	−.09
Extraversion	−.06	.04	.28***
Agreeableness	−.30***	−.27***	−.26***
Conscientiousness	−.09	−.21***	.03
Openness to Experience	−.03	−.23***	−.04

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

Discussion and Conclusions

The findings indicate a common pattern of low Honesty–Humility and Agreeableness across the three Dark Triad traits, consistent with research identifying low Honesty–Humility and antagonistic interpersonal tendencies as common features of the Dark Triad (Lee & Ashton, 2005; Muris et al., 2017). The hypothesized trait-specific associations were also supported: narcissism was positively related to Extraversion, whereas psychopathy was negatively related to Conscientiousness and Emotionality. Beyond these hypothesized associations, Machiavellianism was negatively associated with Emotionality, and psychopathy was also negatively associated with Openness to Experience.

The additional associations should be interpreted as exploratory findings rather than as confirmation of a priori hypotheses. In particular, the negative association of Machiavellianism with Emotionality and the negative association of psychopathy with Openness to Experience may provide directions for future research, but replication is needed before drawing stronger conclusions about these relationships in adolescents.

These cross-sectional findings do not demonstrate that the Dark Triad structure is developmentally "fully established" during adolescence. Instead, the observed pattern was broadly similar to findings reported in adults (Lee & Ashton, 2005).

The findings may have practical relevance for psychological research and practice, particularly for understanding antagonistic interpersonal patterns. Assessment should be used to understand behavioral tendencies rather than to label adolescents. These findings may have implications for educational approaches aimed at supporting empathy and cooperative behaviour, although such applications require evaluation in intervention studies. Future research should use larger, representative samples, longitudinal designs, and multi-method assessments to clarify developmental changes.

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"You Did [X], Now I'll Spank Your Ass": Parental Reasons for Endorsing Corporal Punishment of Children

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Abstract

Corporal punishment (CP) remains socially recognizable as a disciplinary response despite consistent evidence of detrimental child outcomes. This study examined how parents judge the situational justifiability of CP across a broad range of child behaviors and how these judgments relate to broader beliefs and personal experience. Parents evaluated 40 behaviors spanning danger, aggression, rule-breaking, defiance, everyday social difficulties, and developmentally typical conduct, and also reported their general attitudes toward CP, childhood CP exposure, and current CP use. Overall situational CP endorsement was low, but judgments followed a clear pattern: dangerous and aggressive behaviors, persistent disobedience, and deliberate violations were viewed as relatively more deserving of CP, whereas accidental, routine, and developmentally typical behaviors were rarely endorsed. The behavior ratings formed a coherent common dimension, which correlated most strongly with general approval of CP, followed by current CP use and, more weakly, childhood CP exposure. The findings suggest that residual support for CP is concentrated in specific high-pressure situations and is closely embedded in broader CP-approving beliefs.

Keywords: corporal punishment; spanking; parents; child behavior; disciplinary attitudes

Introduction

Corporal punishment (CP) refers to the use of physical force intended to cause pain, but not injury, to correct or control a child's behavior (Straus, 2010). Although meta-analytic evidence links physical punishment with a broad range of detrimental developmental outcomes (Cuartas et al., 2025; Gershoff & Grogan-Kaylor, 2016), its use is partly sustained by beliefs about when a child's behavior makes a physical response seem warranted (Ateah & Durrant, 2005). Favorable attitudes toward CP therefore need not imply equal endorsement across all forms of misbehavior.

Prior findings show a contextual gradient. Spanking is judged more acceptable for dangerous, aggressive, norm-violating, or disrespectful behavior than for minor or developmentally typical misbehavior (Catron & Masters, 1993; Flynn, 1998). Parents also react more punitively when transgressions are perceived as serious, intentional, or attributable to the child (Ateah & Durrant, 2005; Rodríguez & Sutherland, 1999). Such judgments may be reinforced by beliefs that CP produces compliance, teaches respect for authority, or prevents recurrence (Holden et al., 1999). Furthermore, adults who view their own childhood

CP as deserved are more likely to approve of it later (Durrant et al., 2017).

Previous studies predominantly relied on broad attitudinal measures (e.g., Ateah & Durrant, 2005) or a small set of vignettes (e.g., Catron & Masters, 1993; Holden et al., 1999). Because prior work suggests both a general CP-support tendency (Subotić & Sibinčić, 2021) and situational variation (Flynn, 1998), we expected ratings across child behaviors to share a common dimension despite differences in endorsement levels. We also examined which behaviors were viewed as relatively more or less deserving of CP, and how overall situational CP endorsement related to parent gender, number of children, general CP attitudes, childhood exposure to CP, and current parental CP use.

Method

The sample comprised 190 parents, 76.8% mothers, with a mean age of 39.05 (*SD*=7.57) years. They reported a mode of 2 children (*M*=1.69, *SD*=0.69). Data were collected anonymously via an online survey, and participation was voluntary. All participants provided informed consent, and the study was conducted in accordance with standard ethical principles for psychological research.

Situational reasons for endorsing CP were assessed with a purpose-built list of 40 child behaviors developed iteratively for this research, ranging from danger, aggression, deliberate rule-breaking, and persistent defiance to everyday, developmentally typical, or mild socially undesirable behaviors. For each behavior, parents rated whether a child should be physically punished on a six-point scale from from 1 = "Never should a child be physically punished for this" to 6 = "A child should always be physically punished for this".

General CP attitudes were measured with 33 Likert-type statements from Subotić & Sibinčić (2021), scored from 1 to 5, with higher scores indicating stronger support (*M*=1.69, *SD*=0.66).

Childhood CP exposure was assessed with one 5-point item asking how often the parent had received physical punishment as a child (*M*=2.37, *SD*=0.80).

Current CP use was assessed with one 5-point item asking how often the respondent had physically punished their children during preschool and early school age (*M*=1.61, *SD*=0.71).

Figure 1: Single-Factor Loadings for the Situational-Justification Items.

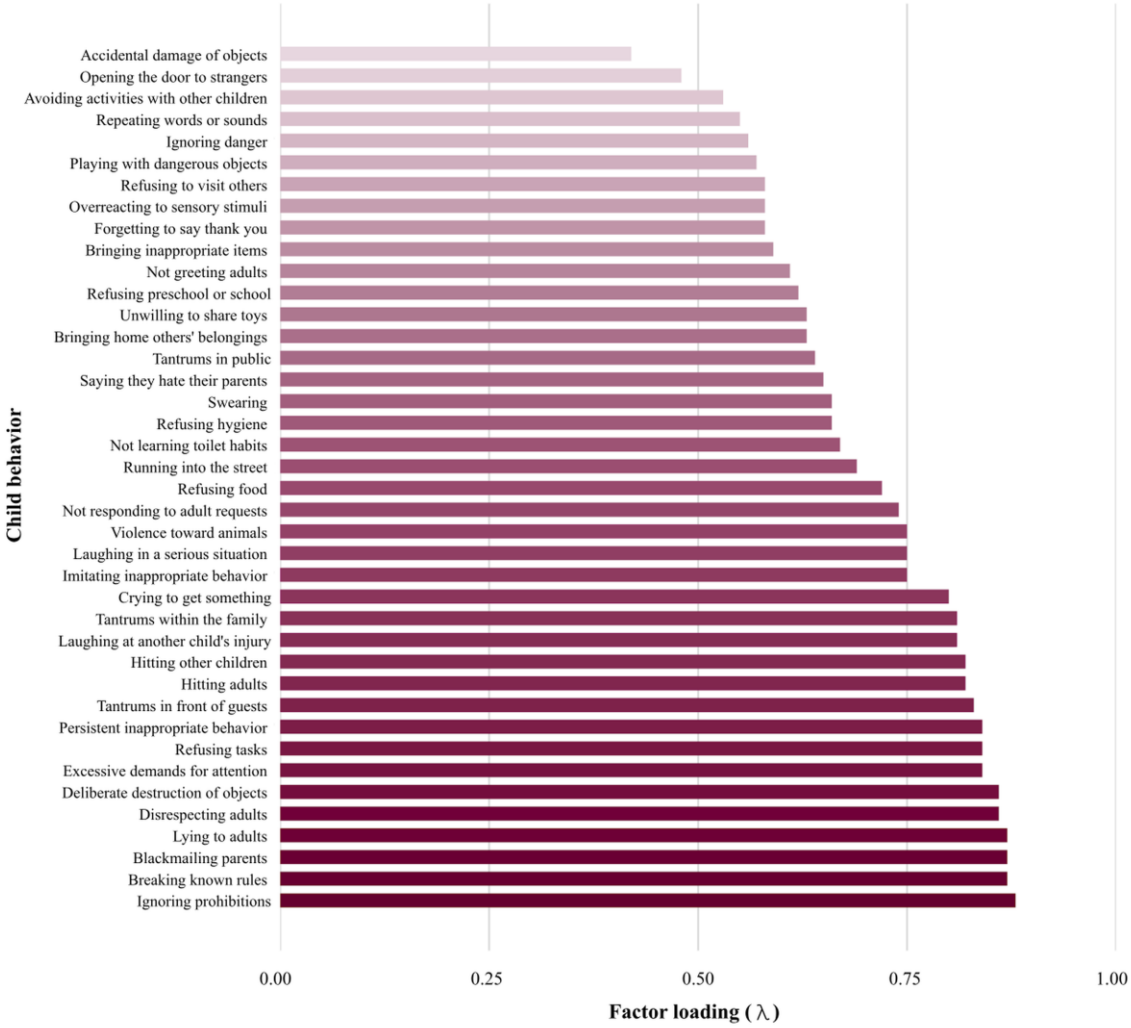
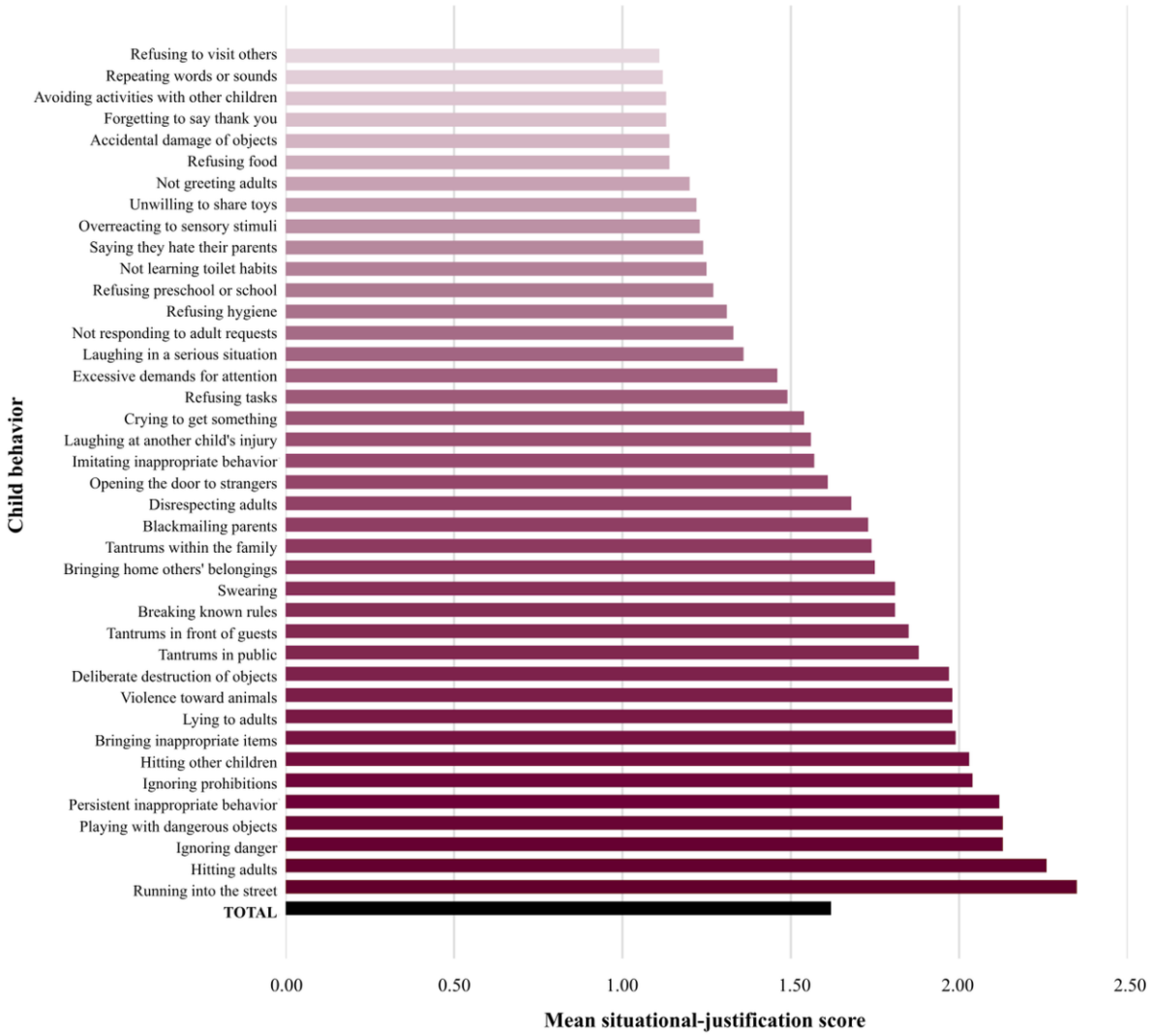


Figure 2: Mean Situational Justification of Corporal Punishment Across Child Behaviors.



Results

The EFA (ULS based on polychoric correlations) supported a strong common dimension underlying the 40 situational CP endorsement items. The single-factor solution accounted for 52.47% of the common variance (eigenvalue=20.56). Functional unidimensionality was supported by UniCo=.986, ECV=.922, and MIREAL=.181, all meeting the recommended criteria (UniCo>.95, ECV>.85, MIREAL<.30; Ferrando & Lorenzo-Seva, 2018). Internal consistency was very high, ω=.98. Most items met the item-level criteria, with only modest local departures for accidental damage of objects, avoidance of activities with other children, and forgetting to say thank you. Factor loadings ranged from .42 to .88 (Figure 1).

At the item level, situational endorsement was generally low, although a clear ordering emerged across child behaviors. The highest mean ratings were observed for running into the street (*M*=2.35, *SD*=1.37) and hitting adults (*M*=2.26, *SD*=1.36), followed by playing with dangerous objects (*M*=2.13, *SD*=1.28) and ignoring danger (*M*=2.13, *SD*=1.25). At the opposite end, the lowest ratings were found for refusing to visit others (*M*=1.11, *SD*=0.41), repeating words or sounds (*M*=1.12, *SD*=0.38), avoidance of activities with other children (*M*=1.13, *SD*=0.38), and forgetting to say thank you (*M*=1.13, *SD*=0.53). Figure 2 presents the complete pattern of item means. Consistent with these item-level results, overall situational CP endorsement was low (*M*=1.62, *SD*=0.66), falling between the response categories “never” and “very rarely” justified.

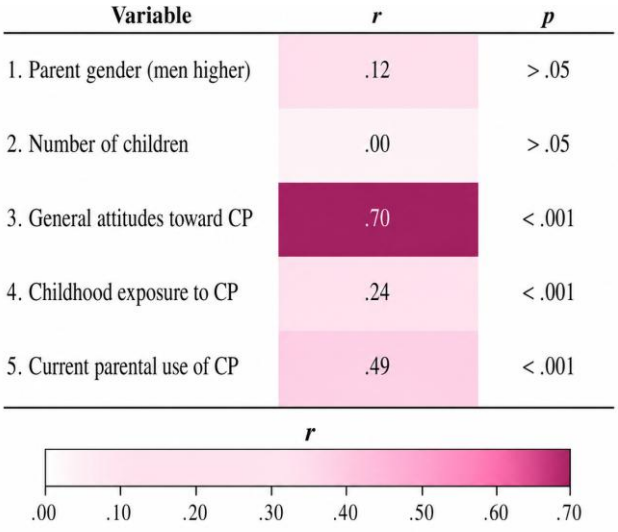
As shown in Figure 3, general CP attitudes were by far the strongest correlate of situational endorsement, followed by current parental use and, more modestly, childhood exposure. Parent gender and number of children were not significantly related to the overall score.

Discussion

The findings support the premise that parental endorsement of CP is strongly situation-sensitive. The common dimension, alongside item-level differences, suggests that

situational variation occurs within a broader tendency to justify CP rather than representing separate behavior-specific tendencies. Despite generally low approval, dangerous and aggressive behavior, persistent disobedience, and deliberate rule-breaking were viewed as relatively more plausible CP exceptions. This parallels findings that prudential and moral transgressions warranted more severe corporal punishment than social-convention violations (Catron & Masters, 1993), and that spanking was more strongly endorsed for serious violations such as stealing, talking back, and hitting a playmate than for milder misbehavior (Flynn, 1998). Perceived seriousness and intent were also associated with reported CP use (Ateah & Durrant, 2005), while greater perceived child culpability was linked to harsher discipline being judged as less severe and used more often in similar situations (Rodríguez & Sutherland, 1999).

Figure 3: Correlates of Overall Situational Corporal-Punishment Endorsement.



Notes: Pearson correlations; *df*=188 for all coefficients.

The very strong association with general CP attitudes suggests that situational judgments are embedded in a broader normative belief system. Parents who generally endorse CP are more likely to view specific situations as warranting it, whereas those who reject CP tend to do so across situations. This accords with evidence that approval predicts use and that frequent spankers expect greater immediate compliance and better longer-term behavior from spanking (Ateah & Durrant, 2005; Holden et al., 1999). The stronger association of situational endorsement with current use than with childhood exposure suggests that personal history alone is insufficient to explain present judgments. Childhood experience may still contribute to approval (Gagné et al., 2007), especially when punishment is remembered as deserved (Durrant et al., 2017).

The study is limited by a convenience sample dominated by mothers, self-report measures, single-item indicators of childhood exposure and current use, and its cross-sectional design. Still, the 40-behavior mapping identifies where residual CP justification is concentrated. Prevention may benefit from targeting "deserved punishment" beliefs in situations involving danger, aggression, and repeated defiance, while offering concrete non-physical alternatives. Overall, CP endorsement was low, but exceptions were systematic, psychometrically coherent, and closely linked to broader approving attitudes and current use.

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Parental and Teacher Mediation of Adolescent Generative Artificial Intelligence (GenAI) Use in Serbia: Adolescent Perspectives

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Abstract

Adolescents internationally are increasingly using Generative Artificial Intelligence for a range of activities, from assistance with homework and learning, to creative activities, socialization and mental health support. There is still a relative paucity of evidence as to how adolescents in Serbia engage with Generative Artificial Intelligence and specifically how their parents and caregivers mediate their use of these technologies. In order to better understand these processes, we conducted a qualitative study, 16 semi-structured in-depth interviews with adolescents aged 13 to 17 in Serbia. The study was part of the EU Kids Online international comparative research project, done in 14 other European countries. Participants in Serbia perceived relatively scarce mediation of their Generative Artificial Intelligence use from parents/caregivers and schools. There appears to be a lack of systematic Generative Artificial Intelligence rules at the school level. In young people's view, the responses from teachers tend to be ad hoc and vary from warning students against using Generative Artificial Intelligence for various tasks and attempts to detect such "cheating," to encouraging technology understanding and intentional use. We discuss the social and policy implications of our findings.

Keywords: adolescents; Generative Artificial Intelligence (GenAI); mediation; parents/caregivers; educators

Introduction

Adolescents are increasingly using Generative Artificial Intelligence tools (henceforth GenAI) for a range of purposes: From asking for help with learning and homework, to seeking socialisation and discussing mental health problems (Staksrud et al., 2026). GenAI refers to AI-enabled tools that can create multi-modal content in the form of text, image and video. These can include general purpose chatbot tools such as OpenAI's ChatGPT, Microsoft's Copilot, Anthropic's Claude etc; GenAI assistants built in apps such as WhatsApp, Snapchat and others; and also the so-called AI companion apps, designed to be "social" and provide emotional support, such as Replika, Nomi.AI or Character.AI (Natale & Depounti, 2024). While the body of research on children's AI use is expanding swiftly, relatively little is still known about how parents and educators in Southeast Europe engage in mediation practices of adolescent use of GenAI, as well as where and how young people acquire knowledge and advice about GenAI use. Mediation is an area of study that broadly refers to strategies that parents, caregivers, and educators use to guide, monitor, or restrict adolescent use of digital technologies such as GenAI tools (Kuldas et al., 2021; Livingstone et al., 2017; Livingstone & Helsper, 2008; Sciacca et al., 2022). Literature on this topic both internationally and in Serbia remains limited. Emerging studies on GenAI mediation internationally indicate that online safety strategies that parents adopted for digital media use more broadly, may be insufficient in light of GenAI's distinctive characteristics such as simulating human behaviour or generating incorrect or misleading content (Eira et al., 2025; Zhang et al., 2025). School-based policies and rules on GenAI use, as well as teacher approaches, are varied based on accounts of adolescent respondents in multiple European countries (Staksrud et al., 2026). To address this research gap, we ask the following research questions:

- RQ1: How do adolescents experience parental/caregiver mediation of their GenAI use?
- RQ2: How do these adolescents experience school-based and teacher mediation of their GenAI use?

Method

For this article, we rely on data from an international comparative study on adolescent use of GenAI, undertaken by the EU Kids Online research network in 15 European countries, including Serbia. We conducted 16 semi-structured in-depth interviews with adolescents aged 13 to 17 in three cities in Serbia. All countries relied on a standardized interview protocol and the interviews lasted between 50 and 80 minutes. The London School of Economics and Political Science (LSE) received the ethics approval for the international project (#439180). The interviews in Serbia took place between November 2024 and March 2025. We aimed for a gender-balanced (eight female, eight male) and diverse sample: The interviewees were recruited via primary and secondary schools (both high schools i.e. gymnasiums and specialized, technical schools); twelve interviewees were based in various parts of Belgrade while four others came from Zrenjanin and Vranje. The common codebook was developed by the

research leads[1] in collaboration with the international research team, and our approach to data was also informed by thematic analysis framework in qualitative research (Braun & Clarke, 2023). Coding was completed manually, where code values were supported by illustrative quotes, for example, the code "Teacher mediation" had several values, among which "GenAI not discussed at school by teachers," and if this value was chosen, quote from the interview, in addition to a reflexive comment from the coder, were provided. Coding was iterative and discussed among research teams. In Serbia, one coder was the primary one and the codes were discussed with the second coder. A more elaborate account of the findings based on this research will be available in the upcoming monograph (Milošević, forthcoming).

Results

Adolescents perceived relatively scarce mediation of their GenAI use from parents/caregivers and schools. Some teens talked about their parents not being aware of the fact that they used GenAI or how they used it, as illustrated by one participant when asked if her parents discussed GenAI with her: *"Well, not with parents. Interviewer: No, why? Girl: Well, […] They are not informed, they just don't know how to use the phone, they are not the parents who know how to use the phone [and AI either]." (female, 15).*
On the other hand, children whose caregivers discussed the use and social implications of GenAI technologies with them tended to have a more nuanced understanding and interest in these technologies: *"For Midjourney, my dad [showed me], I think. [...] I guess I've heard my dad say that making prompts for Chat GPT is important [how you phrase them]" (female, 13).* A common fear among some parents was of deskilling due to overreliance on GenAI: *For example, I'd talk about it [GenAI] with my mother […] for example, how doctors, dentists, surgeons, if they use it [GenAI], one day when they go to work, they will not be able to do their work well." (male, 16).*

School-based mediation

There appears to be a lack of systematic GenAI rules at the school level. In young people's view, the responses from teachers tend to be ad hoc and vary from attempts to detect GenAI-related "cheating" to encouraging GenAI understanding and intentional use. Some adolescents expressed confidence that they would not be caught when using GenAI without permission: *"I'm pretty sure my teachers don't know how to use those things [GenAI]" (male, 13).* There were, however, examples of individual teachers who provided guidance on functional aspects of GenAI use: *"I don't know, the math teacher told me about this program [GenAI software]. She told me that everyone uses it for tasks and explanations. [Interviewer]: She even recommended that you use it, right? [Boy]: Yes." (male 17).*
The more knowledgeable adolescents thought that schools needed to teach not just functional skills (GenAI use) but critical aspects too (e.g., societal impact): *"The whole point of school is to prepare us for our lives. So I think it is, you know, the duty of schools, of the educational system to give us advice about […] generative AI." (female, 13).*

Discussion and Conclusions

Our findings on adolescent perceptions of parental and school mediation suggest an urgent need for systemic stakeholder education about GenAI that targets parents, caregivers, teachers and school staff, which appears to be envisioned by the Strategy for the Development of Artificial intelligence in the Republic of Serbia 2025—2030" (The Government of the Republic of Serbia, 2025, Sl. glasnik RS, number 5/2025). Such education could potentially aid in preventing the furthering of the digital divide among young people, which our findings might indicate. Importantly, such measures should provide education not only about functional aspects of GenAI (how to use technology) or about the various content-related GenAI risks (e.g. misinformation, deepfake nudes etc.) but also about critical aspects of AI literacy, such as the negative systemic impact on the environment and the problematic social impacts of technological development (Bender et al., 2021; Crawford, 2021).

Limitations

Our findings are based on a small sample, within the qualitative research paradigm, and are by no means representative of views on parental and teacher mediation among adolescent population in the country. Furthermore, GenAI technologies are developing fast and the various uses among adolescents are evolving quickly as well. Nonetheless, our findings provide a much-needed account of early adoption and adolescent perceptions of mediation with respect to this emerging technology.

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The Relationship between School Climate and Multicultural School Practices with the Social Identification of Students

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Abstract

A positive school climate increases students' sense of belonging and strengthens their social identification with the school, while multicultural school practices enhance students' understanding of both their own and other people's cultural backgrounds. In this way, a learning environment is created in which students can freely explore and develop their social identity. The aim of this research was to examine the extent to which students' perceptions of a school climate and various multicultural practices predict their identification with different dimensions of social identity. The sample consisted of 1729 high school students from 20 different schools in Serbia. The results indicate that different multicultural practices are associated with social identity in different ways. Practices that provide opportunities to learn about students' own culture were positively related with identification with peers and the country of residence, while practices that emphasize learning about other cultures were negatively associated with the same social categories (identification with peers and Serbia). These results may reflect differences in the salience of social identity dimensions, with exposure to broader cultural perspectives potentially being associated with a more complex and less exclusively group-based sense of belonging.

Keywords: multicultural education; school climate; social identity; secondary school students

Introduction

During adolescence, social identity develops as a central process in which young people begin to define themselves through group membership (Azmitia et al., 2023; Hoffman & Umaña-Taylor, 2023). Most people have multiple social identities due to membership in different social groups (Tajfel & Turner, 1986). Adolescents belong to both ascribed (e.g., ethnicity or gender) and achieved (e.g. peers) groups that influence their social definition (Knifsend & Juvonen, 2013). The sense of belonging to different ascribed and achieved social groups plays an important role in the formation of their identity, self-concept, and psychosocial adjustment (Branje et al., 2021).

School is one of the central developmental settings for adolescents and is therefore the place where they shape understanding of themselves in relation to different social categories (Flum & Kaplan, 2012; Rich & Schachter, 2012). The importance of school to students' social identifications is indicated by perception of their psychological connection to school (Bizumic et al., 2009). Students who feel a stronger psychological connection to their school are more likely to internalize characteristics that are relevant and important to that school (Dunstone et al., 2024).

School climate encompasses almost every aspect of the school experience, including the quality of learning and teaching practices, the organizational and structural characteristics of the school setting and interpersonal relationships in the school environment (Wang & Degol, 2016). School climate shapes the quality of relationships, the sense of security, acceptance and inclusion of students in school life and therefore a positive school climate contributes to students feeling safe, accepted and included (Cohen et al., 2009). If students feel accepted and safe, they are more likely to develop positive identification with school, peers (Dunstone et al., 2024) and wider social categories.

In addition to the general school climate, the presence of multicultural school practices, such as promoting equality, teaching about group identity and culture, and recognizing inequality and unfair treatment of certain social categories (Byrd, 2015) can also have a strong influence on shaping adolescents' social identity. Byrd and Legette (2022) reported that, among adolescents, learning about one's own culture is associated with greater identity exploration and a greater sense of the importance of group membership, while learning about other cultures promotes positive attitudes toward people of different social categories.

Present study

In this paper, we aimed to examine the relationship between students' perceptions of school climate and the presence of multicultural school practices with the social identity of high school students. More specifically, we investigated how different dimensions of multicultural school practices and the general assessment of school climate are related to students' identifications with different social categories. The results of this research can contribute to a deeper understanding of the influence of dif-

ferent school aspects on the development of adolescents' social identity and therefore - practices that should be nurtured in schools.

Methodological framework

Sample

The sample consisted of 1729 students from 20 different secondary schools in Serbia. The average age of the students in the sample was 16.26 years, while girls comprised 52.6% of the sample. The schools in which the research was conducted belong to different parts of Serbia, such as Vojvodina, Central Serbia and Sandžak (in order to represent students from different cultural contexts). The majority of the students identified themselves as members of the Serbian ethnic group (69.9%), 11.1% identified themselves as Bosniaks, while 10.8% of the students identified themselves as Hungarians and 8.2% as members of the Roma minority group.

Data collection

We used the student version of Delaware School Climate Scale (DSCS; Bear et al., 2011) to measure school climate. The DSCS-S demonstrates high reliability for the total sum of raw scores, with a Cronbach's alpha coefficient of .90 (Bear et al., 2011). This scale consists of several subscales, which address teacher-student relationships, student-student relationships, clarity of expectations, fairness of rules, school safety, student engagement and bullying. Items were rated on a four-point Likert scale, with higher scores indicating more positive perceptions of school climate. In order to provide a comprehensive insight, a single composite school climate score was operationalized. Data on multicultural school practices were collected using the Ethnic-Racial Socialization (ERS) domain of the School Climate for Diversity – Secondary (SCD-S) Scale (Byrd, 2015), which includes 4 dimensions: (1) Promotion of Cultural Competence; (2) Cultural Socialization; (3) Cultural Consciousness Socialization; and (4) Colorblind Socialization. Strong reliability was established for all subscales of the SCD-S scale, with Cronbach's alphas ranging from .75 to .77. Items on this scale were rated on a five-point Likert scale, with higher scores indicating a greater prevalence of the respective multicultural school practices. To assess the degree of identification with: gender, ethnic group, place of residence, religion, family, friends, Serbia, the Balkans, and Europe, students completed the Social Identification Scale (SOCID; Branković et al., 2015). The scale consists of nine items rated on a five-point Likert scale, with higher scores indicating stronger identification with the respective social category.

Results

A multivariate general linear model (GLM) was used to examine the association between overall school climate and four dimensions of multicultural school practices with students' social identification. Before conducting the analysis, the assumptions of multivariate normality and linearity were inspected and no significant deviations were observed. Results indicate that two dimensions of multicultural practices have a statistically significant contribution to the overall model. These variables are: Promotion of Cultural Competence ($F_{(9, 1715)} = 2.47$, $p = .009$) and Cultural Socialization ($F_{(9, 1715)} = 4.20$, $p < .001$). The remaining dimensions of multicultural practices (Cultural Consciousness Socialization and Colorblind Socialization), as well as the overall school climate, did not demonstrate a significant effect (Table 1).

Table 1: Multivariate Tests.

Independent Variable	Wilks' Lambda (Λ)	$F_{(9,1715)}$	p	Partial Eta Squared (η^2)
Promotion of Cultural Competence	.987	2.465	**.009***	.013
Cultural Socialization	.978	4.200	**.000***	.022
Cultural Consciousness	.993	1.352	.205	.007
Colorblind Socialization	.993	1.287	.239	.007
School Climate	.995	1.018	.423	.005

Promotion of Cultural Competence contributed most strongly to predicting students' identification with gender ($t = -2.05$, $p < .05$), the peer group ($t = -2.87$, $p < .01$) and Serbia ($t = -2.13$, $p < .05$), while Cultural Socialization showed significant associations with the dimensions: centrality of the peer group ($t = 2.63$, $p < .01$), Serbia ($t = 3.99$, $p < .01$) and the Balkans ($t = 1.97$, $p < .05$).

Discussion and conclusions

Our findings indicate that some of multicultural school practices are differentially associated with specific categories of students' social identity, while overall school climate did not show any contribution to explaining students' social identity. Specifically, practices focused on learning about one's own cultural background were associated with stronger identification with peers, gender, and country of residence (Serbia), while practices of learning about other cultures were associated with weaker identification with the Balkans, Serbia, and peer group. One possible interpretation is that exposure to broader cultural perspectives may be associated with differences in the salience of social identity dimensions among students, potentially reflecting a more complex and less exclusively group-oriented sense of belonging. On the other hand, emphasizing the importance of their own culture may be associated with a stronger sense of belonging to certain social categories. Overall, the findings highlight the importance of applying a combination of different multicultural practices in education to promote students' engagement with both their own and other cultures, potentially creating space for greater freedom to explore their social identifications from multiple perspectives.

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The Three Musketeers of Higher-Order Cognition Ride Again: Implicit Understandings of Intelligence, Creativity, and Wisdom

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Abstract

Implicit theories of intelligence, creativity, and wisdom capture "lay beliefs" about what these constructs represent and complement explicit, scientific models. Rooted in everyday experience rather than formal instruction, they offer a bottom-up view of intuitive cultural conceptualization. This study examined which core elements people in parts of the Balkan region attribute to these constructs and how those elements interrelate. The sample comprised 484 adults from B&H, Serbia, and Montenegro. Participants described how they define and recognize these constructs and which characteristics they associate with them. Intelligence was perceived as reflecting ability, adaptation, resourcefulness, problem-solving, and knowledge application, with the strongest connections between problem solving and efficiency, and curiosity and knowledge application. Creativity was seen as rooted in ability, creative work, new ideas, imagination, originality, nonconformity, and eccentricity, reflecting a focus on novelty and nonconformity. Wisdom was perceived as grounded in knowledge, experience, thoughtfulness, ability, and emotional regulation, integrating cognitive competence with prudent judgment, self-control, and socially desirable behavior. Overall, intelligence was conceptualized through reasoning, creativity through originality, and wisdom through experience and self-regulation.

Keywords: implicit theories; lay conceptions; intelligence; creativity; wisdom

Introduction

Explicit theories are scientific models, whereas implicit theories or beliefs are "common-sense" understandings. Sternberg (1985) was the first to systematically examine intelligence, creativity, and wisdom together, including how people use these conceptions to evaluate themselves and others and perceive relationships among the constructs.

Intelligence comprises mental abilities enabling reasoning, learning from experience, problem-solving, adaptation, and management of thought processes (American Psychological Association, 2018; Sternberg, 1997). Two main implicit views are distinguished: entity, which regards intelligence as fixed, and incremental, which considers it developable through learning and engagement (Dweck et al., 1995; Dweck & Leggett, 1988). Incremental beliefs are associated with better achievement, perseverance, resilience, preference for challenges, and intrinsic motivation (Costa & Faria, 2018), whereas entity beliefs are associated with avoiding challenges, lower persistence and adaptability, and greater extrinsic motivation, with inconsistent links to achievement (Blackwell et al., 2007). Competitive educational systems may further encourage entity beliefs by emphasizing academic success (Liu, 2021).

Creativity involves generating original and appropriate or useful ideas, solutions, or products (Runco & Jaeger, 2012). Implicit conceptions emphasize novelty and originality more than usefulness (Abdulla Alabbasi et al., 2020; Runco & Jaeger, 2012). Cultural differences are evident: Americans emphasize originality, Chinese conceptions also include rarity, market appeal, entertainment, and interaction (Loewenstein & Mueller, 2016), while Korean participants also emphasize negative traits such as stubbornness and ignoring others' opinions (Lim & Plucker, 2001).

Wisdom integrates cognitive, emotional, and moral capacities for balanced, ethical, and contextually appropriate decisions (Ardelt, 2004; Sternberg, 1998). Its implicit conceptions include cognitive aspects, such as knowledge, life experience, and information integration, and affective aspects, such as empathy, benevolence, and valuing others (Clayton & Birren, 1980). Intelligence is generally not considered a key criterion of wisdom (Sternberg, 1985), and people with cognitive decline or dementia may still be perceived as wise, although severe decline may limit its expression (Barber et al., 2020). Incremental intelligence beliefs are also associated with greater optimism about wisdom development across the lifespan (Sternberg, 1985).

This study seeks to map the key determinants of intelligence, creativity, and wisdom as implicitly understood in parts of the Balkan region, specifically Bosnia and Herzegovina, Serbia, and Montenegro, where this research domain has been almost entirely neglected.

Method

The snowball convenience sample comprised 484 adults (74% women; 60% students) from B&H (63%), Serbia (31%), and Montenegro (6%). Online, participants provided open-ended definitions, behavioral descriptions, and characteristics of intelligence, creativity, and wisdom.

Four trained coders independently coded all responses. The principal investigator reviewed the codings and noted inconsistencies, which the team discussed in person over several rounds until complete agreement was reached, leaving no discrepancies in the final coding used in the analyses.

Category frequencies and phi coefficients (Φ), indexing co-occurrence of binary category indicators, were then calculated within each construct.

Participation was anonymous and voluntary, and the study followed standard ethical principles for research with human participants.

Results

Figure 1 summarizes category frequencies and Figure 2 their within-construct correlations.

Intelligence was associated with ability (44–61%), resourcefulness (42%), adaptation (18–34%), openness (30%), thoughtfulness (13–28%), problem-solving (9–28%), efficiency (18–20%), curiosity (9%), and knowledge application (8–15%), with Φ≈−.18 to .46. Stronger positive links connected problem-solving with efficiency and curiosity with knowledge application, whereas adaptation, heredity, and wisdom-related descriptors showed weaker or inverse associations.

Creativity centered on ability (39–42%), creative work (26–36%), new ideas (23–30%), imagination (16–53%), and originality, nonconformity, and eccentricity (7–19%), with Φ≈−.21 to .18. Mostly small negative Φs suggest a loose structure emphasizing novelty and unconventionality over socially desirable or goal-directed behavior.

Wisdom centered on experience (10–40%), ability (31–57%), thoughtfulness (25–43%), knowledge (23%), and calmness, pleasantness, and self-control (31–67%), with Φ≈−.27 to .42. The pattern combines cognitive and experiential elements with prudent, regulated, and socially desirable behavior.

Discussion

Intelligence

Ability, adaptation, problem-solving, information processing, efficiency, adaptive behavior, and knowledge application are consistent with definitions emphasizing learning, adaptation, problem-solving, and effective knowledge use (Sternberg, 1997). Their behavioral expression, particularly the strong problem-solving–effective action association, suggests a functional and adaptive view of intelligence. This pattern is compatible with an incremental perspective (Dweck et al., 1995), although malleability was not directly assessed. Characteristics such as smart, resourceful, open, thoughtful, and conscientious are similarly compatible with incremental beliefs (Costa & Faria, 2018), while less frequent references to inheritance, innate potential, and genetic predisposition hint at entity beliefs.

Creativity

Creative work, new ideas, imagination, expressiveness, and originality reflect core elements of implicit creativity, particularly novelty, imagination, and expressive ability (Abdulla Alabbasi et al., 2020; Runco & Jaeger, 2012). Person-level characteristics such as imaginative, innovative, open, eccentric, bold, and withdrawn are consistent with culturally variable implicit criteria extending beyond creative products (Loewenstein & Mueller, 2016). The greater emphasis on personality and behavior than product utility also distinguishes implicit conceptions from explicit definitions requiring novelty and functional value (Abdulla Alabbasi et al., 2020; Runco & Jaeger, 2012). Mostly small negative Φs suggest partly alternative descriptors rather than a tightly integrated prototype.

Wisdom

Wisdom combined cognitive and experiential aspects with affective, self-regulatory, and socially valued elements, broadly consistent with multidimensional views of wisdom (Ardelt, 2004). Experience, ability, knowledge, thoughtfulness, and intelligence reflected the former, while calmness, pleasantness, self-control, desirable behavior, and restrained behavior reflected affective, self-regulatory, and socially valued elements; virtue and spiritual dedication added a moral component. Strong associations of prudent action with desirable and thoughtful behavior suggest integration of judgment with socially appropriate and reflective action. Negative Φs also indicate some differentiation among wisdom-related qualities. Overall, the findings accord with the importance of life experience, reflection, and learning from mistakes in wisdom (Sternberg, 1985).

Conclusion

Taken together, we found that lay conceptions characterize intelligence mainly through adaptive reasoning and problem-solving, creativity through novelty and unconventionality, and wisdom through experience, judgment, and self-regulation.

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Figure S1: Categories and frequencies of intelligence, creativity, and wisdom definitions, behaviors, and personal characteristics.

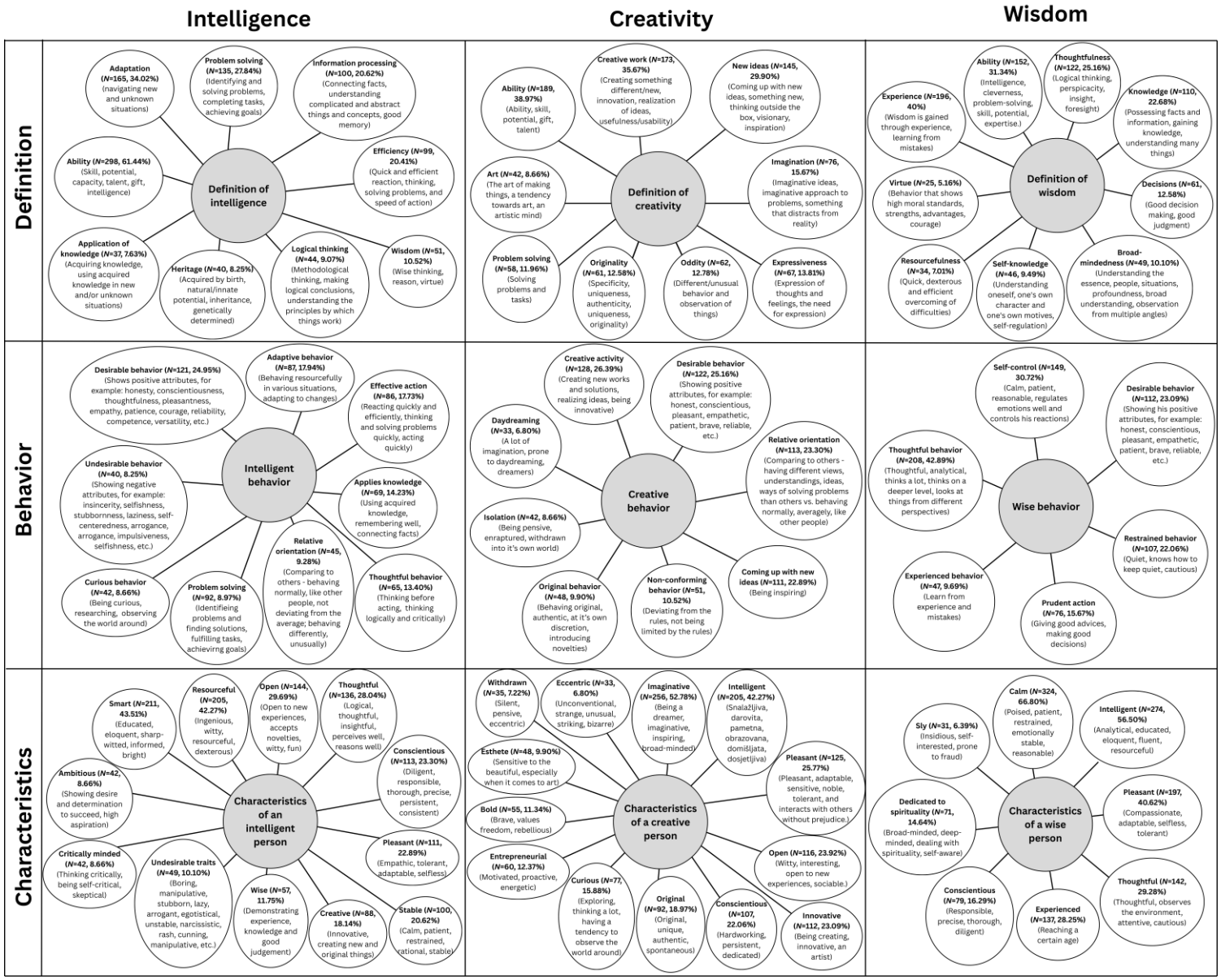
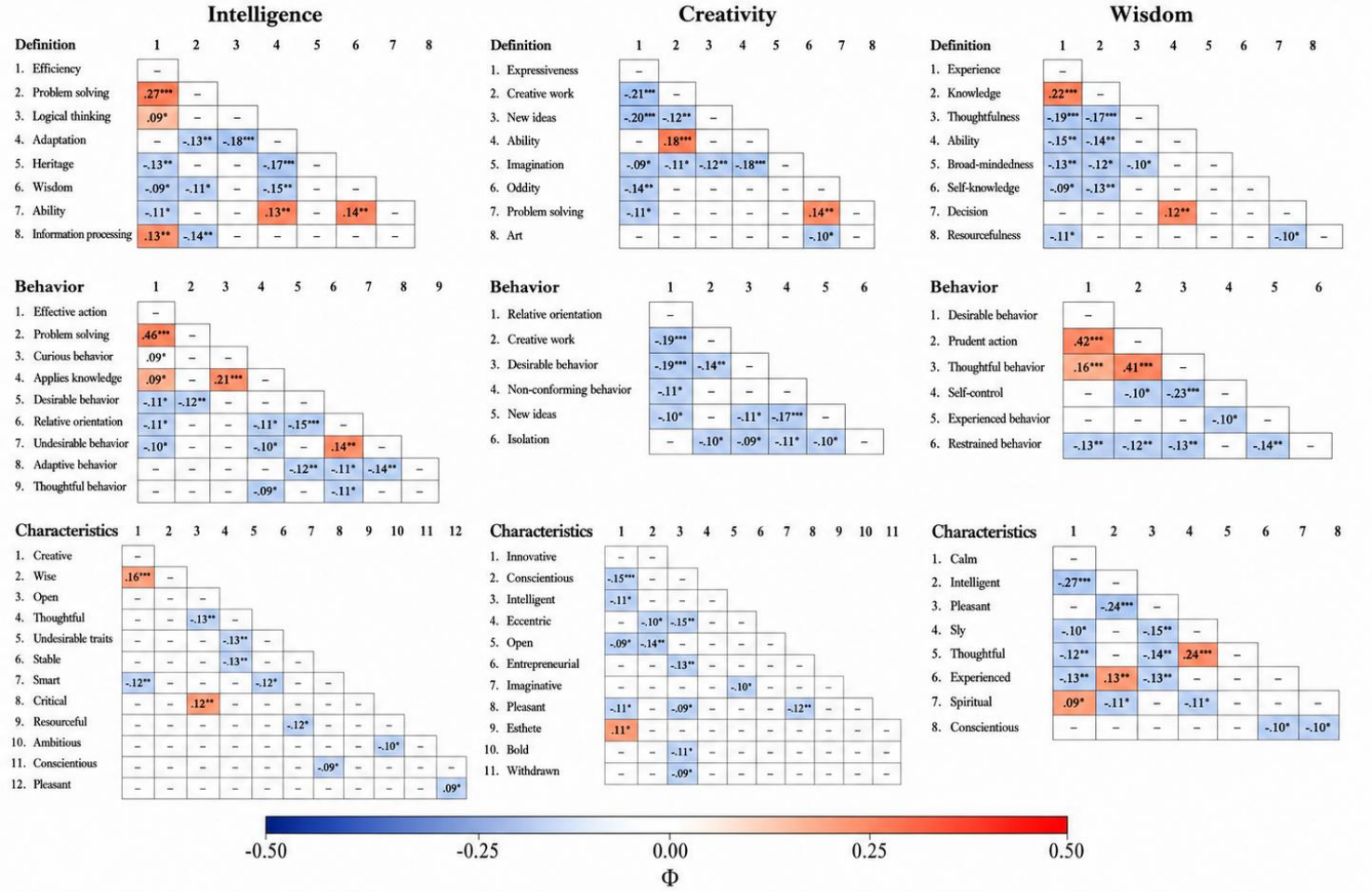


Figure S2: Correlations between definitions, behaviors, and personal characteristics categories within intelligence, creativity, and wisdom constructs.



Notes: Columns represent the three constructs, whereas rows represent definitions, behavior, and personal characteristics.

Φ = phi coefficient. * $p < .05$, ** $p < .01$, *** $p < .001$.

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Differences in Intercultural Competence Among Teachers Across Levels of School Climate Perception

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Abstract

The development of teachers' intercultural competencies is closely related to the quality of interpersonal relationships and the broader school climate. This study examined differences in teachers' intercultural competencies based on their perceptions of school climate. The study involved secondary school teachers from the Republic of Serbia. Teachers' intercultural competencies were assessed using the Teacher Intercultural Competence Scale, while school climate was examined using the adapted teacher version of the Delaware School Climate Scale. The findings indicate that teachers who perceive their school climate more positively demonstrate higher levels of intercultural competence across all examined dimensions, including self-efficacy in dealing with cultural diversity, commitment to social justice, appreciation of cultural diversity, attitudes toward minority integration, ethnorelativism, intrinsic motivation and orientation toward intercultural education. The results highlight the importance of supportive, inclusive, and positive school environments in fostering teachers' intercultural competencies and promoting effective intercultural education.

Keywords: school climate; intercultural competencies; teachers; cultural diversity; secondary schools

Introduction

Modern schools operate within increasingly multicultural and socially diverse societies, making teachers' intercultural competence an important component of professional functioning. Teachers are expected not only to recognize and respect cultural differences but also to adapt their communication, instructional practices, and interpersonal approaches to culturally heterogeneous students. Intercultural competence can therefore be understood as a multidimensional capacity encompassing knowledge, attitudes, motivation, self-efficacy, and behavioral dispositions necessary for effective interaction across cultural boundaries (Parkhouse & Massaro, 2019). Its development and application are embedded within the social and organizational context in which teachers work. Everyday interactions with students, colleagues, and parents from diverse cultural backgrounds provide opportunities to encounter different perspectives, reflect on cultural assumptions, and develop flexible responses to cultural differences. Thus, intercultural competence should not be viewed solely as an individual characteristic but also as a capacity dynamically constructed through social experience and embedded within the broader school context. Supportive and inclusive environments may facilitate this process by encouraging dialogue, openness, empathy, reflexivity, and adaptation of professional practices. Conversely, rigid norms, weak collegial relationships, limited collaboration, or insufficient institutional support may constrain the development and expression of intercultural competencies. Organizational practices such as collaborative learning, professional development, shared decision-making, and constructive staff communication can strengthen teachers' professional development and sense of efficacy in dealing with cultural diversity (Gay, 2018).

Previous research provides empirical support for the relationship between school context and teachers' intercultural functioning. A positive diversity climate has been associated with higher teachers' intercultural self-efficacy (Ulbricht et al., 2022), while teachers' intercultural competencies may contribute to a more positive classroom psychological climate through respectful communication, inclusion, and positive interpersonal relationships (Dyankova & Nikolova, 2023). The broader diversity context of schools has likewise been associated with teachers' intercultural competencies, highlighting the importance of meaningful contact across cultural groups (Dimitrijević, et al., 2024). More broadly, positive school climates are associated with social, emotional, and diversity-related competencies (Thapa et al., 2013), while culturally responsive and inclusive environments may foster empathy, openness, and positive attitudes toward cultural diversity (Gay, 2010; Banks, 2015). Supportive teacher–student relationships further provide opportunities for dialogue, perspective-taking, and intercultural understanding (Deardorff, 2006; OECD, 2018; Wentzel, 2012). Despite these findings, further research is needed to clarify the relationship between teachers' perceptions of school climate and specific dimensions of intercultural competence, particularly within the Serbian educational context. Therefore, the present study

examined whether teachers who perceive their school climate more positively differ in their levels of intercultural competencies.

Method

Participants

The study included 346 teachers from 20 secondary schools across Serbia (5 in Belgrade, 4 in Vojvodina, 5 in Southeast Serbia, and 6 in Southwest Serbia). The sample comprised 29% male and 71% female teachers, 74.6% Serbian, 10.2% ethnic minority, and 11.8% of mixed ethnicity. Culturally heterogeneous (46.2%) and homogeneous classrooms (46.5%) were almost equally represented, while 6.1% did not specify.

Instruments

Data were collected using two instruments. Teachers' intercultural competence was assessed with the Teacher Intercultural Competence Scale, comprising seven dimensions (Leutwyler et al., 2018; Petrović et al., 2016; Zlatković et al., 2017), while school climate was assessed using the 39-item, nine-subscale teacher version of the Delaware School Climate Scale (DSCS; Bear et al., 2016), adapted by Petrović et al. (2024). Both instruments demonstrated high internal consistency, with satisfactory to excellent Cronbach's alpha coefficients across subscales and total scales.

Procedure

Data were analyzed using descriptive and inferential statistical procedures. To examine differences in teachers' intercultural competencies as a function of perceived school climate, participants were divided into two groups based on their school climate scores: a low school climate group (below the 25th percentile) and a high school climate group (above the 75th percentile). This approach was used to compare teachers at the lower and upper ends of the distribution of perceived school climate, while excluding the middle 50% of scores from the group comparison. The use of percentile-based groups was intended to provide a clearer contrast between relatively lower and relatively higher perceptions of school climate. An independent-samples t-test was then conducted to compare the mean levels of intercultural competencies between the two groups. Statistical significance was evaluated at $p < .05$.

Results

Descriptive findings indicated generally favorable perceptions of the school climate, particularly regarding teacher–student relationships, while peer violence received the least favorable assessment. Teachers also demonstrated relatively high levels of intercultural competence, especially in their commitment to social justice, intercultural education goals, and appreciation of cultural diversity, whereas intrinsic motivation was comparatively less pronounced. An independent samples t-test was conducted to examine differences in intercultural competencies between teachers with low (below the 25th percentile) and high (above the 75th percentile) perceptions of school climate.

The results showed statistically significant differences across all examined dimensions of intercultural competencies, with teachers who had a more positive perception of the school climate achieving significantly higher scores compared to colleagues with lower perceptions.

Table 1: Comparison of Groups on Intercultural Competence Dimensions.

Dimension	t(139)	p	MD	d
Self-efficacy	-8.45	< .001	-0.64	1.11
Intrinsic Motivation	-8.41	< .001	-0.74	1.19
Social Justice	-8.43	< .001	-0.49	1.01
Cultural Diversity Appreciation	-8.13	< .001	-0.59	1.08
Minority Integration Attitudes	-6.98	< .001	-0.47	0.94
Ethnorelativism	-6.77	< .001	-0.52	0.97
Intercultural Education Goals	-7.95	< .001	-0.45	1.04

Discussion and Conclusion

The findings indicate that teachers who perceive their school environment as more supportive, inclusive, and respectful of diversity report higher levels of intercultural competence across all examined dimensions. More positive perceptions of school climate were associated with greater self-efficacy in handling cultural diversity, higher intrinsic motivation, stronger commitment to social justice, greater appreciation of cultural diversity, more positive attitudes toward minority integration, higher ethnorelativism, and stronger endorsement of intercultural education goals. The differences observed for attitudes toward minority integration were somewhat smaller than those observed for several other dimensions of intercultural competence; however, the effect size was still large ($d = .94$). Therefore, the findings indicate a substantial difference in attitudes toward minority integration between teachers reporting lower and higher levels of perceived school climate. These findings should be interpreted as an association between perceived school climate and attitudes toward minority integration rather than as evidence of a causal influence. Attitudes toward minority integration may also be related to personal values, prior experiences, and broader social norms.These findings are consistent with previous research showing that norms of equality, inclusion, and cultural pluralism are positively associated with teachers' intercultural self-efficacy (Ulbricht et al., 2022; Schwarzenthal et al., 2023).

The results support the view that intercultural competence is not solely an individual teacher characteristic but also develops and is expressed within a particular organizational and relational context. A school climate characterized by supportive relationships, inclusion, fairness, and recognition of cultural diversity may be associated with greater opportunities for teachers to engage constructively with cultural differences and with more positive attitudes, stronger motivation, and greater self-efficacy relevant to effective intercultural practice. This interpretation is consistent with meta-analytic evidence showing that a positive cultural diversity climate is associated with various

intergroup and socioemotional outcomes in school settings (Bardach et al., 2024).

Overall, the findings underscore the importance of school environments that actively support inclusion, cultural pluralism, and respectful interpersonal relationships. Professional development should therefore be accompanied by school-level efforts to strengthen inclusive organizational practices and culturally responsive environments. Such an integrated approach may be relevant for creating school environments in which teachers can effectively apply their intercultural competencies and may be associated with more supportive educational environments for students from diverse cultural backgrounds.

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Musical Activities and Socio-Emotional and Behavioral Skills of Roma Children

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Abstract

A substantial body of empirical evidence demonstrates the effects of musical training on the development of various non-musical skills. This study explored the relationship between musical skills mastery, social-emotional development, and difficulties in socially vulnerable children participating in the *Music of Hope* program, based on the *El Sistema* method. The data came from assessments of 91 elementary school Roma children in Grades I–IV, conducted by seven primary school teachers and one music teacher. They completed questionnaires measuring musical skills mastery, socio-emotional skills, and social, behavioral, and emotional difficulties. The findings suggest a positive association between music learning and socio-emotional skill development. Moreover, higher musical skills are associated with fewer behavioral, emotional, and social difficulties in classrooms led by music and primary teachers. The data also indicate differences in behavioral patterns between female and male students, with boys showing more behavioral difficulties and conduct problems, while girls demonstrated stronger social-emotional competencies and better interpersonal functioning. A follow-up study is required to investigate the causal nature of these relationships.

Keywords: musical skills; social-emotional skills; social-behavioral difficulties; Roma children; teacher ratings

Introduction

A growing number of studies have explored the benefits of music learning and engagement in musical activities for non-musical capacities and personal development. The existing body of research suggests that music learning is associated with the development of cognitive, emotional, and social abilities (Hallam, 2010; Pitts, 2007; Schellenberg, 2011; Schellenberg et al., 2015), as well as with well-being (Krause et al., 2019), emotional regulation (Sakka & Juslin, 2018; Williams et al., 2015), social relations (Pitts, 2007), helping practices and prosocial behavior (Kirschner & Tomasello, 2010; Williams, 2015), positive self-concept and a sense of social integration (Papageorgi, 2022; Welch et al., 2014).

The *Music of Hope* project was developed in partnership with the *El Sistema* movement to support the inclusion of vulnerable groups by fostering personal and social development through music-making. The project supports the EDI policy (Equality, Diversity and Inclusion) (Wolbring & Nguyen, 2023), recognizing that different groups may need additional support through active participation in musical activities and the promotion of personal and educational development (Downes et al., 2017). Previous studies have linked El Sistema-based extracurricular activities to positive outcomes and personal growth (e.g., enhanced self-esteem, well-being, focus, motivation) among disadvantaged groups (Alemán et al., 2016; Jovanović et al., 2016; Osborne et al., 2016).

Our main objective was to explore how musical skills mastery relates to social-emotional development and behavioral and social difficulties among marginalized Roma children after participating in music lessons based on the *El Sistema-Music of Hope* method. We adopted an exploratory approach to comprehensively elucidate this relationship. We also intended to explore differences by gender, age, and behavior in the regular and music classroom, as perceived by teachers.

Method

The cross-sectional research presents data from the first step of a three-part intervention assessment in an 18-month longitudinal study. The data were collected during a broader project led by Music Art Project's *Music of Hope* program[2].

Sample

The sample consisted of 91 Roma children (56% female) aged 7–13 years (M = 10.1) attending grades I–IV at "Branko Pešić" Primary School in Zemun, an institution providing education for both children and adults, including children who have dropped out of mainstream primary e-ducation, most of whom are Roma.

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Instruments and procedure

Socio-emotional Skills Questionnaire (SEMS, Einpaul et al., 2024), consisting of 34 5-point Likert scale items, was used to measure nine skills – Self-Control, Persistence, Responsibility, Emotional Control, Stress Resistance, Empathy, Cooperation, Trust and Assertiveness that constitute 4 higher-order skill domains – Self-management, Emotional Regulation, Collaboration and Amity, and Engaging with Others.

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997), comprising 25 items across five scales, was used: Emotional and Conduct Difficulties, Hyperactivity, and Peer Difficulties scales to measure difficulties, and the Prosocial scale to measure strengths.

The Musical Skills Mastery Questionnaire (MUS) was developed for the present study and is based on MAP's *Music of Hope* Curriculum (2024), measuring Performance and Creative Competencies (PC), Music Analysis (MA), and understanding of the Cultural Context (CC).

Seven primary school teachers (PTs) and a music teacher (MT) assessed the same children approximately 5-6 months after El Sistema-based music lessons started. Music lessons took place 2 times per week and were a mandatory part of the school curriculum for 6 months. It included a variety of activities (e.g., singing, dance, body percussion, out-of-school performances). Individual participation duration/frequency was not recorded, thus not included in the analysis. Only MT completed the Musical Skills Questionnaire. Both the MT and the PT completed the SEMS and SDQ questionnaires. Each PT assessed the students in their own class, whereas the MT assessed all participants.

Results

The results showed that higher MUS scores were significantly related to higher SEMS scores (correlations ranged from r = .29 to r = .73, p < .05 for all 9 scales) as perceived by PTs and MT. This suggests that music-making, performance, knowledge of, and understanding of the cultural context are broadly related to socio-emotional regulation and skills across all 4 socio-emotional domains (Table 1).

Table 1. Correlations between SEMS domains and Musical Skills.

	SEMS domains	CP	MA	CC
MT's assessment	Self-management	.66**	.68	.67**
	Emotional regulation	.59**	.71**	.65**
	Collaboration-Amity	.74**	.49**	.47**
	Engaging	.68**	.62**	.59**
PTs' assessments	Self-management	.55**	.34**	.30*
	Emotional regulation	.47**	.36**	.35**
	Collaboration-Amity	.57**	.39**	.34**
	Engaging	.49**	.34**	.36**

Furthermore, results indicate a low-to-moderate negative association between the assessed level of MUS and SDQ (r = -.23 to r = -.49, p < .01) across all subscales (excluding the Prosocial scale). Namely, in both school settings, children with higher musical skills show significantly fewer difficulties and higher prosocial behavior, as perceived by PTs and MT, namely in general and music classes

Gender differences were only registered in MT's assessments of their behavior in music lessons – female students were appraised as having higher levels of self-management (F(1, 80) = 12.92, p < .001), emotional regulation (F(1, 80) = 14.78, p < .000), collaboration and amity (F(1, 80) = 9.89, p < .002) and engagement with others (F(1, 80) = 6.94, p = .010), while male students were reported to display more emotional difficulties (F(1, 80) = 10.73, p = .002), conduct difficulties (F(1, 80) = 19.10, p < .000) and hyperactive behavior (F(1, 80) = 27.48, p < .000).

The significant differences between PTs' and MT's assessments on both SEMS and SDQ scales across all subscales/domains were registered, with MT's assessment being significantly lower on SEMS and higher on SDQ scales.

Further, data showed that only MT registered significantly higher levels of Emotional Difficulties (F(2,54) = 4.39, p = .017) and Hyperactivity (F(2,54) = 3.50, p = .037) in the older age group (after age 9).

Discussion and conclusions

The results suggest that participation in musical activities is associated with fewer social, behavioral, and emotional difficulties and with higher levels of self-management, emotional regulation, and social development among socially vulnerable children. These results apply to both music and primary teacher classes, and are very encouraging.

Exploratory analyses suggested gender differences in socio-emotional and behavioral patterns in music lessons. We speculate that gender schemas may explain these differences in music classes. Previous studies reported that both genders limit themselves to music activities esteemed as gender-appropriate (Green 1993, 1996, 1997, as cited in Harrison, 2007). Vocal activities, notably associated with femininity (Winslow, 1946, as cited in Harrison, 2007), are among the most common in music classes, partly because they are accessible. Mandatory participation in singing may elicit stereotype-driven shame and protest, leading to disinterest and disruptive behavior among male students. We further speculate that *El Sistema*'s emphasis on female empowerment may have led MT to devote more effort to supporting female students. The present study did not assess these mechanisms, so further investigation is needed to test these hypotheses.

Age-related differences in behavioral and emotional control were registered. These changes may reflect early maturation accelerated by community demands to adopt adult social roles (Chovan et al., 2024), but this hypothesis requires further research.

The limitations of this study include the small sample size and lack of control of involvement frequency. A

common rater effect may have contributed to the observed correlations, as a single MT rated all participants. Therefore, some of the associations between variables may reflect shared rater-related variance. Similarly, PT ratings may have been influenced by their relationship with students. Furthermore, self-report measures are needed to better understand students' subjective experiences. These findings require replication and further investigation.

The results indicate a relationship between musical skills mastery and the development of socio-emotional skills (self-management, emotional regulation, collaboration, and engagement with others) in two primary school settings with possible differences by gender and age. Participation in the *El Sistema-Music of Hope* programs might be linked to positive outcomes in marginalized youth, as also shown in other research (e.g., Kirschner & Tomasello, 2010; Pitts, 2007; Sakka & Juslin, 2018; Williams, 2015; Williams et al., 2015). However, because the study lacks baseline assessments and is cross-sectional, further investigation is needed to clarify possible causal relationships.

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The Effect of Narrative on the Aesthetic Evaluation of Yugoslav Industrial Design: Role of Vicarious Nostalgia

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Abstract

Contextual information can shape aesthetic judgment of objects, depending on information type and individual differences. Few studies distinguish practical information (production, functionality) from affective information (brand heritage, history), which can evoke nostalgia. We examined effects of practical and affective narratives, and the role of vicarious nostalgia on evaluations of everyday objects: liking, desire to own, and buying intentions, using Yugoslav industrial design. We predicted (H1) both narrative types would increase ratings, and (H2) affective narratives would boost ratings only among individuals high in vicarious nostalgia. Participants (N=160, aged 18-30) completed a mixed design with narrative type (practical, affective, none) as within-subject factor, and vicarious nostalgia (low/high) as between-subject factor. Stimuli were 30 photos of Yugoslav-era household items, paired with narratives via Latin square design. Practical narratives increased desire to own, and buying intentions; liking was unaffected. Vicarious nostalgia moderated effects: high-nostalgia participants showed greater liking, desire to own and buying intentions with any contextual information present; affective narratives worked only in this group. Evaluation depends not just on functionality, but also on evoked emotion and meaning.

Keywords: aesthetic evaluation, vicarious nostalgia, narrative effect, Yugoslav industrial design

Introduction

Information that facilitate understanding, such as titles, influences aesthetic preference (Leder et al., 2006). Individual differences modify this effect. Experts rely less on contextual information, possessing relevant declarative knowledge, while laypeople tend to use cues such as titles as heuristics for object value (Darda & Chatterjee, 2023; Cleermans et al., 2016; Maheswaran, 1994). Individuals higher in Openness show stronger preference increases when new information is present (Fayn et al., 2015; Darda & Chatterjee, 2023). Nostalgia proneness is also relevant: personal nostalgia (longing for one's own past) is more effective for products associated with security, while vicarious nostalgia (longing for a period not personally experiences) is linked to products signaling prestige, such as furniture (Merchant et al., 2013; Stern, 1992).

Most studies on narrative effects have relied on generic contextual information (e.g. titles, artist names) without separating practical information (functionality, visual features) from affective information (emotional or historical associations). In marketing, affective information often takes the brand heritage narratives form, describing a brand's history and spirit of its originating period (Merchant & Rose, 2013). Such narratives are thought to operate affective evaluation, increasing connection to the brand via evoked vicarious nostalgia (Merchant & Rose, 2013; Merchant et al., 2013).

A limitation of prior research is that practical and affective narratives have never been examined separately, leaving their distinct effects unclear and how current affective states like vicarious nostalgia interact with narrative effects remains unexplored. The present study addresses this by constructing practical and affective narratives independently and testing their effects on evaluations of Yugoslav industrial design objects, moderated by vicarious nostalgia.

We hypothesized that (H1) practical and affective narratives would increase object ratings compared to no narrative, and (H2) that this effect of affective narratives would be more pronounced among individuals reporting higher levels of vicarious nostalgia.

Method

Sample

Number of participants was 160 (72.5% women, M_{age} = 22.54), recruited online by convenience. Eligibility required 18 - 30 years old participants, ensuring they did not live in Yugoslav period. This criterion was intended to isolate vicarious nostalgia evoked by the stimuli from personal nostalgia.

Stimuli

Stimuli were images of Yugoslav industrial design objects, grouped into 5 categories: lighting, decoration, tableware, furniture and appliances. Each object had to remain functional today, were intended for everyday use and require no specialized expertise to evaluate. An initial 35 stimuli was pre-tested on a sample of 10 participants who rated familiarity, usefulness and complexity. Based on ratings, 3 stimuli per category were retained (30 total) and distributed across 3 subsets.

Each image was accompanied by one of three narrative types, differing in content and affective tone. The practical narrative provided information about the material, production technique, year of manufacture and instructions for use. The affective narrative described brand's origin, significance and identity. Both were matched in the number

of new facts and length (sentence count). In the pre-test, affective narratives were rated as more informative ($t(34) = 6.84$, $p < .001$), emotional ($t(34) = 10.83$, $p < .001$) and positive ($t(34) = 9.53$, $p < .001$) than practical narratives.

Instruments

Expertise/familiarity with design were operationalized as familiarity with Yugoslav industrial design and manufacturers (brands), assessed via two items measured before stimulus exposure: matching brands to their origin country and matching brands with products type.

Openness/Intellect was measured using Big Five Aspect Scale's Openness/Intellect dimension (DeYoung et al., 2007) on a 5-point Likert scale.

Vicarious Nostalgia Scale measures the degree to which person experiences nostalgia for a period never personally experienced, following induction via stimulus exposure, comprising Past oriented Cognition, Evoked Positive Emotions and Evoked Negative Emotions on 5 point Likert scale (Chi & Chi, 2020).

Aesthetic preference scale was measured on 5 point bipolar semantic differential scale using items representing liking ("I don't like it" - "I like it"), ownership ("I would not like to own this" - "I would like to own this") and buying ("I would not buy this" - "I would buy this").

Design and Procedure

The study used a 3x2 factorial design. Narrative type (none, practical, affective) was manipulated within stimuli but not within participants. Stimuli were divided into 3 subsets, one exemplar per category per subset, assigned to narrative conditions via Latin square. Nostalgia level (low, high) was based on a median split of the Vicarious Nostalgia Scale score. Expertise and Openness were treated as control variables.

The experiment was constructed on the *SoSci Survey* (Leiner, 2021). Participants were randomly assigned to one of the counterbalancing lists. Participants completed the expertise measure, followed by viewing images of objects accompanied by narrative and rating the objects on the scales described above. Each participant rated 30 images in randomized order. Following, participants completed the Vicarious Nostalgia Scale and the Openness/Intellect scale.

Results

Repeated-measures ANOVA comparing no-narrative, affective and practical conditions showed no effect of narrative on liking $F(2, 277.72) = .93$, $p = .393$. However, narrative significantly affected desire to own $F(2, 290.87) = 4.60$, $p = .013$, $\eta^2 = .028$ and buying intentions $F(2, 300.72) = 4.87$, $p = .009$, $\eta^2 = .030$. In both cases, ratings were highest in the practical narrative condition, with no significant difference between no-narrative and affective narrative conditions.

Repeated measures ANOVA (narrative x nostalgia level), controlling for expertise and Openness) showed significant narrative x nostalgia interaction for liking an object $F(2, 279.85) = 7.06$, $p = .002$, $\eta^2 = .043$ (Figure 1).

For ownership, interaction $F(2, 291.01) = 4.63$, $p = .013$, $\eta^2 = .028$ was also significant (Figure 2), as for buying intentions $F(2, 298.89) = 3.44$, $p = .036$, $\eta^2 = .021$ (Figure 3). Including expertise and Openness as covariates didn't change the significance of these effects.

Figure 1. Interaction between narrative effect and vicarious nostalgia - liking measure.

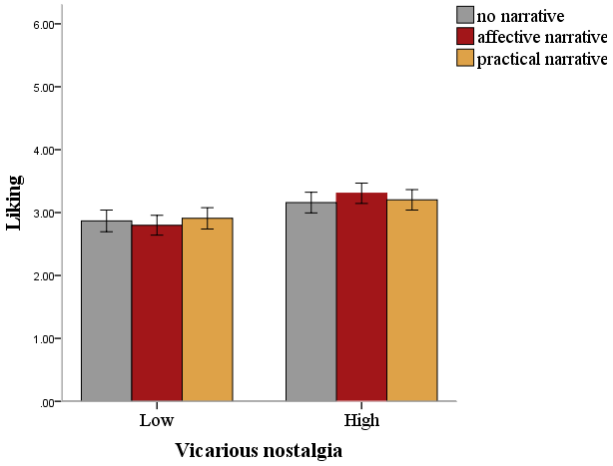


Figure 2. Interaction between narrative effect and vicarious nostalgia - ownership measure.

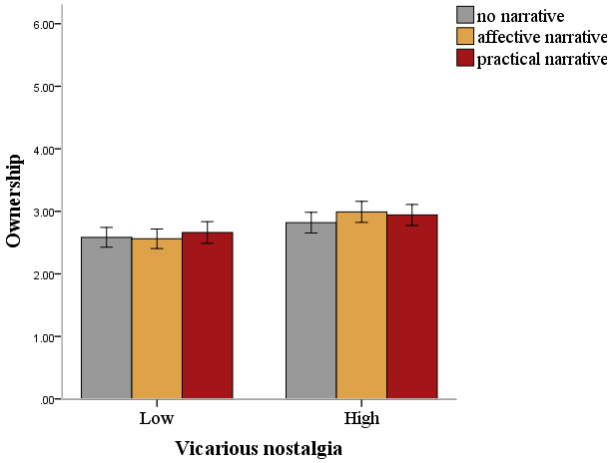
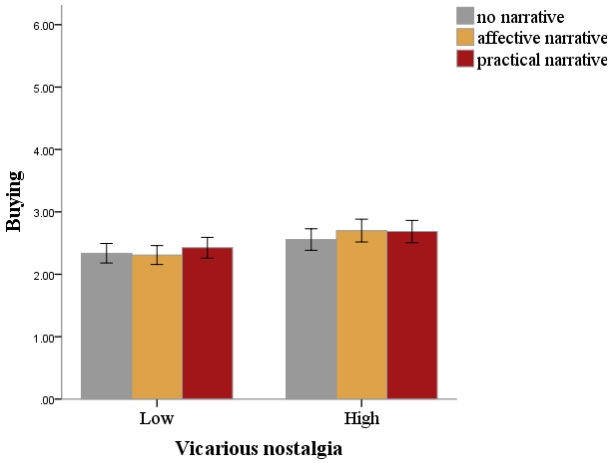


Figure 3. Interaction between narrative effect and vicarious nostalgia - desire to buy measure.



Discussion and Conclusion

When individual differences weren't considered, contextual information mattered mainly for ownership and buying measures, with practical information being the most influential reflecting the practical nature of stimuli. When vicarious nostalgia was considered, affective narratives became relevant even for judgements such as buying, among individuals reporting high nostalgia. This suggests that affective narrative receptiveness depends on content resonating with the individual's affective engagement, consistent with prior findings that narratives are more persuasive when aligned with self-relevant meaning (Escalas, 2004; Stern, 1992). Expertise and Openness showed negligible or unexpected effects because industrial design objects engage curiosity and knowledge differently than fine art.

Limitations include a smaller sample than planned and pre-test narrative sets that differed more than intended in informativeness, likely due to imprecise operationalization (sentence count) and the abscence of accompanying images during pre-testing.

These findings indicate that aesthetic evaluation reflects not only functional properties but also meaning and emotion shaped by narrative and individual affective disposition.

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Work Stress as a Mediator Between Workplace Characteristics and Job Satisfaction Among Correctional Security Officers

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Abstract

Correctional work is widely recognized as a demanding occupation characterized by high levels of responsibility, potential safety risks and complex interpersonal interactions. These conditions may negatively affect correctional officers' well-being and job satisfaction. At the same time, certain workplace resources may help support more positive work outcomes. Drawing on the Job Demands–Resources (JD-R) framework, this study examined whether work stress mediates the relationship between role conflict, perceived environmental safety, and job satisfaction. As part of the PRISCLIM project, 733 correctional security officers participated in this study. The results revealed two distinct pathways. Role conflict was negatively associated with job satisfaction both directly and indirectly through increased work stress. In contrast, perceived environmental safety demonstrated a positive direct association with job satisfaction and an indirect association through reduced work stress. These findings highlight the importance of both job demands and job resources in shaping employee well-being in correctional settings.

Keywords: Role conflict; Perceived environmental safety; Work stress; Job satisfaction; PRISCLIM

Introduction

While every profession has its own specific demands, correctional work is often considered particularly challenging due to the unique environment. Correctional security officers operate in settings characterized by multiple responsibilities, constant supervision of inmates, and potential safety risks. As a result, research has consistently identified work stress and other difficulties as common problems among correctional staff (Akbari et al., 2017; Steiner & Wooldredge, 2015). These challenges, along with the rewarding aspects of the job, may influence correctional officers' overall job satisfaction.

According to the *Job Demands–Resources* (*JD-R*) model (Bakker & Demerouti, 2007; Demerouti et al., 2001), every occupation includes specific job demands and job resources that influence employee well-being and work-related outcomes (Bakker & Demerouti, 2017). Job demands refer to aspects of work that require sustained effort and are associated with certain physiological and psychological costs, while job resources represent aspects of the work that help employees achieve work goals, reduce job demands, or stimulate personal growth (Schaufeli & Taris, 2014). In correctional settings, role conflict can represent an important job demand, as officers may face competing expectations related to security procedures, interactions with inmates, and organizational requirements. High job demands may increase levels of work stress, which can subsequently reduce job satisfaction. Conversely, perceived environmental safety may function as a job resource, as safer work environments can reduce strain and contribute to more positive job attitudes.

Previous research conducted in both correctional and other occupational contexts has shown that job demands and resources may influence work-related outcomes both directly and indirectly through stress-related mechanisms (Lambert et al., 2007; Otu et al., 2018). Therefore, the aim of this study was to examine whether work stress mediates the relationship between role conflict, perceived environmental safety, and job satisfaction among correctional security officers.

Method

Participants

The total sample consisted of 733 correctional security officers (M_{age} (*SD*) = 42.75 (9.93)), of whom 87.1% were male. The majority of participants had completed secondary school (74.2%). Regarding work experience, the largest proportion of officers reported having more than 20 years of work experience (39.9%).

Instruments

Role conflict was measured using three items adapted from Pahkin et al. (2007). An example item is: "*I am receiving conflicting requests from two or more people.*". Participants responded on a five-point Likert scale ranging from 1 to 5 (the same response format was used for all other scales).

Perceived environmental safety was assessed using three items (e.g. "*I feel safe when working among inmates.*") (Armstrong & Griffin, 2004).

Work stress was measured using five items (Armstrong & Griffin, 2004) (e.g. "*When I'm at work, I often feel tense or uptight.*").

Job satisfaction was assessed using nine items developed by Šverko and Galić (2009). An example item is: "*To what extent are you satisfied with your colleagues at work?*".

In addition, participants reported sociodemographic information, including gender (male/female), work experience (from 1 year to more than 20 years of work experience), and education level (secondary/higher education).

Procedure

Data were collected in person as part of the *PRISCLIM* project. During shift roll calls, members of the research team informed participants about the research objectives,

voluntary participation, anonymity and the right to withdraw at any time. As a token of appreciation, participants received a €5 gift voucher.

Results

Before conducting SEM analysis in *R* (*lavaan* package) (Rosseel, 2012), descriptive (Table 1.) and correlation indicators (Table 2.) were examined.

Table 1: Descriptive statistics of the used variables.

Variables	*M*	*SD*	α
1. Role conflict	2.66	0.94	.84
2. Perceived environmental safety	3.52	1.00	.81
3. Work stress	2.90	0.98	.81
4. Job satisfaction	2.89	0.79	.88

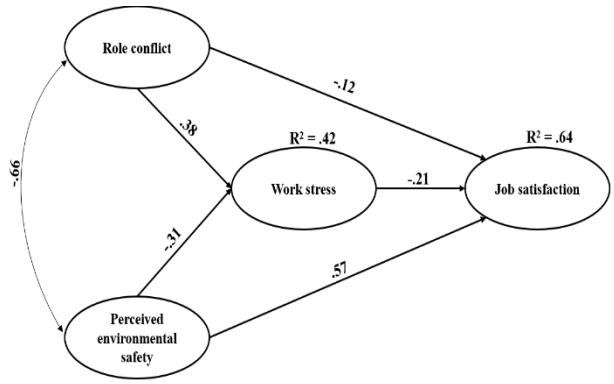
Table 2: Correlations of the used variables.

Variables	1.	2.	3.	4.	5.	6.	7.
1.		-.54**	.50**	-.55**	-.10**	.06	.02
2.			-.48**	.67**	.09*	-.11**	.07
3.				-.56**	-.08*	.17**	-.04
4.					-.03	-.17**	.05
5.						-.09*	.08*
6.							.05
7.							

Note. 1. Role conflict, 2. Perceived environmental safety, 3. Work stress, 4. Job satisfaction, 5. Gender, 6. Work experience, 7. Education level; *$p < .05$, **$p < .01$.

Correlation analysis revealed moderate to high correlations between the four focal study variables (Table 2).

Figure 1: Structural equation model of job satisfaction among correctional security officers (N = 701).



Note. Standardized path (β) coefficients are presented.

SEM model, controlling for gender, work experience and education level, is presented in Figure 1. It demonstrated acceptable fit to the data, $\chi^2(220) = 725.11$, $p < .01$, CFI = .93, TLI = .92, RMSEA = .06, SRMR = .05. Role conflict showed a significant negative direct association with job satisfaction (β = -.12, $p < .05$), perceived environmental safety demonstrated a significant positive direct association with job satisfaction (β = .57, $p < .01$), while work stress was negatively associated with job satisfaction (β = -.21, $p < .01$). The indirect effect of role conflict on job satisfaction through work stress was significant (b = -0.13, 95% CI [-0.22, -0.07]), as was the indirect effect of perceived environmental safety (b = 0.11, 95% CI [0.05, 0.17]).

Discussion and conclusions

The aim of this study was to examine whether work stress mediates the relationship between role conflict, perceived environmental safety, and job satisfaction among correctional security officers. The findings supported the expected assumptions. Role conflict showed both a negative direct association with job satisfaction and an indirect association through work stress. This could suggest that when correctional officers experience incompatible or competing job expectations, they are more likely to experience higher levels of work stress, which in turn lowers their job satisfaction. These findings are consistent with the *JD-R* framework, according to which conflicting job demands contribute to strain and undermine positive work-related outcomes (Bakker & Demerouti, 2017). They are also in line with previous research in correctional settings showing that role-related stressors and conflicting expectations are associated with higher stress and lower job satisfaction among correctional officers (Armstrong et al., 2015; Lambert et al., 2005). Perceived environmental safety showed a positive association with job satisfaction, both directly and indirectly through work stress. This could suggest that perceptions of safety may function as an important job resource within correctional settings (Armstrong & Griffin, 2004). Considering the inherently demanding and potentially dangerous nature of this work, it may play a particularly important role in maintaining officers' well-being and job satisfaction.

From a practical perspective, correctional institutions could improve officers' job satisfaction by reducing role conflict through clearer role expectations and improved communication within the organizational hierarchy. Additionally, organizational efforts aimed at strengthening perceptions of environmental safety, such as effective safety procedures and institutional support, may help reduce work stress and foster more positive job attitudes among correctional officers. Nevertheless, when interpreting these findings, the mediation effects should be interpreted with caution due to the cross-sectional design, which precludes making causal inferences. Furthermore, all variables were assessed using self-report measures, which may increase the bias of observed associations. The proposed model explained a substantial proportion of variance in job satisfaction, suggesting that the examined relationships could provide a parsimonious

explanation of work-related outcomes. Future research could expand this model by including additional indicators of job demands, job resources, and strain, as well as other work-related outcomes.

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Predicting Leadership Style Preferences from HEXACO Personality Traits

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Abstract

Leadership effectiveness depends on leaders' behaviours, situational factors, and follower characteristics, with follower characteristics shaping how leaders are perceived and evaluated. The same leader can motivate some while demotivating others, influencing follower job satisfaction and job performance. This study aimed to investigate whether individual differences in personality traits predict individuals' preferences for leadership styles. The sample consisted of 214 students (150 female) from the University of Niš, aged 19 to 39 years who completed electronic questionnaires, anonymously and voluntarily. Personality traits were assessed with HEXACO-PI-R 60 scale, while preferences for leadership style were measured with Yukl's taxonomy of leader behaviours, classified into: Task-oriented, Relationship-oriented, and Change-oriented behaviours. Higher levels of Emotionality and Openness to Experience contribute to a greater preference for all three leadership styles. Additionally, higher Conscientiousness also contributes to a greater preference for task-oriented leadership style. These findings support the role of personality traits in shaping leadership preferences and contribute to the understanding of individual differences in leader–follower relationships.

Keywords: leadership; HEXACO; task-oriented; change-oriented; relationship-oriented

Introduction

Leadership is a process of influencing others in a way that enhances their contribution to achieving group goals and is considered as key to effective and efficient organizations (Haslam, 2012). Effective leadership depends on leader's personality traits and behaviours, with research indicating that behaviours play a more important role (DeRue et al., 2011). The same leader's behaviours may lead to different levels of effectiveness depending on situational factors and follower characteristics (House, 1996). Followers may differ in their perception of a leader's attractiveness, meaning that the same leader can motivate some while demotivating others (Shalit et al., 2010), affecting follower job satisfaction (Ehrhart & Klein, 2001; Yukl et al., 2019), commitment and job performance (Ehrhart & Klein, 2001).

One of the most comprehensive classifications of leadership behaviours is Yukl's taxonomy (Yukl et al., 2002) which distinguishes three categories: change-oriented, task-oriented, and relationship-oriented behaviours.

Change-oriented behaviour (Yukl et al., 2002; Yukl et al., 2019) is aimed to implement desirable organizational changes, and includes encouraging innovative thinking, intellectual stimulation and taking personal risks to implement change. Task-oriented behaviour (Yukl, 2002; Yukl et al., 2019) focuses on planning, clarifying roles, goals, and responsibilities and monitoring performance. Relationship-oriented behaviour (Yukl et al., 2002; Yukl et al., 2019) aims to build trust and commitment by supporting employees' needs, emotions, and development through coaching, praise, participation in decision-making, autonomy, and empowerment.

Previous research suggests that followers differ in their leadership style preferences depending on their personality traits (Breevaart & de Vries, 2021; Ehrhart & Klein, 2001; Ehrhart, 2012; Shalit et al., 2010; Thoroughgood & Sawyer, 2018). Some studies have interpreted these preferences through the principles of similarity and need fulfilment, suggesting that need fulfilment often playing a stronger role (Breevaart & de Vries, 2021; Ehrhart & Klein, 2001).

This study aimed to investigate whether individual differences in HEXACO personality traits predict preferences for leadership styles, from Yukl's taxonomy of leadership (Yukl et al., 2002; Yukl et al., 2019).

Based on the similarity principle, higher Extraversion and Openness to Experience were expected to predict preferences for change-oriented leadership. Higher Emotionality (need-fulfilment), higher Conscientiousness (similarity), and lower Openness to Experience (diversity) were expected to predict preferences for task-oriented leadership. Higher Emotionality (need-fulfilment) was expected to predict preferences for relationship-oriented leadership.

Method

Sample and Procedure

The convenience sample included 214 students from the University of Niš, 150 females and 64 males, aged 19 to 39 years (M = 23.05; SD = 3.364). Students were invited to participate in the study through a link to the questionnaires distributed by the faculty administrative services. Before completing the questionnaires, participants were informed that participation was voluntary and anonymous, that no compensation was provided, that they could withdraw from the study at any time, and that the data would be processed at the group level and used exclusively for scientific research purposes.

Instruments

The HEXACO-PI-R 60 (Ashton & Lee, 2009) was used to assess personality dimensions: Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience. The instrument consists of 60 items (10 per dimension), rated on a 5-point Likert scale (1- *strongly disagree* to 5 - *strongly agree*). Internal consistency were: Honesty-Humility (.77), Emotionality (.79), Extraversion (.79),

Agreeableness (.66), Conscientiousness (.81), Openness (.75).

Leadership preferences were assessed using **Yukl's taxonomy of leader behaviour (Yukl et al., 2002)**, which groups 12 behaviours into dimensions: Task-oriented, Change-oriented and Relation-oriented behaviour. The measure included 13 items (one "developing" behaviour split into task and relation components), rated on a 7 - point scale (1 - *to an extremely small extent*; 7 - *to an extremely large extent*). Internal consistency were: Task-oriented (.76), Change-oriented (.70), Relation-oriented (.78).

Results

To examine the predictive power of HEXACO personality traits in predicting preferences for each leadership style, regression analyses were conducted.

Results showed that (Table 1) higher levels of Emotionality and Openness to Experience contribute to a greater tendency to prefer change-oriented leadership. This model explains 12% of the variance. Higher levels of Emotionality, Conscientiousness, and Openness to Experience contribute to a greater tendency to prefer task-oriented leadership. This model explains 10% of the variance. Higher levels of Emotionality and Openness to Experience contribute to a greater tendency to prefer relationship-oriented leadership. This model explains 14% of the variance.

Table 1: Predictive models.

Change	β	*t*	*p*	Summary of the model
Honesty	-.00	-0.01	.994	R= .349, R^2
Emotionality	.17	2.52	.012	= .12
Extraversion	-.03	-.36	.717	F (8, 205) =
Agreeableness	.03	.41	.680	3.56
Conscientiousness	.02	.26	.796	p =.001
Openness	.26	3.82	.000	
Task	**β**	***t***	***p***	**Summary of the model**
Honesty	-.03	-0.40	.689	R=.312, R^2
Emotionality	.18	2.63	.009	= .097
Extraversion	-.10	-1.46	.146	F (8, 205) =
Agreeableness	.03	0.35	.728	2.75
Conscientiousness	.15	2.14	.034	p = .007
Openness	.16	2.40	.017	
Relationship	**β**	***t***	***p***	**Summary of the model**
Honesty	.10	1.38	.169	R=.373, R^2
Emotionality	.26	3.88	.000	= .14
Extraversion	.02	0.26	.794	F (8, 205) =
Agreeableness	-.02	-0.29	.769	4.14
Conscientiousness	.02	0.35	.729	p < .001
Openness	.19	2.89	.004	

Discussion

Results showed that Openness to Experience was positively associated with preference for change-oriented leadership, supporting our hypothesis and prior findings (e.g., Breevaart & De Vries, 2021). Individuals high in curiosity and creativity may prefer innovative leaders. Contrary to expectations and prior findings, showing that Extraversion is positively associated with charismatic (Yukl, 1999) and transformational leadership (Bono & Judge, 2004), which overlap with change-oriented, Extraversion was not related to preference for change-oriented leadership. Higher Emotionality was also associated with preference for change-oriented leaders. This finding may reflect a need-fulfilment mechanism, whereby emotionally sensitive followers perceive such leaders as a source of security, due to their confidence, enthusiasm, and charisma.

Consistent with the need-fulfilment principle, higher Emotionality was associated with stronger preference for task-oriented leaders. Structured decision-making may provide security for individuals prone to worry. This finding aligns with prior research (Breevaart & De Vries, 2021). In line with the similarity principle, Conscientiousness was positively related to preference for task-oriented leadership, suggesting that organized and goal-oriented individuals prefer structured leadership styles. Both findings support our expectations. Contrary to the diversity principle, and our expectations, Openness to Experience was also positively associated with task-oriented leadership preference. Highly open individuals may value structure when implementing creative ideas.

In line with the need-fulfilment principle, higher Emotionality was associated with stronger preference for relationship-oriented leaders, consistent with previous findings (Breevaart & De Vries, 2021; Dinić et al., 2023) and our expectations. Emotionally sensitive individuals may prefer supportive leaders who reduce anxiety and provide interpersonal security**.** Although not hypothesized, Openness to Experience was also positively related to preference for relationship-oriented leadership. Highly open individuals may value the autonomy and support provided by such leaders.

These findings highlight the role of individual differences in leadership style preferences and leader–follower fit. However, the findings should be interpreted with caution, as the sample consisted of students rather than employees and differences in work experience were not controlled.

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Role Ambiguity and Job Satisfaction: The Role of Positive Relationship Management

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Abstract

Role ambiguity refers to a lack of information regarding work tasks and responsibilities. Job satisfaction is defined as the extent to which an individual likes or dislikes their job, as well as their overall attitude toward the organization and its various aspects. This study examined the relationship between role ambiguity and job satisfaction, and the moderating role of Positive Relational Management (PRM), a job resource that enables individuals to adapt productively to workplace circumstances. The sample consisted of 100 participants (76% women) employed in office and administrative support positions in Serbia. Participants were recruited via LinkedIn and through a snowball sampling procedure. The study examined job satisfaction, role ambiguity, and PRM. Findings showed a negative association between role ambiguity and job satisfaction, and a positive association between PRM and job satisfaction. However, no moderating effect of PRM was found in the relationship between role ambiguity and job satisfaction. These findings underscore the importance of clearly defined job roles and highlight the need for organizations to develop precise job descriptions and targeted interventions aimed at reducing the negative effects of role ambiguity. The absence of a moderating effect represents an important direction for future research.

Keywords: job satisfaction; role ambiguity; positive relational management

Introduction

In modern work environments, increasing attention is devoted to factors influencing employee well-being. Current perspectives in positive psychology emphasize the importance of developing personal strengths and resources to promote mental health and work effectiveness (Bulińska-Stangrecka & Bagieńska, 2021; Peña, 2024; Haar et al., 2019). According to the Job Demands–Resources theory (JD–R; Demerouti et al., 2001; Bakker & Demerouti, 2016), employee well-being depends on the interplay between job demands and resources. While high job demands may negatively affect well-being, job resources can promote motivation and reduce adverse outcomes (Schaufeli, 2017). Similarly, the Conservation of Resources theory (COR; Hobfoll, 2001) identifies resource loss as a central mechanism underlying stress and job dissatisfaction, emphasizing the acquisition, maintenance, and accumulation of resources as critical for sustaining employee well-being (Haar et al., 2019).

Role ambiguity, defined as a lack of clarity regarding work tasks, responsibilities, and expectations, constitutes a salient job demand associated with reduced job satisfaction (Palomino & Frezatti, 2016; Singh & Rhoads, 1991). Job satisfaction reflects employees' overall evaluation of their work experience and is influenced by various aspects of the work environment, including organizational and interpersonal factors (Bellou, 2010; Spector, 1997). Positive Relational Management (PRM) represents a job resource reflecting employees' capacity to establish and maintain constructive interpersonal relationships, encompassing respect, caring, and connectedness (Di Fabio, 2016; Di Fabio et al., 2023). Previous research has shown that PRM is positively associated with job satisfaction (Bulińska-Stangrecka & Bagieńska, 2021), suggesting its potential role in mitigating the negative effects of role ambiguity.

Problem and objectives of the research

Although the negative effects of job demands are well established, the role of job resources in mitigating these effects remains less explored. This study examines the relationship between role ambiguity and job satisfaction, with a focus on the moderating role of Positive Relational Management.

Method

Sample and procedure

The sample consisted of 100 participants (76% women) employed in office and administrative support positions in Serbia. The mean age of participants was M = 37.29 years (SD = 11.61), while the average length of work experience was M = 12 years (SD = 9.71), with one year of work experience being the minimum inclusion criterion. The majority of participants had completed undergraduate studies (38%), and worked primarily from the office (73%). The questionnaire was administered using a snowball sampling procedure. Participants provided informed consent.

Instruments

Role ambiguity was assessed using the Role Ambiguity Scale (Bowling et al., 2017), consisting of six items, rated on a five-point Likert scale (from 1 = "strongly disagree"

to 5 = "strongly agree"). The Role Ambiguity Scale showed high reliability (α = .90). Job satisfaction was assessed using Spector's Job Satisfaction Survey (JSS; Spector, 1997; Mladenović & Petrović, 2015), consisting of 36 items across nine dimensions: pay, promotion, supervision, fringe benefits, contingent rewards, operating procedures, coworkers, nature of work, and communication. Items were rated on a seven-point Likert scale (from 1 = "strongly disagree" to 7 = "strongly agree"). The overall Job Satisfaction Survey showed excellent internal consistency (α = .93). Subscale reliabilities ranged from .64 to .82, except for Operating Procedures (α = .37). Positive relational management was measured using the Positive Relational Management Scale (Di Fabio, 2016), consisting of 12 items across three dimensions: respect, care, and connectedness, rated on a five-point Likert scale (from 1 = "strongly disagree" to 5 = "strongly agree"). The Positive Relational Management Scale showed high reliability (α = .82), with subscale reliabilities ranging from .60 to .75. Participants responded to five demographic questions (gender, age, years of work experience, workplace arrangement, and level of education), as well as to one attention-check item.

Data Analysis

All statistical analyses were conducted using IBM SPSS Statistics. Internal consistency of the instruments was assessed using Cronbach's alpha coefficients. Pearson's correlation analyses were performed to examine the associations between the study variables. Moderation analyses were using Model 1 of Hayes' PROCESS macro for SPSS (Hayes, 2013) to examine whether positive relational management moderated the relationship between role ambiguity and job satisfaction. Role ambiguity was treated as the predictor variable, job satisfaction as the outcome variable, and positive relational management as the moderator. The moderation effect was examined through the interaction between role ambiguity and positive relational management.

Results

Descriptive analyses showed that the distributions of scores across all scales and subscales exhibited mild to moderate deviations from normality. The results of the correlation analysis indicated that role ambiguity was significantly negatively associated with job satisfaction ($r = -.54$, $p < .01$). Positive relational management was positively associated with job satisfaction ($r = .39$, $p < .01$). The moderation analysis showed that the overall model was statistically significant, $F(3, 96) = 17.01$, $p < .001$, $R^2 = .35$, indicating that the model explained 35% of the variance in job satisfaction. However, the interaction effect between role ambiguity and positive relational management was not statistically significant ($b = -0.17$, $SE = 0.17$, $t = -0.98$, $p = .33$, 95% CI [−0.50, 0.17]). These findings indicate that positive relational management did not demonstrate a significant moderating effect on the relationship between role ambiguity and job satisfaction.

Discussion and Conclusion

The findings provide partial support for the assumptions of the JD–R model (JD–R; Demerouti et al., 2001; Bakker & Demerouti, 2016). Consistent with previous research, role ambiguity was negatively associated with job satisfaction (Palomino & Frezatti, 2016; Rogers, 1994). When employees lack clear information about their tasks, responsibilities, and expectations, their ability to develop positive attitudes toward their work may be impaired (Bellou, 2010; Singh & Rhoads, 1991; Van Eerde & Thierry, 1996). Positive relational management was positively associated with job satisfaction, consistent with previous findings (Bulińska-Stangrecka & Bagieńska, 2021), suggesting that constructive interpersonal relationships may contribute to a more positive work experience (Di Fabio et al., 2023). However, PRM did not moderate the relationship between role ambiguity and job satisfaction. Thus, although PRM may represent a valuable job resource in its own right, the present findings do not support its role as a buffer against the negative effects of role ambiguity. This finding suggests that the availability of a relational resource may not be sufficient to offset the effects of unclear work roles.

The generalizability of the findings may be limited by the specific occupational population sampled, cross-sectional design, self-report measures, and convenience sampling. Future research should examine whether these relationships generalize to occupations with different expected levels of role clarity, autonomy, and task structure. Theoretically, the findings contribute to understanding the relationship between job demands and job resources within the JD-R framework. Practically, they highlight the importance of clearly defined roles and responsibilities, as well as positive workplace relationships, in supporting employee job satisfaction and well-being.

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Cybervetting: Cognitive, Emotional and Behavioral Reactions Observed Among Serbia's Youth

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Abstract

Despite its growing use, "cybervetting" - i.e. reviewing online information about a job applicant - remains under-researched. The aim of this study was to analyze: Serbian youths' (aged 18-30) estimates regarding the prevalence of cybervetting in their country, their opinions and feelings towards this practice, and the types of online impression management they use in response to it. A mixed-method approach consisting of a questionnaire (N = 178) and semi-structured interviews (N = 10) was used. Questionnaire results indicated that nearly half of surveyed youths consider cybervetting to be a rare or non-existent practice in Serbia. The largest number had neutral emotional reactions and views on its ethics, with negative assessments being more common than positive ones. Nearly three-quarters of the sample denied shaping their online profiles to appeal to potential employers. Thematic analysis revealed that participants held positive, negative and conditionally positive opinion patterns regarding cybervetting. Emotional reactions could also be positive or negative, whereas in some participants they were entirely absent. Four main approaches to impression management were observed, namely the 'acceptor', 'dissident', 'scrubber' and 'strategist' approaches earlier identified by Berkelaar (2017), with slight differences emerging between her subtypes and those found in this study.

Keywords: cybervetting; selection; impression management; social media; young people

Introduction

Cybervetting refers to "the widespread practice of employers culling information from social media and/or other internet sources to screen and select job candidates" (Wilcox et al., 2022, p. 315). Previous research suggests that when cybervetting, companies are mainly looking for so called *red flags* that suggest a potentially risky hire (lewdness, dishonesty etc.), but also positive qualities and signs of professionalism (McDonald et al., 2022). The platforms most used for cybervetting are LinkedIn and Facebook, though more unexpected platforms like Pinterest (Hartwell & Campion, 2020), classifieds and auction sites, gaming sites etc. (Cross-Tab Transforming Market Research, 2010) are also used.

Research regarding the prevalence of this practice shows that anywhere between 43% (Maurer, 2016) and 98% (Cross-Tab Transforming Market Research, 2010) of HR professionals use it. A study from neighboring Bosnia found that 48.4% of surveyed firms use social media to gather candidate data (Lesko Bošnjak & Mabić, 2019).

As for people's estimates regarding cybervetting's prevalence, some studies suggest that as many as 80% of students feel that prospective employers are likely or very likely to check applicants' Facebook profiles (Root & McKay, 2014). Other studies report that only 7% of people believe online information about them has affected their job search (Cross-Tab Transforming Market Research, 2010).

Attitudes towards cybervetting seem to be predominantly negative across different cultures (Akbulut et al., 2024; AlZamel & Al-Jabri, 2021; Berkelaar, 2014; Jacobson & Gruzd, 2020; Roulin & Liu, 2023; Stoughton et al., 2015), though some studies indicate more moderate opinions (Folger et al., 2021; Root & McKay, 2014).

A study by Berkelaar (2017) identified four approaches to online impression management: *acceptors* who take no action in response to cybervetting due to expecting a positive evaluation (willing subtype) or seeing it as inevitable (reluctant subtype), *dissidents* who choose online invisibility, *scrubbers* who temporarily deactivate their accounts (temporary deactivation subtype) or delete problematic information (sanitation subtype), and *strategists* who create multiple accounts (alter-ego), or apply their communicative (communicative subtype), technical competencies (technological subtype) or both (super-strategist) to manage online impressions.

Research objectives

This study had three research objectives:

1) Assessing youths' estimates regarding the prevalence of cybervetting in Serbia
2) Understanding their opinions and feelings about the practice
3) Gaining insight into whether they utilize online impression management strategies as a result of it (and if so, which ones)

Method

Participants and procedure

In accordance with its research goals, this study utilized a mixed method approach. A total of 178 Serbian young adults aged 18-30 (M_{age} = 23.89; SD = 3.53; 72.5% female), recruited via social media using the snowball technique, participated in the questionnaire phase. The age range was based on the legal definition of youth in Serbia (15-30 years), with the lower limit set at 18 to include adults only, as they were more likely to be seeking employment and reflecting on cybervetting. The questionnaire focused primarily on accomplishing the first research objective, but also included several questions pertaining to the other two. A sequential approach was used, with semi-structured interviews conducted after the questionnaire phase to better address the last two research goals. Ten youths (M_{age} = 25.4; SD = 3.06; 50% female) were selected for the interviews based on answers they gave in the quantitative part of the study. Special attention was paid to ensuring maximum variability in terms of gender, age, lived experiences and opinions.

Instruments

A 20 item questionnaire was constructed with the main aim of assessing estimates regarding the prevalence of cybervetting in Serbia. A few items focusing on subjects' social media usage, experience with cybervetting, opinions and feelings on the practice, online impression management etc. were included. The questionnaire featured binary-choice, Likert-scale, and multiple-choice questions. No multi-item scales were used.

An interview guide with 14 questions was also constructed. The questions aimed at acquiring a deeper understanding of participants' feelings and thoughts on cybervetting, as well as their behavioral responses to it.

Data Analysis

Questionnaire responses were analyzed at the item level using descriptive statistics, Chi-square, Mann–Whitney U, and Kruskal–Wallis tests, as appropriate to data type and analytical objectives. No composite scores were calculated.

No qualitative data analysis software was used. Interview data were analyzed using thematic analysis. While a fully inductive approach was adopted for the second research objective, a combined inductive–deductive approach was used for the third. Here, themes corresponding to Berkelaar's (2017) typology emerged during the initial coding, and subsequently informed the coding process. However, the analyst remained open to themes from the typology not appearing in the data, as well as to the emergence of additional themes.

Findings

Questionnaire results indicate that the largest percentage of subjects believe cybervetting to be rare, but used by some recruiters in Serbia (38.2%). The remaining responses were distributed as follows: used by many recruiters, but less than half (19.1%), about an equal number of them use it and don't use it (16.3%), more use it than don't use it (14%), almost all use it (6.2%) and it's not present at all (also 6.2%). Due to a lack of data on the actual prevalence of cybervetting in Serbia, the accuracy of these perceptions is unknown.

The majority of participants had neutral emotions at the thought that they could be cybervetted (58.9%). Negative emotions were more common than positive ones (more negative than positive – 22.5%, entirely negative – 7.9%, more positive than negative – 7.3%, entirely positive – 3.4%). Those under the age of 25 had more negative emotional reactions ($Z = -2.44$, $p < .05$).

A similar pattern emerged when it came to opinions on the ethics of cybervetting, with neutral views being the most frequent (46.6%), and negative stances outnumbering positive ones (more unethical than ethical 33.1%, entirely unethical 7.9%, more ethical than unethical 9%, entirely ethical 3.4%). Compared with findings from other countries, young Serbians in this sample seemed to exhibit more neutral attitudes (AlZamel & Al-Jabri, 2021; Roulin & Liu, 2023; Stoughton et al., 2015).

Consistent group differences were found between participants with different experience levels be it: work experience (emotions: $Z = -2.05$, $p < .05$), being cybervetted (emotions: $Z = -2.32$, $p < .05$, ethics: $Z = -3.55$, $p < .01$), cybervetting (emotions: $Z = -2.97$, $p < .01$) or knowing someone who was cybervetted (ethics: $Z = -2.76$, $p < .01$). Those without these experiences reacted more negatively, perhaps due to fear of the unknown or less frequent use of impression management measures. These interpretations are, of course, purely speculative.

Nearly three-quarters (74.2%) of the sample denied shaping their online profiles to appeal to potential employers. A similar percentage believed that they had never posted anything a potential employer might not like (72.8%). It is perhaps unlikely that so many people have never made a post that may be viewed as problematic by at least some employers. One possible explanation is that some were simply unaware of the types of posts that could elicit negative perceptions. Women ($\chi^2(1, 173) = 22.09$, $p < .01$) and high schoolers ($\chi^2(2, 169) = 8.09$, $p < .05$) were more likely to state they had never posted anything a potential employer might not like (93.3% of high schoolers made this claim).

Thematic analysis of interview transcripts revealed three main opinion patterns regarding cybervetting. Positive ones arose from seeing it as useful for the candidate and/or the employer. Negative ones resulted from perceiving it as useless or questionable in terms of its values and ethics. Conditionally positive opinion patterns allowed for a more nuanced view of cybervetting as acceptable in some situations (if used only for certain professions, if only certain social networks are used etc.) but not in others.

Emotional reactions observed in interviews could also be positive (understanding, feeling flattered) or negative (anger, fear, shame, disappointment etc.), while some participants felt no emotions at all.

The four approaches to online impression management identified in Berkelaar's (2017) prior work were also found in this study. Still, some differences were observed

between her subtypes and those found in our study. Her technological strategist was not present among this study's participants. Her reluctant acceptor was replaced by the *ignorant acceptor* who takes no action due to being unaware of cybervetting's existence („*I haven't thought about it at all. So no [I don't take any measures]*"). New subtypes for the dissident and the scrubber were also noted. These were the *observer,* who has social media profiles but uses them only to follow others (*„I have one profile, but I don't post anything, I just stalk people"*), and the *hider,* whose main approach is posting problematic content on Instagram stories visible for 24h or using privacy settings ("*I just keep my profile private. Sometimes I just post it on my story. Maybe even for close friends only*").

Future research should: include populations not represented in this study, investigate the actual prevalence of cybervetting in Serbia and recruiters' perspectives on it.

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Perception of Political Anomie and RWA as Predictors of the Conspiracy Mentality

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Abstract

Conspiracy mentality has been linked to perceptions of societal and political instability, but its associations with perceived political anomie and right-wing authoritarianism warrant further investigation. This study examined the relationships between these constructs in a Serbian sample of 448 participants drawn from a secondary dataset. Participants completed the Conspiracy Mentality Questionnaire (CMQ), the Perception of Anomie Scale (PAS), and the Right-Wing Authoritarianism Scale (RWAS). Multiple linear regression analysis showed that perceived political anomie was a positive predictor of conspiracy mentality, whereas right-wing authoritarianism was a negative predictor. The model explained a proportion of the variance in conspiracy mentality, with perceived political anomie accounting for a larger share of the explained variance than right-wing authoritarianism. These findings highlight the differing associations of the two constructs with conspiracy mentality in this sample. Future research could examine whether these associations vary across cultural contexts and investigate additional theoretical predictors of conspiracy mentality.

Keywords: Conspiracy Mentality, Perception of Political Anomie, Right-Wing Authoritarianism, Cultural Differences

Introduction

Conspiracy mentality has gained scholarly attention due to its links to prejudice, institutional distrust, and lower compliance with public health guidelines (Bruder et al., 2013), highlighting the importance of understanding its psychological and social correlates. Among the factors potentially associated with conspiracy mentality are perceived political anomie and right-wing authoritarianism (RWA), which represent distinct but theoretically relevant constructs. Perceived political anomie refers to the perception that political and societal systems are dysfunctional, unstable, or unable to uphold shared norms and expectations. Previous research has linked perceptions of anomie and societal dysfunction to conspiracy beliefs, suggesting that conspiratorial explanations may provide a sense of meaning and control when the social environment is perceived as unpredictable or threatening (Abalakina-Paap et al., 1999; Goertzel, 1994; Imhoff & Bruder, 2014; Teymoori et al., 2016; Enders et al., 2023). Perceived political anomie may therefore be particularly relevant to understanding conspiracy mentality because it concerns individuals' evaluations of the functioning of political and societal systems. Right-wing authoritarianism represents a different dimension, encompassing submission to established authorities, aggression toward those who violate conventional norms, and adherence to traditional values (Altemeyer, 1981). Its relationship with conspiracy mentality, however, remains inconsistent across studies, with findings ranging from weak or positive associations to negative ones (Đorđević et al., 2021; Farkhari et al., 2022; Imhoff & Bruder, 2014). Two competing mechanisms may help explain these differences. Authoritarian threat sensitivity may increase conspiracy beliefs by heightening perceived danger (Duckitt & Sibley, 2010, as cited in Farkhari et al., 2022), whereas deference to authority may reduce them when authorities are accused of wrongdoing (Wood & Gray, 2019). These mechanisms may operate differently depending on whether the outcome is general conspiracy mentality or endorsement of specific conspiracy theories, particularly when the latter target authorities with whom individuals identify. Perceived political anomie and RWA may thus be associated with conspiracy mentality for different reasons: the former concerns perceptions of systemic dysfunction, whereas the latter reflects individual differences in attitudes toward authority, social norms, and conventionalism. Examining perceived political anomie and RWA simultaneously allowed their unique associations with conspiracy mentality to be assessed while accounting for shared variance. Accordingly, **this study examined their relative contributions to individual differences in conspiracy mentality in a Serbian sample, without assuming causal relationships**.

Method

Participants

The study used secondary data collected in May 2017 from a representative sample of Serbian adults aged 18 and older. Of the original 1,258 participants, 448 with complete responses were included. The sample comprised 58.9% men and 41.1% women, aged 18–69 years (M = 41.35, SD = 10.79). Regarding education, 5.8% had primary education or less, 59.2% secondary education, 34.4% a university degree, and 0.6% doctoral education. Years of education ranged from 7 to 20 (M = 13.36).

Instruments

Conspiracy mentality was measured using the five-item Conspiracy Mentality Questionnaire (CMQ; Bruder et al., 2013). Items were rated from 1 (certainly false) to 11 (certainly true), with higher scores indicating stronger conspiracy mentality (Cronbach's α = .83). RWA was assessed using the nine-item Right-Wing Authoritarianism Scale (RWAS; Todosijević, 2013). Responses ranged from 1 (completely agree) to 4 (completely disagree). Items were recoded so that higher scores consistently indicated greater RWA (Cronbach's α = .90). Political anomie was measured using the eight-item Perception of Anomie Scale (PAS; Teymoori et al., 2016). Items were rated from 1 (completely disagree) to 5 (completely agree), with higher scores indicating stronger perceived political anomie (Cronbach's α = .93).

Procedure

The analyses used the existing dataset collected through a questionnaire in May 2017. No new data were collected. Only participants with complete responses to all study variables were included.

Variables

Conspiracy mentality was the criterion variable, while political anomie and RWA were the predictor variables.

Results

Multiple linear regression was used, with political anomie and RWA as predictors of conspiracy mentality. Results are presented in the tables below.

Table 1: Descriptives of Main Constructs.

	M	*SD*
Conspiracy Mentality	8.02	2.09
Perception of Political Anomie	4.09	.987
Right-Wing Authoritarianism	2.45	.820

Table 2: Summary Results of a Multiple Linear Regression.

Predictors	*B*	*SE*	*β*	*t*	*p*	Zero-order
Perception of Political Anomie	.755	.094	.356	8.023	< .001	.325
Right-Wing Authoritarianism	-.510	.113	-.200	-4.500	< .001	-.144

Note. N = 448; Criterion: Conspiracy Mentality

The overall regression model was statistically significant, $F(2, 445) = 37.59$, $p < .001$, explaining 14.5% of the variance in conspiracy mentality ($R^2 = .145$; adjusted $R^2 = .141$). Perceived political anomie was a significant positive predictor of conspiracy mentality ($\beta = .356$, $p < .001$), meaning higher levels of perceived political anomie were associated with higher levels of conspiracy mentality, while controlling for RWA. RWA was also a significant predictor of conspiracy mentality, but a negative one ($\beta = -.200$, $p < .001$). Higher levels of RWA were associated with lower levels of conspiracy mentality, while controlling for perceived political anomie.

Discussion and Conclusion

This study examined the associations of perceived political anomie and RWA with conspiracy mentality in a Serbian sample. Perceived political anomie was a significant positive predictor of conspiracy mentality, explaining unique variance beyond RWA. This suggests that greater perceived anomie is associated with stronger conspiratorial thinking, consistent with previous research. For instance, Salvador Casara et al. (2022) found that the relationship between economic inequality and conspiracy beliefs is mediated by anomie, with their findings indicating that higher perceived inequality was associated with greater perceptions of societal breakdown, which were, in turn, associated with stronger conspiracy beliefs. Similarly, Jetten et al. (2022) argue that anomie undermines feelings of control, meaning, and social belonging, which may be related to greater endorsement of conspiracy beliefs as a way of coping with uncertainty (Fritsche et al., 2017, as cited in Jetten et al., 2022). Previous studies have also linked perceptions of anomie and societal dysfunction to conspiracy beliefs (Abalakina-Paap et al., 1999; Adam-Troian et al., 2023; Goertzel, 1994; Imhoff & Bruder, 2014). In contrast, RWA was a significant negative predictor of conspiracy mentality, with higher levels of RWA associated with lower conspiracy mentality in the present sample. However, the correlational design precludes conclusions about the direction or causal nature of this relationship (Imhoff & Bruder, 2014). This finding may be understood in light of Wood and Gray (2019), who found that RWA was strongly associated with pro-establishment conspiracy theories, whereas its association with anti-establishment theories was inconsistent. Their findings suggest that the relationship between RWA and conspiracy beliefs may depend on the specific content and political orientation of the theories. Although the present study examined conspiracy mentality more broadly, these

findings suggest that the association between RWA and conspiratorial thinking may vary across contexts.

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Free Speech-to-Text Software for Serbian: A Step-by-Step Tutorial and Evaluation Using Noisy Interview Recordings

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Abstract

This technical note presents and evaluates a free workflow for automatic speech recognition (abbr. ASR) in Serbian using OpenAI's Whisper large-v3 model in Google Colab. A short step-by-step tutorial makes the workflow accessible to users without programming experience. Performance was evaluated for a typical research setting – interviews recorded in noisy environments. Whisper was compared with manual transcription and the paid service (Scribe v2 by ElevenLabs) in an experimental design using nine randomly sampled excerpts from genuine interviews. Evaluation focused on accuracy, the proportion of errors that altered meaning, and the time required to obtain a fully accurate transcript. Whisper achieved a mean Word Error Rate of .20, meaning that approximately every fifth reference word was affected by an insertion, deletion, or substitution, and was less accurate than ElevenLabs. Both ASR systems produced meaning-altering errors and therefore human verification against the original audio is essential. Nevertheless, correcting machine-generated transcripts required substantially less time than manual transcription. Because the workflow relies on online infrastructure, the paper also addresses data retention considerations and the ethical use of cloud processing for confidential or identifiable recordings. Evaluation findings support a human-in-the-loop approach for Whisper ASR in Google Colaboratory, while considering data sensitivity, time, and cost.

Keywords: Whisper; Automatic Speech Recognition; Transcription; Word Error Rate; Human in the Loop

Introduction

Transcription is a time-consuming part of research based on recorded speech, while automatic speech recognition (abbr. ASR) may substantially reduce this burden. ASR services such as ElevenLabs *Scribe v2* (ElevenLabs, n.d.–a) is currently advertised by the company as its most accurate speech-to-text model (ElevenLabs, n.d.–b) - delivering a word error rate (abbr. WER) of just 5.5%. Reported WER's meaning is that approximately 5.5% words in transcripts was affected by an insertion, deletion, or substitution. However, it is proprietary.

ASR called *Whisper* appears as an open-source alternative, meaning that it can be run by anyone, free of charge. It is developed by OpenAI, with large-v3 as its most capable model version delivering a 15.7% WER (OpenAI, n.d.). Downside of the Whisper ASR is that one must be comfortable with coding to run it.

This technical note, therefore, has two aims. The first aim is to showcase a workflow I have developed to make free ASR more accessible to users without programming experience.

The second aim is to evaluate how well this free solution performs in realistic interview conditions containing background noise. Advertised WER is based on Common Voice, a crowdsourced dataset of read speech, and therefore provides limited information about performance in interview conditions. Therefore, I compared free Whisper large-v3 with paid ElevenLabs Scribe v2 in terms of accuracy, types of errors, and the time required to obtain an accurate transcript, the last one particularly compared to time that manual transcription demanded.

Method

A free workflow with a step-by-step tutorial

I have built the workflow with three features which make it accessible: (1) it runs online, removing the need for powerful personal hardware; (2) it uses ready-made code requiring only minimal user adjustments; and (3) it includes a step-by-step video tutorial on uploading audio, running the code, and downloading the transcript.

ASR Evaluation

Design and procedure. The evaluatory study used an experimental design. The same nine audio excerpts were processed using three transcription conditions: free ASR (Whisper large-v3), paid ASR (ElevenLabs Scribe v2), and manual transcription. The same researcher corrected both ASR outputs and manually transcribed every excerpt in Microsoft Word, without professional transcription equipment. Correction continued until the transcript matched the audio.

Materials. The material consisted of 1% randomly sampled segments from interviews with nine participants ($N = 9$ stimuli lasting around 36 seconds each). Interviews came from a real social-science study and each of them was professionally recorded in a noisy setting, including outdoor location, café, or an area near public gatherings.

Measures. Accuracy was quantified with WER, calculated by comparing each raw ASR transcript with its fully corrected version.

Types of errors that both ASR systems made were also coded. Twenty error types were identified inductively and classified according to whether they were likely to alter utterance meaning (Appendix A). Meaning-altering errors included omitted words or sentences and substitutions that changed lexical meaning (for example *plan* instead of *plenum*); non-meaning-altering errors included obvious repetition of sentences, omitted fillers, incorrect grammar,

missing quotation marks, and some quiet interviewer acknowledgements. For each excerpt we calculated the proportion of errors classified as meaning-altering.

Transcription effort was expressed as the ratio of manual transcription duration or correction duration to audio excerpt duration.

Results

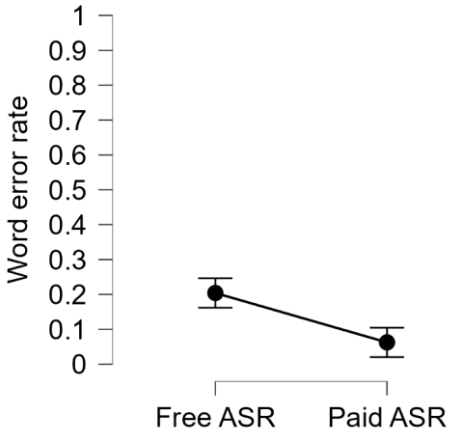
A free workflow with a step-by-step tutorial

An accessible workflow in Google Colaboratory, ready to be saved to one's one Google Drive and subsequently used, is available at this link: https://colab.research.google.com/drive/1Ob6qZgiwnLLQYPOkkE39I5jsgX-GR82O?usp=sharing.

ASR Evaluation

Free ASR produced more word-level errors than paid ASR in one-tailed paired samples t-test ($t(8) = 5.47$, $p < .001$, Cohen's $d = 1.82$; see Figure 1). Mean WER was .20 (SD = .08) for free and .06 (SD = .03) for paid one.

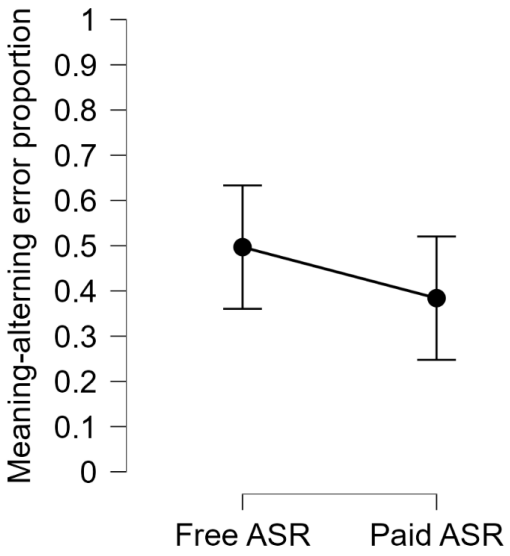
Figure 1: Comparison in accuracy across ASR systems.
Note. Error bars represent 95% confidence intervals.



The proportion of errors classified as meaning-altering was .50 (SD = .16) for free ASR and .38 (SD = .33) for paid ASR (see Figure 2). This difference was not statistically reliable in a one-tailed paired-samples t-test, ($t(8) = 1.35$, $p = .107$, Cohen's $d = 0.45$). While the non-significant difference may reflect a lack of statistical power to catch the difference – conclusion is the same: meaning-altering errors occurred within both ASR systems.

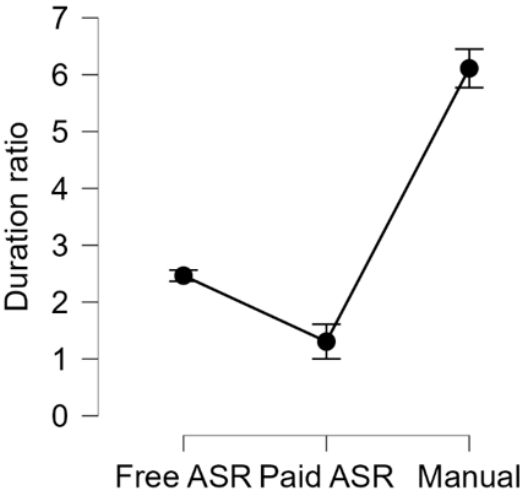
Transcription effort differed strongly across approaches, $F(2, 16) = 86.64$, $p < .001$, $\eta^2 = .92$. Manual transcription required the most time relative to audio duration (M = 6.11, SD = 1.80), followed by free ASR correction (M = 2.47, SD = .91) and paid ASR correction (M = 1.31, SD = .50). See figure 3. Bonferroni-adjusted comparisons showed that all three conditions differed significantly ($p \leq .008$).

Figure 2: Comparison of the proportion of meaning-altering errors across ASR systems.



Note. Error bars represent 95% confidence intervals.

Figure 3: Comparison in transcription effort between ASR systems and manual transcription.



Note. Error bars represent 95% confidence intervals.

Discussion

The findings show a trade-off between cost, accuracy and researcher time demanded for transcription of interviews recorded in noisy environments. ElevenLabs paid ASR was more accurate and required less correction time than the free Whisper ASR, while correcting Whisper transcript was reasonably accurate and its correction was faster than transcribing from scratch. Overall, findings support a human-in-the-loop approach meaning that human verification of transcript provided by any ASR is necessary.

The evaluation is limited by measuring transcription duration for a single researcher, as differences between ASR correction and manual transcription duration interact with individual characteristics. This limitation is less

relevant to correcting and classifying errors, which are less dependent on individual differences. Findings should not be generalized to focus groups or recordings with extensive overlapping speech.

However, convenience must be weighed against research ethics. Researchers should check data-retention policies of cloud-based services - Google Colab and ElevenLabs - and compare them to institutional policies regarding data management of confidential data.

Conclusion

The Colab notebook and tutorial are intended to make reasonably accurate no-cost transcription in Serbian more accessible, while encouraging an informed choice of using a cloud-based service regarding the confidentiality of audio files.

Acknowledgments

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Appendix

Table A1: Error type and corpus example.

Non-meaning-altering errors
Punctuation error (*tu ali* instead of *tu, ali*).
Missing punctuation in a longer segment.
Missing quotation marks in direct speech.
Omitted repetition/false start (*dobro* instead of *do-dobro*).
Omitted filler ([none] instead of *znači*).
Omitted backchannel ([none] instead of *mhm*).
Incorrect Ijekavian form (*negdje* instead of *negde*).
Incorrect grammatical form (*koliziji* instead of *koliziju*).
Meaning-altering errors
Unusual pronunciation (*obiština* instead of *opština*).
Letter substitution (*protipožarni* instead of *protivpožarni*).
Proper-name error (*Maksi* instead of *Maxi*).
Omitted meaningful word/sentence (*studentski...* instead of *studentski... plenum*).
Similar-sounding substitution (*planina* instead of *plenum*).
Incorrect splitting/merging (*malo prepitali* instead of *malopre pitali*).
Merged preposition (*ustvari* instead of *u stvari*).
Inserted unspoken/background speech.
Repeated sentence.
Repeated sentence instead of actual continuation.

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Do Authoritarianism and Trust in Science Predict Conspiracy Mentality and in What Way?

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Abstract

The study examines the relationship between authoritarianism, trust in science, and conspiracy mentality. The aim of the study was to determine whether authoritarianism and trust in science are significant predictors of conspiracy mentality, whether there is a relationship between authoritarianism and trust in science, and which of these two factors has greater predictive power. The stratified sample consisted of 1,039 participants from Serbia, all over the age of 18. The study used a questionnaire administered by the Institute of Political Studies in Belgrade in November 2017. The results showed that higher levels of authoritarianism were associated with a more pronounced conspiracy mentality, while higher levels of authoritarianism were associated with lower trust in science. In contrast, trust in science was not significantly associated with conspiracy mentality. The findings further indicated that authoritarianism had greater predictive power in explaining conspiracy mentality than trust in science. The low internal consistency of the trust in science scale may have attenuated its associations with other variables and should therefore be considered when interpreting the findings. Overall, the results highlight the importance of authoritarianism in understanding individual differences in conspiracy mentality.

Keywords: authoritarianism, trust in science, conspiracy mentality, ideological orientation, Serbia

Introduction

Conspiracy mentality describes the propensity to subscribe to theories blaming ill-intending individuals or groups for important societal phenomena (Swami et al., 2010). Among the factors associated with conspiracy mentality, authoritarianism and trust in science have been particularly highlighted (Synak et al., 2024). Authoritarianism is defined as a personality dimension consisting of authoritarian submission, aggression, and conventionalism (Altemeyer, 1996). Individuals with stronger authoritarian attitudes tend to demonstrate a greater need for clear hierarchies, resistance to change, and acceptance of simplified explanations of social events, which may increase susceptibility to conspiracy theories (Kavanagh, 2020; Giry & Gürpinar, 2020). Previous research has consistently demonstrated a positive association between authoritarianism and conspiracy mentality across social and cultural contexts (Farkhari et al., 2022; Synak et al., 2024). Research has also found that individuals with higher authoritarianism and social dominance exhibit fewer shared values with scientists and perceive scientists as a threat to hierarchical systems and authorities (Kerr et al., 2021). Such attitudes may contribute to distrust in science and rejection of scientific knowledge (Kerr et al., 2021). Trust in science refers to the extent to which individuals accept the legitimacy of the scientific approach and perceive science as a reliable source of knowledge (Dagnall et al., 2019). Previous findings suggest that trust in science is an important factor against conspiratorial beliefs and a significant predictor of conspiracy mentality (Vranic et al., 2022; Synak et al., 2024). Based on theoretical and empirical findings, the question arises as to how authoritarianism and trust in science contribute to explaining individual differences in conspiracy mentality. Although relationships between these constructs have been confirmed internationally, their association remains insufficiently examined in the domestic context. Therefore, it is important to investigate whether the same patterns can be observed in a Serbian sample. The aim of the present study was to examine the relationship between authoritarianism, trust in science, and conspiracy mentality, as well as whether authoritarianism and trust in science predict conspiracy mentality and which is the stronger predictor. The following hypotheses were proposed: (H1) there will be a statistically significant negative correlation between trust in science and conspiracy mentality; (H2) authoritarianism will be positively associated with conspiracy mentality; (H3) authoritarianism will be negatively associated with trust in science; and (H4) authoritarianism will be a stronger predictor of conspiracy mentality than trust in science.

Method

The research was conducted using a non-experimental method and a correlation-regression design.

The sample consisted of 1,039 participants from Serbia, aged 18 to 89 years (M = 41.87, SD = 14.70). A questionnaire administered by the Institute of Political

Studies in Belgrade in November 2017 was used for the study. A stratified random sample was used. The sample included more men (51.4%) than women.

Authoritarianism and trust in science were predictors, while conspiracy mentality was the criterion variable. All variables were quantitative and measured on a 1–5 Likert scale. The authoritarianism (α = .92) and conspiracy mentality (α = .84) scales showed high reliability, while trust in science had lower reliability (α = .51). Data were analyzed in SPSS 26.0. Descriptive statistics, reliability, and normality were assessed. Pearson's correlation examined relationships among variables, while multiple and hierarchical regression assessed prediction and the individual contribution of each predictor to the variance in conspiracy mentality.

Results

The first hypothesis, assuming a negative correlation between conspiracy mentality and trust in science, was not supported, as the correlation was not significant ($r = -.019$, $p = .545$). The second hypothesis was supported: authoritarianism was significantly and positively associated with conspiracy mentality ($r = .128$, $p < .001$). The third hypothesis was also supported, with a significant negative correlation between authoritarianism and trust in science ($r = -.116$, $p < .001$).

Multiple linear regression showed that authoritarianism and trust in science significantly predicted conspiracy mentality ($p < .001$), explaining 1.6% of the variance ($R^2 = .016$).

Hierarchical regression was used to examine whether the addition of specific predictors changed the percentage of explained variance in the criterion variable and which predictor made a greater contribution to its prediction. As shown in Tables 1 and 2, Model 1, which included only authoritarianism, was statistically significant, $F(1, 1037) = 17.312$, $p < .001$, and explained 1.6% of the variance in the criterion variable, $R^2 = .016$. Adding trust in science in Model 2 did not result in an increase in explained variance, $\Delta R^2 = .000$, as shown in Table 1. Table 3 shows that trust in science did not make a significant unique contribution ($\beta = -.004$, $t = -.129$, $p = .897$), whereas authoritarianism made a statistically significant contribution to the prediction of conspiracy mentality ($\beta = .128$, $t = 4.116$, $p < .001$). Therefore, the fourth hypothesis was supported.

Table 1: Hierarchical Regression Analysis.

Model	R	R Square	Adjusted R Square	R Square Change	F Change	Sig. F Change
1	.128	.016	.015	.016	17.312	.000
2	.128	.016	.015	.000	.017	.897

Table 2: ANOVA.

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	75.293	1	75.293	17.312	.000
Residual	4510.143	1037	4.349		
Total	4585.436	1038			
2 Regression	75.366	2	37.683	8.656	.000
Residual	4510.070	1036	4.353		
Total	4585.436	1038			

Table 3: Regression Coefficients, Partial and Semi-Partial Correlations, t-tests, and Significances.

	Unstandardized Coefficients		Standardized Coefficients			Correlations	
	B	Std.Error	Beta	t	Sig.	Partial	Part
1 (Constant)	7.220	.230		31.330	.000		
Authorit.	.337	.081	.128	4.161	.000	.128	.128
2 (Constant)	7.266	.424	.128	17.120	.000		
Authorit.	.336	.082	.004	4.116	.000	.127	.127
Trust in Science	-.012	.092		-.129	.897	-.004	-.004

Discussion and Conclusion

The aim was to examine relationships between authoritarianism, trust in science, and conspiracy mentality, and to determine whether authoritarianism and trust in science predict conspiracy mentality and which is the stronger predictor. The results showed a significant positive association between authoritarianism and conspiracy mentality, consistent with previous research (Synak et al., 2024; Kerr et al., 2021). A significant negative association between authoritarianism and trust in science was also found, confirming the third hypothesis. This may indicate that lower trust in science is associated with higher levels of right-wing authoritarianism. (Synak et al., 2024). The expected negative association between trust in science and conspiracy mentality was not confirmed. However, this finding should be interpreted cautiously due to the low reliability of the Trust in Science scale (α = .51). Hierarchical regression showed that RWA was a stronger predictor of conspiracy mentality than trust in science. The weaker predictive role of trust in science may partly reflect its low reliability. In contrast, the stronger association between RWA and conspiracy mentality may potentially be explained by the theoretical emphasis on perceptions of the social world as threatening and a preference for authority and social order, although this interpretation remains tentative and warrants further

investigation. (Synak et al., 2024). A main limitation was the low reliability of the Trust in Science scale, requiring caution when interpreting findings involving this variable. Other limitations include self-report measures, socially desirable responding, and the correlational-regression design. Moreover, the small correlations and lower explained variance in this large sample suggest that the findings should be interpreted cautiously. A strength was the large stratified sample, with approximately equal representation of men and women. Future research should use a more reliable measure of trust in science, examine the relationship between authoritarianism and conspiracy mentality, and include samples from different cultural contexts.

In conclusion, authoritarianism was significantly positively associated with conspiracy mentality and was a stronger predictor than trust in science. Although the expected association between trust in science and conspiracy mentality was not confirmed, further research using a more reliable measure is needed.

Acknowledgments

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"Braća Jugosloveni": The role of personal contact and nationalism in predicting negative stereotypes about other nations

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Abstract

Less personal contact can result in more negative stereotypes about different outgroups with nationalism serving as a potential mediator. People who perceive others as threatening and inferior might have less contact with "others" and hold more negative representations of them, explaining how less contact translates to negative attributions and representations. Because contact between members of different Yugoslav nationalities, especially for youth, seems less intensive after its dissolution, we wanted to test the proposed mechanism as it relates to Slovenians' attitudes toward nations of the former Yugoslavia and test whether patriotism can moderate the proposed relationship. Using data from a large sample of Slovenian residents, we found that less personal contact was consistently linked with higher nationalism and nationalism, in turn, to more negative stereotypes, even if personal contact was independent from stereotype positivity. Patriotism moderated the relationship between personal contact and nationalism only in relation to Croatians, but contrary to expectations, higher patriotism strengthened this relationship. Taken together, the results paint a more complex picture of the relationship between studied constructs and suggesting that they are best understood as interconnected and embedded in specific sociocultural contexts

Keywords: stereotypes; nationalism; patriotism; intergroup contact; Southeastern Europe

Introduction

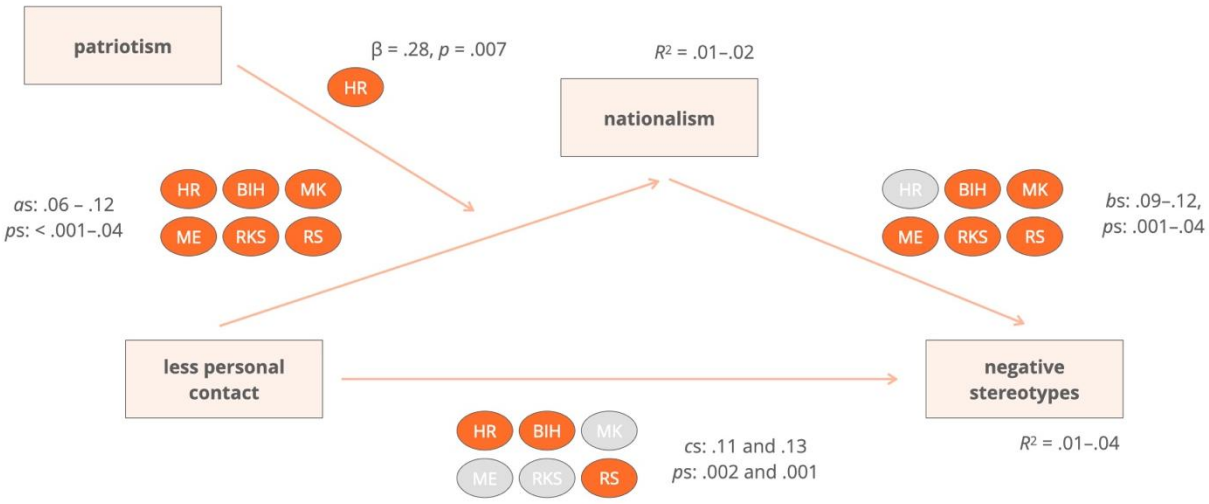
According to the contact hypothesis, reduced intergroup contact may contribute to more stereotypes towards other groups (Pettigrew & Tropp, 2006). In absence of personal experience, people are more likely to rely on generalized – positive or negative – representations that may be biased and shaped by motives underlying intergroup comparison (Collins et al., 2006). The former Yugoslavia provides a particularly useful context for examining these processes. Contact among people from different republics was relatively common through shared political, educational, economic, and cultural institutions in Yugoslavia. Following its dissolution, however, particularly younger generations had fewer opportunities for direct contact with people from other republics, resulting in substantial variability in cross-national contact.

Contemporary uncertainty may increase perceptions of outgroups as threatening while motivating individuals to maintain a positive image of their nation (Guerra et al., 2026; Konur et al., 2026). When derogation of other nations is coupled with glorification of one's own, this reflects nationalism (Federico et al., 2023), which can be particularly relevant for understanding how limited contact translates into negative stereotypes. It can "help" individuals navigate uncertainty by providing a clear distinction between a positively valued ingroup and less-valued outgroups (e.g., Zmigrod et al., 2018), while providing a framework through which individuals interpret limited experience with other nations. Sparse contact also provides fewer opportunities to encounter information that challenges idealized views of one's own nation or negative assumptions about others (e.g., Lin et al., 2022). Nationalism may thus mediate the association between intergroup contact and attitudes toward other nations: limited contact may facilitate nationalist beliefs, which can result in more negative representations of other nations.

People can, however, develop strong positive attachments to their own nation without viewing others as inferior. This form of national attachment – involving positive evaluations of one's own nation that are not contingent on derogating other groups – is referred to as patriotism (Huddy & Khatib, 2007). Whereas nationalism has been associated with lower intergroup trust, patriotism has opposite implications (Austers et al., 2024). Positive attachment to one's nation could therefore protect against biased representations of other nations under conditions of limited contact by providing an alternative basis for national identification.

Against this background, we examined whether nationalism helps explain the association between limited intergroup contact and negative stereotypes of other nations, while considering patriotism as a potentially protective factor. We examined Slovenians' attitudes toward nations of the former Yugoslavia and hypothesized that more limited contact would be associated with more negative stereotypes (H1) and stronger nationalist beliefs (H2). We further expected nationalism to at least partially mediate the association between limited contact and negative stereotypes (H3). Finally, we expected patriotism to buffer this association, such that the relationship between sparse contact and nationalism would be weaker among individuals higher in patriotism (H4).

Figure 1: Summary of moderated mediation models.



Methods

Participants and procedure

We collected a sample of 1,243 Slovenian residents aged 18–95 years ($M = 51.66$, $SD = 17.41$, 45% male). Data were collected in 2025, and all participants provided informed consent. The study was approved by the Ethics Committee of the Faculty of Arts, University of Ljubljana (No. 398-2024).

Measures

Stereotypes were assessed through ratings of applicability of 11 descriptors for 6 nations (Bosniaks, Croatians, Kosovars, Macedonians, Montenegrins, Serbs) on a 6-point scale (1 – *not applicable at all*, 6 – *completely applicable*). Descriptors were selected based on Udovič et al. (2017). Because their valence was not uniform, stereotype scores were derived using PCA, with the component rotated so that higher scores indicated more negative stereotypes.

Personal contact with members of each national group was rated on a 5-point scale (1 – *never*, 5 – *very frequently*). This item was reverse-coded, thus higher values indicate less contact.

Nationalism was assessed with the item "*I think that our nation is superior to other nations*," and **patriotism** with "*I am proud of my nation.*" Both items were rated on a 7-point scale. In the analyses, patriotism was calculated as the residual from regressing patriotism on nationalism, thus capturing the variance in patriotism not shared with nationalism.

Table 1: Path coefficients in moderated-mediation regression models.

Nation	a	b	c	a x b	Total
Croatians	0.08 ***	0.05	−0.09 *	0.00	−0.08 *
Bosniaks	0.12 ***	0.12 **	0.13 **	0.02 *	0.15 ***
Serbs	0.10 ***	0.11 **	0.10 *	0.01 *	0.11 **
North Macedonians	0.12 ***	0.10 *	−0.05	0.01 *	−0.04
Montenegrins	0.09 **	0.10 *	0.01	0.01	0.02
Kosovar Albanians	0.06 *	0.09 *	0.05	0.01	0.06

Note. a represents the regression path from personal contact to nationalism, *b* the path from nationalism to stereotypes, *c* the direct path from personal contact to stereotypes, and *a x b* the indirect effect of personal contact on stereotypes through nationalism.

Coloured ovals represent significant effects. HR – Croatians, BIH – Bosniaks – MK – Macedonians, ME – Montenegrins, RKS – Kosovar Albanians, RS – Serbs.

Results

We ran six separate moderated-mediation models examining stereotypes toward each of the six nations (Figure 1). Results consistently showed that less frequent contact with ex-Yugoslav nations was associated with higher nationalism across all models (Table 1).

This association, however, was moderated by patriotism only in the model concerning stereotypes toward Croatians. Contrary to our expectations, patriotism strengthened the association. Higher levels of nationalism were, in turn,

associated with more negative stereotypes toward all target nations except Croatians.

The direct effect of sparser personal contact on negative stereotypes was significant for Bosniaks and Serbs, with less frequent contact associated with more negative stereotyping. In contrast, less frequent contact with Croatians was associated with fewer negative stereotypes. The direct effect of contact was not significant for the remaining nations. Nationalism significantly mediated the association between personal contact and negative stereotypes toward Bosniaks, Macedonians, and Serbs. Thus, for these groups, the results provide evidence that the association between contact and stereotyping operates, at least in part, through nationalism.

Discussion

Sparser personal contact was consistently associated with higher nationalism, supporting H2. Greater exposure to and experience with other nations may therefore be associated with weaker nationalistic tendencies and more open-minded attitudes. Patriotism moderated this relationship only for Croatians, but contrary to H4, it strengthened the association between lower contact and higher nationalism. Croatia may represent a particularly salient comparison group for Slovenians due to the countries' historical proximity and continuing political and everyday interactions. Patriotism may thus also involve maintaining distinctiveness from a salient neighboring nation. This interpretation remains speculative and warrants further investigation. Contrary to H1, however, less personal contact did not consistently predict more negative stereotyping. One explanation is that our measure captured only contact frequency, not its quality, content, or context (Paluck et al., 2018). Frequent interaction may not reduce stereotypes when contact occurs in contexts that reinforce rather than challenge outgroup perceptions (Skrypnek & Snyder, 1982). Moreover, stereotypes are generalized and socially shared cognitive representations that may be more stable than affective evaluations such as prejudice, making them less responsive to individual interpersonal experiences.

Nationalism consistently predicted more negative stereotypes across most models, supporting H3 and suggesting that perceptions of national superiority are accompanied by downward comparisons with other national groups (Kende & Krekó, 2020).

The low proportion of explained variance warrants consideration when interpreting the findings. The examined relationships may represent only a small part of the broader set of individual and contextual factors contributing to the outcomes. Accordingly, the results present specific associations rather than a comprehensive explanation of the outcomes.

Overall, our findings suggest that the studied constructs are best understood as interconnected and embedded in specific sociocultural contexts (e.g., Fiske, 2017). Even considering these nations as relatively “close”, the relationships differed substantially, suggesting that a universal pattern cannot be assumed. Rather, the meaning and consequences of these constructs appear to depend on the historical and social context of each intergroup relationship.

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Ethno-Religious and Supranational Identity Configurations Among Youth in the Republic of Srpska: A Person-Centered Exploration

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Abstract

Person-centered methods have recently emerged in identity research to reveal qualitatively distinct configurations often obscured by traditional variable-centered analyses. Among Serb youth in the Republic of Srpska – a Serb-majority entity within Bosnia and Herzegovina (B&H) where Serbs constitute a demographic minority – strong ethno-religious identification seems to be normative, but acceptance of the (ex-)Yugoslav supranational identity and the state identity of B&H varies considerably. We derived a typology from high school and university students (n = 286), all of whom identified as ethnic Serbs. Five clusters emerged: *inclusive ethnonationalists* and *exclusive ethnonationalists,* both extremely high on ethno-religious identification but differing on Yugoslav and B&H identity; *pluralists*, who largely endorsed all identity categories; *ambivalents,* moderate on ethno-religious identity and low on the rest; and a *disengaged* cluster. Their profiles differed in religiosity, collective narcissism, traditionalism, attitudes toward science, authoritarianism, and epistemic style, with ambivalent and disengaged groups scoring lowest throughout. The two ethnonationalist profiles differed little on these variables despite their divergent Yugoslav identification, suggesting that acceptance or rejection of supranational identity may be largely independent of other dispositions.

Keywords: social identity; ethnonationalism; typology; youth; post-conflict society.

Introduction

More than three decades after the end of the civil war, Bosnia and Herzegovina (B&H) remains a country in which ethno-religious categories visibly influence social life. The Republic of Srpska (RS) is a Serb-majority autonomous entity within B&H, while Serbs constitute a demographic minority at the state level. Over recent decades, the demographic structure of RS has grown more homogeneous than it was before the war: Serbs made up 55.5% of the population on the territory now constituting RS in 1991 and 81.5% in 2013 (European Court of Human Rights, 2023, para. 20). Thus, most young Serbs in RS have grown up with limited everyday contact with the other two B&H constituent peoples (Bosniaks and Croats), unlike the generations that experienced multicultural Yugoslavia.

The ruling political discourse in RS continues to draw on ethno-religious tension and a narrative of threat from outgroups (Bertelsmann Stiftung, 2026), whereas cooperation is the practical reality both among political elites at the state level and in ordinary life. It is thus not clear whether exclusive ethno-religious identification is simply normative among Serb youth, or whether this landscape contains qualitatively complex configurations.

A person-centered approach can address the dilemma. Variable-centered analyses estimate associations across a sample assumed to be homogeneous; they can describe how ethno-religious and supranational identification correlate on average, but not that some respondents endorse both, others neither, and others maximize one while rejecting the other identity. Person-centered methods instead group individuals with similar response patterns and estimate how prevalent each pattern is in the target population. With that in mind, our study had two goals. First, we sought to derive an empirically based typology of ethnic, religious, national, and supranational identity configurations among Serb youth in RS. Second, we wanted to analyze the resulting profiles against ideological, cognitive, and well-being-related constructs.

Method

Participants

Data were collected through anonymous paper-and-pencil batteries administered in group settings in secondary schools and at the University of Banja Luka (RS, B&H). The final sample comprised 286 valid responses. Age ranged from 17 to 29 (M = 19.8, SD = 2.09), and the large majority of participants were female (78.0%). All participants self-identified as ethnically Serb and as citizens of B&H, and 97.9% as Orthodox Christian.

Measures

Identity importance was assessed with four single items sharing the stem "How important is it for you personally that you belong to this group/entity?" and referring, respectively, to one's ethnic group, one's religious group, the country of residence (Bosnia and Herzegovina), and ex-

Yugoslavia. Responses were given on five-point scales (1 = insignificant, 5 = extremely significant).

External variables spanned ideological, cognitive, and well-being domains (Table 1). All self-report measures used five-point scales, while general cognitive ability was measured with a 15-item short form of the ICAR Progressive Matrices (***ω*** = .90; Condon & Revelle, 2014).

Table 1: External measures with example items.

Measure (# of items and ***ω***)	Example item
Authoritarianism (6, .82)	Our society needs a strong and resolute leader so we can live safely.
Traditionalism (3, .76)	We should pay more attention to traditional values and question what is imposed on us from outside.
Collective narcissism (4, .88)	Overall, members of my nation are better people than members of other nations.
Ethnocentric dark tetrad (4, .74)	I would enjoy seeing particular other nations suffer (e.g., after a natural disaster).
Default epistemic style (3, .68)	Changing your mind about something important is a sign of weakness.
Ontological religiosity (3, .94)	I believe that God exists.
Risk-taking (3, .88)	Among my friends I am known as someone who tries potentially risky things first.
Science cynicism (2, -)	Overall, the development of scientific research and knowledge has brought humankind more harm than good.
Reconciliation impossible (1, -)	Genuine reconciliation between the peoples of this region will never come about, and it is better that we remain as separated as possible.
Selective pro-immigration (1, -)	I support allowing greater immigration of people from religions not present in our area (e.g., Nepalese, Indians, Chinese).
Political moderation (1, -)	Extreme left and extreme right ideologies are equally bad for a society.
Life satisfaction (1, -)	How satisfied are you with your life?
Sense of meaning (1, -)	I have a clear sense of meaning in my life.
Financial status (1, -)	How would you rate your family's financial situation?

Results

On average, religious (M = 3.92) and ethnic (M = 3.76) group membership were rated as considerably more important than membership in the B&H (M = 2.69) or in the former Yugoslavia (M = 2.36). Ethnic and religious identity were strongly correlated (r_s = .74), whereas their associations with the B&H (r_s = .32 for both) and with the supranational identity (r_s = .26 and .18) were noticeably lower; state and supranational identity correlated at r_s = .38.

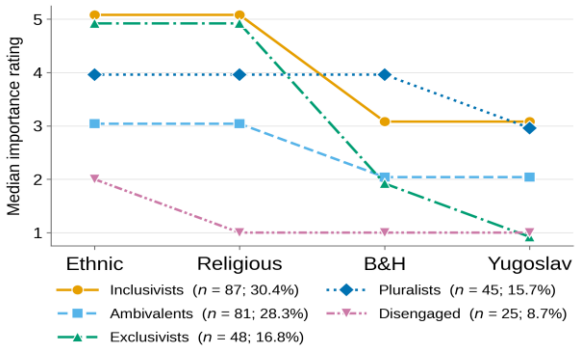
After model-based techniques (e.g. latent class and latent profile analysis) proved computationally unstable at this sample size, we derived identity profiles through a robust Partitioning Around Medoids (PAM) approach applied to a matrix of Gower distances (see Botyarov & Miller, 2022, for a non-technical description). Average silhouette width was highest for the two-cluster solution, which separated respondents by the overall intensity of their identifications rather than by configuration – reflecting the tendency of silhouette-based criteria to reward coarse, maximally separated splits. Among solutions that differentiated among complex configurations (from 3 to 9 clusters), average silhouette width peaked at five clusters.

Figure 1 displays the median profiles. *Inclusive ethnonationalists* (hereafter *Inclusivists*; n = 87, 30.4%) were characterized by maximal ethno-religious identification with moderate acceptance of both the state and the supranational identity. *Ambivalents* (n = 81, 28.3%) scored moderately on ethno-religious and low on the remaining dimensions. *Exclusive ethnonationalists* (hereafter *Exclusivists*; n = 48, 16.8%) matched the Inclusivists on ethno-religious identity but rejected the Yugoslav frame entirely. *Pluralists* (n = 45, 15.7%) endorsed all four identities, including the state, at a moderate-to-high level. Finally, the *Disengaged* cluster (n = 25, 8.7%) attributed little importance to any measured group membership.

Gender composition differed across profiles, $\chi^2(4) = 21.35$, $p < .001$, Cramér's $V = .28$. Males were nearly absent among Inclusivists (4.9%) and overrepresented among Exclusivists and Disengaged (33.3% in both).

On seven of the fifteen external variables the clusters differed with medium to large effects (Table 2). The ordering was largely consistent: Disengaged and Ambivalent clusters scored lowest, while Pluralists, Inclusivists, and Exclusivists occupied the upper range and were rarely distinguishable from one another. Of all pairwise contrasts between Exclusivists and Inclusivists – the two profiles that share maximal ethno-religious identification yet diverge most sharply on supranational identity (Mdn = 1 vs. 3) – only the Ethnocentric Dark Tetrad reached significance, with Exclusivists scoring somewhat higher (M = 1.77 vs. 1.49), $U = 1632.0$, $p = .033$, $d = 0.45$.

Figure 1: *Identity importance ratings across the five profiles.*



Discussion

Our findings suggest that identity configurations among Serb youth in RS do not amount to an exclusive ethno-religious monolith. Exclusivists – the profile closest to the exclusionary narrative – were among the smaller groups, while the largest cluster combined maximal ethno-religious identification with moderate acceptance of both the state and the supranational frame. However, the associations with external variables were related to the intensity of ethno-religious identification rather than the acceptance of the complex identity configuration (see Pratto et al., 2017, for a deeper treatment of complex identities among youth in the Western Balkans). For instance, although exclusive and inclusive ethnonationalists diverged on the Yugoslav dimension, they were almost indistinguishable on measured external dispositions.

Table 2: Comparisons across identity profiles.

Variable	$H(4)$	p	ε^2_R	Ordering
Ontological religiosity	72.77	<.001	.26	Dis < Amb < Plur < Incl ≈ Excl
Collective narcissism	50.93	<.001	.18	Dis ≈ Amb < Incl ≈ Plur ≈ Excl
Traditionalism	41.86	<.001	.15	Dis < Amb < Plur ≈ Excl ≈ Incl
Science cynicism	37.45	<.001	.13	Amb ≈ Dis < Plur ≈ Excl ≈ Incl
Authoritarianism	33.10	<.001	.12	Dis ≈ Amb < Excl ≈ Plur ≈ Incl
Ethnocentric dark tetrad	30.47	<.001	.11	Dis ≈ Amb < Incl ≈ Plur ≈ Excl
Default epistemic style	24.65	<.001	.09	Dis ≈ Amb < Excl ≈ Plur ≈ Incl
Life satisfaction	16.72	.002	.06	—
Sense of meaning	12.83	.012	.05	—
Reconciliation impossible	12.42	.014	.04	—
Cognitive ability	9.54	.049	.03	—
Selective pro-immigration	9.52	.049	.03	—
Political moderation	7.58	.108	.03	—
Financial status	7.45	.114	.03	—
Risk-taking	3.72	.446	.01	—

Note. ε^2_R = standardized effect size (Fiel Peres, 2026). Orderings are based on uncorrected pairwise Mann–Whitney comparisons. Dis = Disengaged, Amb = Ambivalents, Plur = Pluralists, Incl = Inclusivists, Excl = Exclusivists.

Several limitations of our study need to be emphasized. The convenience sample of predominantly female students does not warrant population prevalence estimates, and this is a particular concern given how strongly gender related to profile membership. Furthermore, cluster solutions are sample-dependent; alternative partitions may emerge in different populations. For instance, the supranational dimension would plausibly organize the typology quite differently among older cohorts who actually lived in Yugoslavia where a distinct supranational-only pattern could emerge. That said, we believe the profiles we identified offer a blueprint for prevalence estimation in post-conflict settings, and we would welcome its extension to the other constituent peoples of B&H and ex-Yugoslavia region.

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What Shapes Physical Appearance Satisfaction? The Effects of Body Shape, Body Image, and Self-Objectification

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Abstract

Physical appearance satisfaction is an important component of body image, shaped not only by objective physical characteristics but also by psychological and sociocultural factors. Drawing on Self-Discrepancy Theory and Objectification Theory, the aim of this study was to examine the extent to which body composition, the discrepancy between current and ideal body image, and self-objectification contribute to satisfaction with physical appearance. The sample comprised 360 participants (52.7% women) aged 18-70 years (M = 34.44). Participants reported their body measurements, selected their current and ideal body image on a silhouette scale, completed an objectified body consciousness measure, and rated their appearance satisfaction. The findings indicate that the discrepancy between current and ideal body image is the strongest predictor of appearance (dis)satisfaction. Internalization of cultural beauty standards and body surveillance also negatively contributed to satisfaction, whereas body composition indicators ceased to be relevant once self-objectification was taken into account. The results suggest that psychological and sociocultural mechanisms outweigh objective bodily characteristics, which has implications for body image interventions.

Keywords: body image; physical appearance satisfaction; ideal-actual body discrepancy; self-objectification; sociocultural pressures

Introduction

Physical appearance satisfaction represents the evaluative dimension of body image and reflects the degree to which individuals accept and positively evaluate their own physical appearance (Cash & Pruzinsky, 2002). Although one might expect this evaluation to be determined primarily by objective bodily characteristics, research shows that subjective and sociocultural factors contribute substantially to how individuals evaluate their appearance, over and above objective body size (Paterna et al., 2021).

Self-Discrepancy Theory (Higgins, 1987) provides a framework for understanding the affective consequences of incongruence between different self-representations. According to this theory, a gap between the actual self (one's perception of one's own attributes) and the ideal self (a representation of what one would like to be) is associated with dejection-related emotions such as disappointment, sadness, and dissatisfaction. Applied to body image, greater actual–ideal self-discrepancies are associated with higher levels of body shape dissatisfaction, independent of actual body mass (Strauman et al., 1991).

Objectification Theory (Fredrickson & Roberts, 1997) complements this account by adding a sociocultural perspective. It proposes that exposure to a culture that treats the body as an object to be looked at leads individuals to internalize an observer's perspective toward their own body (self-objectification). This internalized perspective manifests as ongoing body monitoring, which is closely aligned with the body surveillance described (McKinley & Hyde, 1996). Consistent with this framework, recent evidence shows that body surveillance and internalization of appearance ideals are associated with lower body satisfaction (Frederick et al., 2022; Paterna et al., 2021), and a recent meta-analysis confirmed a robust positive relation between self-objectification and body dissatisfaction across samples (Saunders et al., 2024).

The aim of this study was to examine the extent to which body composition indicators, body image discrepancy, and self-objectification predict physical appearance satisfaction. Although these predictors have been studied separately (Frederick et al., 2022; Lombardo et al., 2022; Paterna et al., 2021; Saunders et al., 2024), they are less often examined within a single model that allows their relative and unique contributions to be estimated. Based on the mentioned theoretical backgrounds and previous research (Frederick et al., 2022; Paterna et al., 2021; Saunders et al., 2024), we expected that body image discrepancy and self-objectification (body surveillance and internalization of cultural beauty standards) would negatively predict physical appearance satisfaction, and that these psychological and sociocultural factors would account for satisfaction over and above objective body composition indicators.

Method

Participants and Procedure

The sample comprised 360 participants (52.7% women), aged 18-70 (M = 34.44, SD = 19.88), of whom 32% were students and the rest were adults from the general population.

Measures

Body composition. Participants reported their height and weight, from which body mass index (BMI) was calculated (kg/m²). They also reported their waist and hip circumferences (in cm).

Body image discrepancy. Body image was assessed using a 10-figure silhouette scale, separate for women and men; therefore, women and men rated different set of figures. Participants selected the silhouette corresponding to their current appearance and the one corresponding to their ideal appearance. The body image discrepancy score was computed as the difference between the current and the ideal selection.

Self-objectification. Self-objectification was assessed using the Serbian adaptation of the Objectified Body Consciousness Scale (McKinley & Hyde, 1996; Serbian adaptation: Velov & Zotović, 2020), which comprises three components: internalization of cultural beauty standards, body surveillance, and control beliefs. In the present analyses, only the internalization (8 items, α = .77) and body surveillance (8 items, α = .84) subscales were used in line with Objectification Theory.

Physical appearance satisfaction. Satisfaction was measured with a single item, on a scale ranging from 1 (*not at all satisfied*) to 7 (*completely satisfied*).

Results

A hierarchical regression analysis was conducted in three steps, with physical appearance satisfaction as the criterion (Table 1).

In the first step, BMI, waist circumference, and hip circumference were entered as body composition indicators in the analyses. This block explained 12.1% of the criterion variance [$F(3, 356) = 16.41$, $p < .001$], with BMI being the only significant and negative predictor. In the second step, body image discrepancy was added, which significantly improved the model [$F(1, 355) = 70.76$, $p < .001$] and explained additional 14.6% variance. In this step, body image discrepancy was the strongest (negative) predictor, while body composition indicators were no longer significant. In the third step, internalization of cultural beauty standards and body surveillance were entered, which further improved the model [$F(2, 353) = 18.82$, $p < .001$] adding 7.1% of variance. Both internalization and body surveillance negatively predicted satisfaction, while body image discrepancy remained significant and the strongest predictor (Table 1). The final model explained 33.8% of the criterion variance.

In addition, we initially included gender as a control variable in the first step of the analysis. However, as gender was not a significant predictor in any of the models, we omitted it from the analysis.

Table 1: Standardized coefficients of the final model predicting physical appearance satisfaction.

Predictor	β	*p*
BMI	−.06	.342
Waist circumference	−.02	.706
Hip circumference	.00	.958
Body image discrepancy	−.43	< .001
Internalization	−.13	.014
Body surveillance	−.18	.001

Note. N = 360. β = standardized regression coefficient in the final model. $\Delta R^2 = .121$ (Step 1), .146 (Step 2), .071 (Step 3); $R^2 = .338$ for the final model. All *p*s for $\Delta R^2 < .001$.

Discussion and Conclusions

The findings showed that psychological (body image discrepancy) and sociocultural factors (self-objectification) play a more prominent role in explanation of physical appearance satisfaction than objective bodily characteristics. The body image discrepancy emerged as the strongest predictor of satisfaction, consistent with Self-Discrepancy Theory (Higgins, 1987) and with evidence that actual–ideal discrepancies predict body dissatisfaction independently of body mass (Strauman et al., 1991). The greater the perceived gap between how individuals see themselves and how they would like to look, the lower is the satisfaction. In line with Objectification Theory (Fredrickson & Roberts, 1997), body surveillance and internalization of cultural beauty standards also contributed to lower satisfaction, likely by reinforcing unrealistic appearance ideals and promoting chronic self-monitoring, presumably through the mediating role of body surveillance identified in integrated sociocultural models (Frederick et al., 2022). This is also in line with meta-analytic evidence linking internalization of appearance ideals to greater body dissatisfaction (Paterna et al., 2021).

A particularly informative finding is that body composition indicators lost significance once self-objectification was included. This pattern might indicate that the effect of body composition is largely indirect, operating through internalized standards and evaluative processes rather than exerting a direct influence.

These findings should be interpreted in light of several limitations. Appearance satisfaction was assessed with a single item, and body measures were based on self-report, both of which may reduce precision. The convenience sample, though spanning a wide age range, limits generalizability. Future research could employ multi-item measures, objectively measured (rather than self-reported) body composition, and direct examination of sex differences, given that Objectification Theory was originally formulated in the context of women's experience.

The practical implication of these findings is that interventions aimed at improving body image should target cognitive–perceptual and sociocultural mechanisms, such as reducing the internalization of unrealistic beauty ideals through media literacy and decreasing chronic body surveillance, rather than focusing solely on physical characteristics.

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Fifty-fifty? Or not?: Patriarchal Values and Household Labor as Predictors of Women's Mental Health

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Abstract

Women's participation in the labour market has not eliminated inequalities in housework, which may affect their well-being. This study examined how patriarchal values relate to housework, parenting, and women's mental health. The sample consisted of 890 participants from the general population, including 128 couples. Women reported greater involvement in housework than their male partners and spent more time on housework and childcare. They also reported more gender-egalitarian and less traditional attitudes. Financial status and non-traditional gender-role attitudes predicted depression. Anxiety was predicted by age, financial status, egalitarian success attitudes, non-traditional gender roles attitudes, and housework hours, while stress was associated with age, financial status, and housework hours. Couple-level analyses showed that greater differences in partner's gender-role attitudes were associated with greater perceived differences in housework sharing. Perceived differences in parenting and housework involvement were also associated with women's stress. The findings highlight persistent gender inequalities in unpaid work and their relevance to women's mental health.

Keywords: Patriarchal Values, Housework, Depression, Anxiety, Stress

Introduction

Women's participation in the labour market has not reduced inequalities in housework, which can be understood in the context of patriarchal values. Patriarchal ideology (Millett, 1977) overemphasises biological differences between men and women, traditionally assigning women greater responsibility for housework, childcare, and other unpaid work. Paid employment is associated with better mental health (Schuring et al., 2017), while women working outside the home report better physical and mental health than those working solely in the household (Fokkema, 2002; Khlat et al., 2000). Women's lower well-being may partly reflect greater involvement in housework and less involvement in paid work (Boye, 2009). In a patriarchal system, paid work may reduce women's economic dependence and increase access to resources and social power. Employment may also enhance their sense of control (Rosenfield, 1989). In Serbia, women perform most household and unpaid work, while men retain traditional gender roles (Dragišić Labaš, 2021). Despite women's broad participation in paid work, they more often leave employment for family and household responsibilities (Stanojević, 2018). While previous research has focused on the relationship between employment status and mental health, the role of patriarchal values in household division and mental health remains understudied. This study examines how patriarchal values relate to household labour, parenting involvement, and women's mental health.

Method

Participants

The sample consisted of 890 participants from the general population (78% women, Mdn^{age} = 32), including 128 couples. Individual-level analyses used the total sample, while couple-level analyses used the 128 couples, identified by a shared code linking partners' responses. Matched reports were used to calculate couple-level difference scores for housework, parenting involvement, and gender-role attitudes.

Instruments

We used the Attitudes Towards Gender Roles scale (ATGRS) (Delgado-Herrera et al., 2024), consisting of 31 items and four factors, to assess patriarchal attitudes (Traditional attitudes towards gender roles, α = .86; Favorable attitude towards egalitarian success, α = .83; Favorable attitude towards gender equity, α = .78; Non-traditional attitudes towards gender roles, α = .82) and DASS-21 (Lovibond & Lovibond, 1995) translated into Serbian, consisting of 21 items and three subscales: depression (α = .88), anxiety (α = .85) and stress (α = .87) in women. Housework and parenting involvement were assessed using absolute measures (self-report weekly hours) and relative measures (perceived partner involvement assessed using a slider).

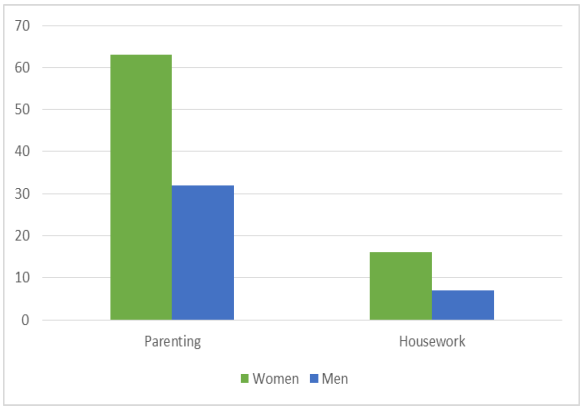
Procedure

Participants completed an online questionnaire requiring responses to all items before proceeding. Demographic data were collected first, followed by questions on partner's involvement in housework and/or parenting. These questions were not shown to participants without partners or children. Female participants then completed the DASS-21, while all participants completed the ATGRS. The DASS used four-point Likert scale (from "Did not apply to me at all" to "Applied to me very much"), while the ATGRS used a five-point Likert scale (from "Strongly disagree" to "Strongly agree"). Couple-level difference scores for gender-role attitudes were calculated by subtracting man's scores from women's scores. Positive values indicated higher scores for women, whereas negative value indicated higher scores for men. Financial status was assessed on a five-point scale, from financial hardship to high financial comfort.

Results

Women reported greater involvement in housework was than their male partners' (Mdiff = -.74, t (127) = -2.233, p = .03), but not their parenting involvement (Mdiff = -87, t (127) = -1.92, p = .057). Women spent more hours on housework (U = 32, 915.50, z= −10.93, p < .001) and were more involved in childcare (U = 17, 202.50, z = −8.53, p < .001) compared to men (see Figure 1). We found that women had less traditional attitudes (t (127) = 6.60, p < .001, M = 0.52) and more positive attitudes toward gender equality than men (t (127) = 7.20, p < .001, M = 0.31). Three hierarchical regression analyses examined predictors of depression, anxiety, and stress. For depression, sociodemographic variables explained 7% of the variance, R^2= .070, F (3, 522) = 13.20, p < .001. Gender-role attitudes did not significantly improve the model, Δ R^2 = .012, Δ F (4,518) = 1.76, p = .136, whereas adding housework and parenting significantly increased explained variance, Δ R^2 = .011, Δ F (2, 516) = 3.12, p = .045. The final model explained 9.4% of the variance, R^2= .094, F (9, 516) = 5.94, p < .001; financial status (β = -.260, p < .001) and non-traditional gender role attitudes (β = .094, p = .042) were significant predictors. For anxiety, sociodemographic variables explained 4.8% of the variance, R^2= .048, F (3, 522) = 8.74, p < .001. Both gender-role attitudes Δ R^2 = .025, Δ F (4, 518) = 3.42, p = .009, and housework and parenting, Δ R^2 = .012, Δ F (2, 516) = 3.31, p = .037, significantly improved the model. The final model explained 8.4% of the variance, R^2= .084, F (9, 516) = 5.27, p < .001; significant predictors were age (β = -.114, p = .017), financial status (β = -.194, p < .001), favourable attitudes toward egalitarian success (β = .105, p = .033), non-traditional gender-role attitudes (β = .094, p = .043), and housework hours (β = .113, p = .011). Regarding stress, sociodemographic variables explained 6.1% of the variance, R^2= .061, F (3, 522) = 11.32, p < .001. Gender role attitudes did not significantly improve the model, Δ R^2 = .008, Δ F (4, 518) = 1.15, p = .333, whereas housework and parenting did, Δ R^2 = .017, Δ F (2, 516) = 4.89, p = .008. The final model explained 8.7% of the variance, R^2= .087, F (9, 516) = 5.44, p < .001; age (β = -.141, p = .003), financial status (β = -.208, p < .001), and housework hours (β = .093, p = .034) were significant predictors. Couple-level analysis showed that greater differences in partners gender-role attitudes were associated with greater perceived differences in household task sharing, R^2 = .040, F (1, 126) = 5.26, p = .023. Both perceived differences in parenting (r = .19, p < .05) and household involvement (r =.26, p < .01) were related to reported stress in women.

Figure 1: Mean Weekly Hours Spent on Parenting and Housework by Gender.



Discussion and Conclusions

Hierarchical regression analysis showed that the examined variables partly predicted women's mental health, with financial status as the most consistent predictor. This is consistent with previous research linking women's lower well-being to poorer economic status and greater unpaid household work (Boye, 2009). Anxiety and stress were also associated with more hours of housework, further supporting unpaid work as an important source of psychological distress (Boye, 2009). Unexpectedly, non-traditional attitudes were statistically significant predictors of depression and anxiety, while positive attitudes towards egalitarian success predicted anxiety. These findings may reflect a conflict between values and the actual division of household work (Greenstein, 1996). Couple analysis showed that the more egalitarian women's attitudes were than their partners, the greater the perceived difference in housework sharing. Perceived differences in partners' involvement in housework and parenting were significantly associated with women's stress. These findings suggest that perceived unequal partner involvement in housework and parenting may be an important source of stress. The findings may indicate psychometric limitations of the ATGRS, requiring further evaluation in the Serbian population. Overall, women's mental health is linked to the interplay of gender-role attitudes, household and parenting responsibilities, and socioeconomic status. The association of unequal involvement in housework and parenting with stress highlights the importance of equal unpaid work distribution for women's well-being.

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Factorial Validity of the Three-Dimensional Political Orientation Questionnaire in the Serbian Context

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Abstract

There are various perspectives on the nature of dimensions underlying political orientation (PO). Previous research has questioned the suitability of the left–right continuum of PO among youth. In Serbia, majority of the youth is struggling when asked to position themselves on the left-right spectrum. One of the alternatives to this approach is a questionnaire-based assessment. There has been a development of such questionnaire in Slovenia, based on a three-dimensional model of PO, encompassing social (nature, lifestyle, social justice), economic (state- vs. market-controlled economy), and international (migrations, security, national identity) dimensions. Factorial validity of this three-dimensional model was tested in our study. We expected to replicate a three-factor structure with moderately correlated factors and to examine its relationships with the self-placement model of social and economic, expecting moderate correlations between the corresponding dimensions. A total of 207 high school students, aged 15-18 participated in the study. A confirmatory factor analysis showed inadequate fit of the three-factor model. After modifications, the model showed adequate fit. Overall, results suggest that the three-dimensional Political orientation questionnaire is generally adequate for young population, but that it needs to be contextually adapted.

Keywords: political orientation; three-dimensional political orientation scale; youth; Serbia; CFA

Introduction

The perennial question of the dimensionality of political orientation (PO) within individuals has received widespread attention from social scientists over the decades. It is unlikely that the literature will converge on a singular dimensional structure of PO, though a historically dominant understanding of the organisation of political ideology exists. The left-right continuum has thence reigned as the dominant method for assessing PO in social studies up until recently (Jost et al., 2009). Notably, even though several researchers have pointed to the questionable epistemic quality of the left-right continuum, there remains a volume of empirical work which suggests that the singular dimension left-right is robust and, in a sense, 'good enough' for researching political behaviours such as voting (Jost et al., 2009). However, the perceptions, either of citizens or political elites, of the left-right continuum is inextricably contingent upon the historical and social context of particular countries. That is to say that, for instance, historical perseverance of specific social issues may polarize the voting body of some countries significantly more than others, or that inherited historical configurations of government may differentially contextualize the content of either left or right ideologies (Lep & Kirbiš, 2022). Another threat to the internal validity of the left-right continuum, especially in terms of assessment of PO of younger populations, is that it encompasses a wide range of different social attitudes, ideologies and expectations - which make it susceptible to a vast array of individual interpretations (Huber & Inglehart, 1995). Having that in mind, assessment of PO should therefore be contextually sensitive, as well as more nuanced. Lep & Kirbiš (2022) tested a multidimensional model of PO on Slovenian youth, finding good model fit, stable internal consistencies of factors and good external validity as the three dimensions of the model correlated with Schwarz's ten universal values more than the traditional left-right divide. The model distinguishes three dimensions of PO: social, economic, and international. The social factor is related to attitudes towards different lifestyles, preservation of the natural surroundings and human rights. The economic factor is concerned with matters relating to the role of the state in the economy. The

international dimension captures attitudes towards European integration and related issues, such as immigration policies and national identity (Lep & Kirbiš, 2022). Examining the applicability of this model among Serbian youth is particularly relevant given that 57.7% of young people in Serbia cannot place themselves along the left–right continuum (Popadić et al., 2019), highlighting the need for more nuanced approaches to assessing PO. Therefore, the main goal of the present study was to examine the validity of the proposed three-factor model of PO among Serbian youth.

Method

In this study we tested the factorial validity of the three-dimensional model of PO in the Serbian context. We expected to replicate a three-factor structure with moderately correlated factors and to examine its relationships with the self-placement model of social and economic, expecting moderate correlations between the corresponding dimensions. With this aim we translated the questionnaire from English using the double-blind translation method. In addition to the three-dimensional PO questionnaire, we also measured PO using self-placement on the left-right continuum in terms of values and economic issues. A total of 207 high school students (53% women), aged 15-18 (M=16.4, SD=0.89) participated in the study. The three-dimensional model of PO was tested using confirmatory factor analysis (CFA).

Results

The CFA was conducted using robust maximum likelihood estimation. The CFA showed inadequate fit of the three-factor model ($\chi^2(32) = 99.75$, $p < .001$, CFIr = .881, TLIr = .833, RMSEA = .10, 90% CI [.08, .12]). Modification indices suggested allowing residual covariances between two items loading on the social factor, as well as between one item from the social and one item from the international factor. Since the correlations between international and both social and economic dimensions were not statistically significant (rs = .03, .01; ps = .82, .96, respectively), we fixed them at zero in the modified model. Following these modifications, the model showed an adequate fit ($\chi^2(32) = 62.66$, $p < .001$, CFIr = .960, TLIr = .944, RMSEA = .07, 90% CI [.04, .09]). The reliability of the social ($\alpha = .70$) and international dimensions ($\alpha = .74$) was acceptable, whereas the economic dimension showed unsatisfactory reliability ($\alpha = .34$). Standardized factor loadings ranged from .50 to .80 for the social and from .65 to .75 for the international dimension. For the economic dimension, two items had loadings of .52 and .64, whereas the third item showed a negligible factor loading of .05. The correlation between the social and economic dimensions was statistically significant ($r = .76$, $p = .02$). All dimensions, social, economic and international, showed low to moderate correlations with social (rs = –.45, –.16, .38, respectively; ps < .001) and economic self-placement PO (rs = –.40, –.40, .26, respectively; ps = .025). These correlations were calculated using composite mean scores for each dimension.

Discussion and conclusions

The results of our study generally support the proposed three-dimensional structure, although the questionnaire requires contextual adaptation. The deviation from the expected pattern of correlations between the international dimension and the other two dimensions may be partly related to the characteristics of the sample. Our participants were high school students, and adolescence represents a formative period during which political attitudes continue to develop, becoming increasingly stable, complex, and nuanced (Rekker et al., 2015). In contrast, the original study included participants aged 14 to 29 years, which may have contributed to the different pattern of associations between the dimensions (Lep & Kirbiš, 2022). Furthermore, Serbia's geopolitical context, including issues surrounding EU integration, its near-encirclement by NATO states and its balancing between global centres of power, as well as the unresolved dispute over Kosovo's independence and narratives of victimhood and historical injustice against the Serbs present in public discourse, may contribute to attitudes towards national identity, security and illegal immigration not being associated with social and economic ideological orientations in the theoretically expected manner. The low reliability of the economic dimension was related to the very low loading of the item *"Government ownership of business and industry should be increased"* on this dimension. In a context of pronounced distrust in the social system among young people in Serbia (Mandić & Vinokić, 2025), responses to this item may reflect attitudes toward the current political elite or the existing socio-economic system rather than a broader economic left-wing orientation. Therefore, we suggest adapting this item to emphasize private rather than government ownership. The residual correlation between the items *"Preservation of natural environment"* from the social and *"Fostering national identity"* from the international dimension may partly reflect specific features of the Serbian political context, in which pro-environmental attitudes can coexist with nationally oriented political narratives. The pattern of correlations between the dimensions of the political orientation scale and self-placement was generally expected. However, the social dimension correlated similarly with both social and economic self-placement. This theoretically unexpected association may reflect the relatively late development and stabilization of economic attitudes, particularly during late adolescence and early adulthood (Rekker et al., 2015).

Overall, the results suggest that the three-dimensional Political orientation questionnaire is generally suitable for young populations, although further contextual adaptation is needed. Future studies should test the model in adult samples and further examine its construct and criterion validity. Cross-cultural adaptations should also be explored, particularly in societies with complex political contexts.

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In Joy and Sorrow – Relationship Dynamics from the Perspective of Women Going Through IVF

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Abstract

Infertility treatment affects couples' dynamics and identities by putting their life on hold and focusing their attention on family planning. The aim of this study was to explore the quality of relationship dynamics in couples going through IVF, from the women's perspective, who are disproportionally affected by societal expectations and treatment. Participants were 20 women in long-term relationships, trying for their first child through IVF in Serbia. Method was qualitative, data were gathered through semi-structured interviews and analyzed through interpretative phenomenological analysis. Five themes were identified: intimacy; life as usual for men; discipline; emotional availability and the absolution. Sexual life tasked with the burden of conceiving stripes couples of the actual intimacy. Women share resentment towards the dynamics that spares their partners of the investment and their lives continuing as usual. If women are put on bed-rest, male partners discipline women's bodies and activities, which is on occasion considered burdensome. Women may perceive their partners as being emotionally unavailable, limiting proper partner communication. Finally, male partners have a role in absolving women of guilt and opening up to alternatives in family planning. These findings point out to the gendered nature of infertility treatment and cultural norms of biological parenthood.

Keywords: infertility; IVF; relationship dynamics; experience;

Introduction

Achieving pregnancy and starting a family is often considered a normative developmental step in the relationship of long-term heterosexual couples (Cunningham & Cunningham, 2013). When it doesn't happen, couples may question their identity as partners or their respective gender identities. Infertility is diagnosed when pregnancy is not achieved after 12 months of unprotected intercourse (WHO, 2025). This pause in their life course qualifies as a crisis and puts unexpected demands on both partners. Being unable to start a family without medical help affects the partnership dynamics and their views of the future (Throsby, 2004). One of the first demands is to reach out to a medical service and get referred to an infertility specialist.

IVF is an infertility treatment option, which was, until 2025, mostly available to heterosexual couples in Serbia (Health Insurance Fond Serbia, 2023). Insurance in Serbia covers unlimited number of IVFs for women under 45, if they fulfil other health conditions.

The toll infertility treatment takes, including IVF is particularly complex for women. Not only are the societal expectations about parenthood stricter for women (Todorova & Kotzeva, 2003), but the treatment is done on a woman's body. This disproportion of the investment of men and women creates a unique challenge for their dynamics. Even though both partners are delaying life plans and questioning identities, women are faced with hormonal and other therapies, check-ups, injections, pain and interventions. Additionally, infertility treatment shifts the couples' focus almost exclusively to family planning, leading to a programmed and goal-oriented sexual relationship, stripped from connection and intimacy (Mitrović et al., 2023). Finally, treatment is not necessarily successful, leaving couples faced with loss of time, finances and health, and repeatedly faced with the idea that they are not becoming parents (Franklin, 2002).

Research aim presented here was to explore the quality of the relationship dynamics in couples undergoing IVF, from the perspective of women. Findings are a part of a larger study exploring women's IVF experiences, due to the disproportion in societal expectation and the toll treatment has on women's lives.

Method

The Sample consisted of 20 women in long-term heterosexual partnerships, aged between 29 and 42, who underwent between one and five IVFs in various Serbian hospitals, trying for the first child. Participants were recruited online, through a social media call.

Method was qualitative. Women's personal perspectives were prioritized (Ashworth, 2008) and interpreted within their socio-cultural context (Marecek, 2003).

Data collection technique were semi-structured interviews allowing women to freely share their experiences, and the researcher to ask additional questions and explore unique themes (Smith & Osborn, 2008).

Depending on the trajectory of the treatment (whether it continued after the first interview), between one and four interviews were conducted with each participant. Conducting more than one interview allowed the researcher to keep up with the partnership dynamics throughout the experience, until the end of the treatment (i.e. miscarriage, pregnancy). There were total of 45 interviews in the analysis.

Findings

Data were analyzed with the use of interpretative phenomenological analysis (Larkin et al., 2006). Interviews were transcribed verbatim. Codes ("patterns of meaning") were identified within each transcript and then generated across transcripts using a qualitative analysis tool MAXQDA. Themes shared across transcripts were identified and interpreted within the wider socio-cultural

context of participants (partnerships, societal expectations, gender roles…).

Five main themes were identified: intimacy; life as usual for men; discipline; emotional availability; absolution.

Intimacy

At the beginning of treatment, couples are advised to have scheduled intercourse in order to assure insemination at the right moment of a woman's cycle. Tasking couples with having sex at a specific time, with the burden of conceiving, takes a toll on their relationship, leaving women feeling like their sexual life is programmed and stripped of actual intimacy.

Having a baby, previously expected to be a spontaneous and somewhat romantic part of life, turns into a task involving doctors and meticulous planning.

It becomes a part of the routine and nothing is spontaneous anymore. You have an opportunity now and if you waste it, you have to wait for the next month. Romance is lost and something that should be nice becomes a burden. (Marijana, 31, first IVF)

Life as usual for men

Unlike women's lives, affected by infertility treatment since they are the ones receiving therapies, injections, going to appointments and suffering through medical interventions, the lives of men remain largely unchanged. Women perceive their partner's lives as continuing as usual. Even though they recognize that men rarely get absence from work in case of IVF, participants shared some resentment towards the dynamics which puts them at the frontline of the treatment and spare their partners of physical, logistical and psychological investment.

Going through infertility treatment becomes a gendered experience, much like parenthood itself (Ivković et al., 2014).

His life pretty much kept going, it is really different. (Azra, 38, one failed cycle)

Discipline

Going through treatment sometimes means being put on bed-rest, in fear of complications or with the aim of raising the chance for conceiving. If that happens, male partners actively discipline women's bodies, limiting their movement and keeping them away from housework. This engagement of male partners is welcomed, although it can be considered burdensome if it strips women of their agency.

I think he annoyed me with "Don't do this, don't do that". It started to bug me, I'm not disabled. I know what I can do and what I shouldn't be doing. (Kristina, 36, third IVF)

At the same time, disciplined bodies don't necessarily lead to successful delegation of housework to male partners. Housework is either being postponed or delegated to other women in the family, highlighting the gendered nature of the entire experience.

Emotional availability

Since the majority of the treatment happens on a woman's body and loss is first noticed by them (bleeding, pain), male partners have an important role in providing emotional support. Some women were grateful for the care and attention received from their partners. However, sometimes they fall short, especially when faced with repeated loss or prolonged treatment.

When they perceive their partners as emotionally unavailable, participants were likely to observe their behavior and seek support in the interpretation, rather than openly communicating.

My husband, he rarely, he struggles with expressing his emotions. He shows you more than he can tell you with his words. (Irena, 37, fifth IVF)

Absolution

Male partners are perceived to have an important role in absolving women of responsibility and guilt when it comes to infertility, as well as opening up towards alternatives in family planning.

He said that, even though I can't have children, we can adopt. And honestly, I am seeing the entire IVF differently since then. I know now that the last option can be adoption. (Iva, 32, third IVF)

This speaks length about the role women assign to their partners, in resisting the cultural norm of biological parenthood and relieving them of the societal pressure to conceive biologically.

Conclusion

These findings are based on women who are childless, creating somewhat of a bias towards negative experiences of IVF. However, demands of infertility treatment are certainly affecting relationship dynamics and these findings can be used to further explore gender roles in infertility treatment, cultural norms of biological parenthood and finally, the need for a psychological support for couples trying for a child through IVF.

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Life Satisfaction, Well-Being, Spirituality, and Religiosity Among Adolescents in the Republic of Srpska

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Abstract

Adolescent mental health is increasingly understood as the presence of well-being, not merely the absence of illness. Drawing on research on subjective well-being and on models of protective and enriching developmental experiences, this study examined whether religiosity and spirituality contribute to adolescents' global life satisfaction beyond their day-to-day well-being. High school students from the Republic of Srpska (Bosnia and Herzegovina) completed measures of life satisfaction, day-to-day well-being, spirituality, and centrality of religiosity. Boys reported higher life satisfaction and well-being, whereas girls reported higher spirituality and religiosity. When considered together, well-being dominated the prediction of life satisfaction, religiosity made a small additional contribution, and spirituality showed no unique association. Boys' advantage in life satisfaction was no longer evident once well-being was taken into account. Overall, religiosity appears to play a modest supportive role in adolescent life satisfaction. The absence of an independent spirituality effect contrasts with recent Slovak evidence but aligns with meta-analytic findings favoring conventional religious involvement, suggesting that relationships of religiosity and spirituality with adolescent life satisfaction are context-specific.

Keywords: life satisfaction; well-being; spirituality; religiosity; adolescence

Introduction

During adolescence, rapid biological, cognitive, and social changes bring more abstract, integrated self-understanding (Crone et al., 2022), and adolescents reliably form meaningful judgments of their lives as a whole (Proctor et al., 2009). Researchers ask what helps young people do well, increasingly treating mental health as the presence of well-being, not merely the absence of illness (Keyes, 2002; Seligman, 2011).

Subjective well-being research treats life satisfaction and well-being as parts of a broader whole: life satisfaction is its cognitive component, a global evaluation of one's life against self-chosen standards (Diener et al., 1999), and well-being, in the narrower, experiential sense, is how a person has recently felt and functioned in daily life (Huppert, 2009). The components are related but separable and not interchangeable at the individual level (Grimes et al., 2026; Lucas et al., 1996). They also have partly different antecedents, with resources tied more closely to life evaluations than to everyday feelings (Fors Connolly & Gärling, 2024). Life satisfaction is more integrative, as people evaluating their lives draw partly on how they have recently felt (Kuppens et al., 2008). Day-to-day well-being is therefore better understood as an input to life evaluations than as their result. It is far less clear how much resources that give young people meaning and belonging add to their life evaluations beyond how they feel day to day.

Among the resources that could play this part, religiosity and spirituality have a strong claim. Both fit the model of protective and compensatory experiences (PACEs; Hays-Grudo & Morris, 2020), supportive relationships and enriching resources that foster resilience and healthy development, because they give adolescents connection, belonging, and a narrative for meaning. Religiosity refers to institutional beliefs, formal practices, and identification with an organized tradition, whereas spirituality refers to a personal search for the sacred and for meaning that may occur outside formal religion (Zinnbauer & Pargament, 2005). Adolescence may be a sensitive period for spiritual development (Good & Willoughby, 2008). Some studies and meta-analyses link spirituality more closely to health and life satisfaction (Dankulincova Veselska et al., 2018; Yaden et al., 2022), whereas others find conventional religious involvement more predictive of adolescent outcomes (Yonker et al., 2012), with most of the evidence coming from Western settings. These links also change as adolescents develop and as globalization and online life reshape where young people find meaning and belonging (Jensen, 2021; McClure, 2017).

In South-Eastern Europe, adolescent well-being and religion have mostly been studied separately. Adolescent well-being has been examined across the region (Lim et al., 2017; Raboteg-Šarić et al., 2009), and its strong religious traditions are well documented (Dušanić, 2023; Filipović & Rihtar, 2023), but the two are rarely brought together. The present study therefore examined whether, among adolescents in the Republic of Srpska, (a) religiosity and spirituality explain variance in life satisfaction beyond

demographics and day-to-day well-being, and (b) boys and girls differ on these variables.

Method

Participants and Procedure

The sample comprised 1,289 adolescents from the Republic of Srpska (Bosnia and Herzegovina) identifying as Orthodox (93.6%), Muslim (5.0%), or Catholic (1.3%). Of these, 63.8% were female, and ages ranged from 14 to 19 years ($M = 15.67$, $SD = 1.28$). Data were collected online in schools by convenience sampling as part of the ORBIT study. Participation was voluntary, and students gave informed consent. The study was approved by the Ministry of Education and Culture of the Republic of Srpska (No. 07.051/052-4687-1/25).

Measures

Life satisfaction was assessed with the single-item Cantril Ladder (Cantril, 1965; Levin & Currie, 2014). Day-to-day well-being was assessed with the five-item WHO-5 Well-Being Index (Topp et al., 2015; α = .86). Spirituality was measured with the eight-item spiritual health scale from the Health Behaviour in School-aged Children study (Michaelson et al., 2016; α = .84), and religiosity was measured with the five-item Centrality of Religiosity Scale (CRS-5; Huber & Huber, 2012; α = .82).

Analytic Strategy

We computed Welch's *t* tests with Cohen's *d* for gender differences (effectsize; Ben-Shachar et al., 2020), partial correlations controlling for age and gender (ppcor; Kim, 2015), and a hierarchical regression predicting life satisfaction in three steps (Step 1: age and gender; Step 2: well-being; Step 3: spirituality and religiosity), all using R 4.6.1 (R Core Team, 2026).

Results

Boys reported higher life satisfaction ($t(998) = 6.53$, $d = 0.37$) and well-being ($t(972) = 12.86$, $d = 0.74$), whereas girls reported higher spirituality ($t(774) = 4.68$, $d = 0.29$) and religiosity ($t(899) = 5.94$, $d = 0.35$), all $p < .001$. Controlling for age and gender, life satisfaction correlated strongly with well-being and weakly with spirituality and religiosity, while well-being correlated weakly with both, and spirituality and religiosity correlated strongly with each other (Table 1).

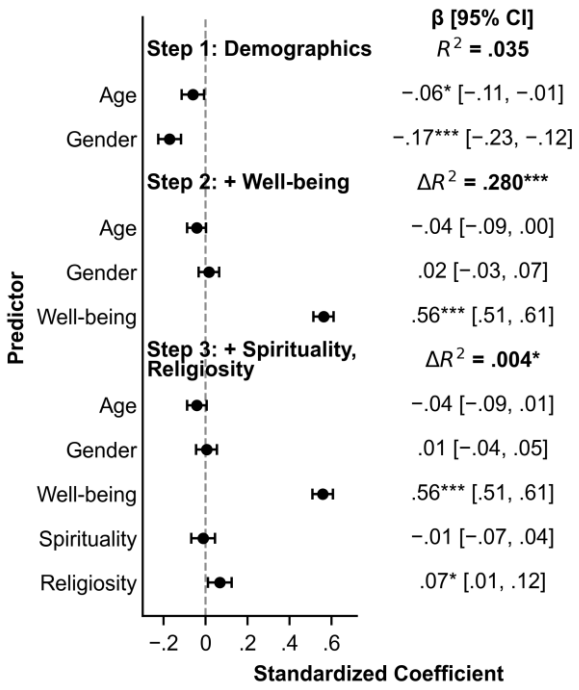
Table 1: Partial correlations among study variables controlling for age and gender.

Variable pair	*r*	95% CI	*p*
Life satisfaction–Well-being	.54	[.50, .58]	< .001
Life satisfaction–Spirituality	.09	[.03, .14]	.001
Life satisfaction–Religiosity	.10	[.05, .16]	< .001
Well-being–Spirituality	.11	[.06, .17]	< .001
Well-being–Religiosity	.07	[.02, .13]	.008
Spirituality–Religiosity	.58	[.54, .61]	< .001

Note. CIs are computed via Fisher's *z*.

Demographics (Step 1) explained 3.5% of variance in life satisfaction (Figure 1). Well-being (Step 2) added 28 percentage points, and spirituality and religiosity (Step 3) added a small increment. In the final model, only well-being and religiosity remained significant unique predictors (βs = .56 and .07), and the gender difference in life satisfaction was no longer significant once well-being was entered (Step 2).

Figure 1: Hierarchical regression predicting life satisfaction.



Note. Error bars are 95% confidence intervals. Gender coded 1 = male, 2 = female. Step 2 $\Delta R^2 = .280$, $F(1, 1285) = 524.99$, $p < .001$. Step 3 $\Delta R^2 = .004$, $F(2, 1283) = 3.56$, $p = .029$. $^{*}p < .05$. $^{***}p < .001$.

Discussion and Conclusion

Adolescents who recently felt and functioned well judged their lives more favorably, and the two indicators behaved as related but distinct facets of subjective well-being, as in adult samples (Grimes et al., 2026). Against that background, religiosity and spirituality contributed relatively little.

Considered separately, both constructs showed small adjusted correlations with life satisfaction, in line with the small associations meta-analyses typically report (Yaden et al., 2022; Yonker et al., 2012). The two constructs diverged, however, once other variables were controlled for. Spirituality became nonsignificant once well-being or religiosity was controlled for, whereas religiosity remained significant in both cases. This differs from a Slovak sample in which spirituality but not religiosity was significantly associated with life satisfaction (Dankulincova Veselska et al., 2018) but matches meta-analytic evidence favoring conventional religious involvement (Yonker et al., 2012). A contextual reading is that, in a sample that is over 90% Orthodox, religiosity may be a socially valued default (Gebauer et al., 2012). The spirituality result warrants caution because the scale's factor structure is not stable across countries (Michaelson et al., 2016).

Boys' advantage in life satisfaction is consistent with evidence that adolescent life satisfaction declines more steeply among girls (Daly, 2022), and girls' greater religiosity and spirituality coexisted with lower well-being.

The cross-sectional design leaves directionality open. All measures were single-session self-reports, life satisfaction rested on a single item, and the WHO-5 captures only positive experience. Longitudinal designs and better measures of adolescent spirituality would put these findings on firmer ground.

Of the factors examined here, adolescents' life evaluations were tied most closely to how they feel and function day to day, with religiosity contributing a small amount beyond that and spirituality contributing nothing separable from the two. Efforts to support adolescent flourishing should therefore attend first to everyday well-being while recognizing that religiosity's modest role may be specific to settings where religion is widely shared.

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