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Basic Psychological Needs As Predictors of Self-Handicapping Behaviors^{1*}

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Abstract

The purpose of this paper was to examine the relationship between the basic psychological needs related to satisfaction and frustration with various types of self-handicapping behaviors. The sample consisted of 518 adults ($M_{age} = 35.87$, $SD = 10.36$), 108 of which (20.8%) declared themselves as male. The instruments used were the Basic Psychological Needs Satisfaction and Frustration Scale (BPNSFS), and the Self-Handicapping questionnaire (SH). The results show that the frustrations of the basic psychological needs, on average, correlate more strongly with self-handicapping behaviors, than with their satisfaction. In addition, in the hierarchical regression models, frustrations of the basic psychological needs prove to be stronger predictors of self-handicapping behaviors than low satisfaction levels of the same needs. In general, competence frustration is the strongest predictor of all forms of self-handicapping behaviors, while relatedness frustration increases in significance in its relation to self-handicapping behaviors in interpersonal relationships. Autonomy frustration shows relevance in explaining all forms of self-handicapping behaviors, although slightly weaker than competence and relatedness frustration. These findings indicate the salience of the frustration of the basic psychological needs in various self-handicapping behaviors, and provide more detailed information on the value of each basic psychological need in the tested relations.

Keywords: self-determination theory, basic psychological needs, self-handicapping behaviors

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Basic Psychological Needs As Predictors of Self-Handicapping Behaviors

The two constructs explored in this study are the Basic Psychological Needs, according to the Self-determination theory (SDT; Deci & Ryan, 1985) and self-handicapping behaviors, with the aim of establishing and understanding the connection between these complex phenomena. Considering the wide network of human faculties that serve as a drive for different types of behaviors, the satisfaction and frustration of the basic psychological needs could provide a comprehensive clarification of the underlying factors of various self-handicapping behaviors. Since its inception (Jones & Berglas, 1978), it was stated that individuals high on self-handicapping behaviors are mostly concerned with competence, particularly in situations in which their abilities might be challenged. However, limited attention has been given to the potential influence of autonomy and relatedness on self-handicapping behaviors. We seek to confirm, but also to expand the scope of the investigation by examining the influence of competence, autonomy and relatedness as universal needs that can be either satisfied or frustrated, on self-handicapping behaviors.

Basic psychological needs theory

As a macro theory of human motivation, SDT (Deci & Ryan, 1985) is concerned with issues such as personality development, self-regulation, universal psychological needs, life goals, aspirations and social conditions that have the potential to either facilitate or hinder human flourishing (Ryan & Deci, 2017). SDT maintains that a consideration of innate psychological needs for autonomy, competence and relatedness is essential to understanding human motivation (Ryan & Deci, 2000). Within the broad framework of SDT, a central “mini-theory” was formulated called Basic Psychological Needs Theory (BPNT; Ryan & Deci, 2017) which identified the three needs and defined them as psychological nutrients essential for individuals’ adjustment, integrity, and growth (Ryan, 1995). Furthermore, a specific desire can only be assigned the status of a basic psychological need when its satisfaction is not only conducive, but essential for one’s well-being, while its frustration increases risk for a wide range of maladaptive outcomes (Ryan & Deci, 2000). The theory takes into account both the satisfaction and frustration of the three needs, with frustration representing a more threatening experience than merely an absence of its satisfaction (Vansteenkiste et al., 2020).

The basic psychological need for autonomy refers to a sense of volition and willingness, and, when satisfied, one experiences feelings of integrity because their actions, thoughts and feelings are self-endorsed, and authentic (Vansteenkiste et al., 2020). Competence refers to our basic need to feel efficacy and mastery and produces a sense of being able to operate effectively within important life contexts

(Ryan & Deci, 2017). Relatedness denotes the feelings of warmth, bonding, care and is satisfied by achieving a connection and significance to others, resulting in a perception of belonging (Baumeister & Leary, 1995).

SDT researchers have examined the relationship between need satisfaction and various outcomes, and have repeatedly shown that need satisfaction was essential for a wide range of positive results, such as optimism (Ionescu & Iacob, 2019), well-being (Šakan et al., 2020), resilience enhancement in traumatic situations (Lera & Abualkibash, 2022).

On the other end of the spectrum, frustration of the basic psychological needs leads to various ill-being indicators, such as depressive symptoms (Pietrek et al., 2022), anxiety (Kormas et al., 2014), and gambling problems (Vuorinen et al., 2022), to name a few.

Self-handicapping behaviors

The other important concept explored in this study are self-handicapping behaviors. Jones and Berglas (1978) argue that people have a tendency to use attributional principles in the service of self-image protection, by actively arranging the circumstances of their behavior in order to protect their conceptions of themselves as competent, intelligent etc. To put it simply, after failing to accomplish the desired task, individuals would associate their failures with the circumstances they created themselves, rather than with their own imperfections. Self-handicapping behaviors have a protective utility, because, as stated by Čolović et al. (2009), a negative evaluation of one's own abilities endangers the general perception of self-worth, and therefore, people use certain strategies to prevent or reduce the possibility of their failures to be attributed to their own competencies.

Behaviors that could serve the purpose of fulfilling self-handicapping behaviors include, but are not limited to, alcohol and drug consumption (Berglas & Jones, 1978), lower study hours (Warner & Moore, 2004), perfectionism, or a tendency to set excessively high standards (Stewart & De George-Walker, 2014), but also internal causes (Clarke & MacCann, 2016), such as anxiety or shyness (Snyder et al., 1985).

A study by Zuckerman & Tsai (2005) explored the relationship between self-handicapping behaviors and basic psychological needs and found that individuals high on self-handicapping behaviors reported a loss in competence satisfaction which, in turn, mediated the relation of self-handicapping behavior and negative mood. The study, building upon the work of Jones and Berglas (1978) stated that self-handicapping behaviors were seen as a product of overconcern with competence, in order to facilitate attributions that are favorable to self-perceived competence. Conversely, people high on self-handicapping behaviors are presumably not concerned with issues such as relatedness and autonomy (Zuckerman & Tsai, 2005). In contrast, researchers also examined the relationship between autonomous and controlled regulation within SDT and self-handicapping behaviors and found that

individuals who tend to be lower in self-determination, that is, have more controlled ways of regulation, engage in self-handicapping behaviors more frequently (Lewis & Neighbors, 2005). In addition, Knee and Zuckerman (1998) came to similar conclusions stating that individuals with high levels of autonomy and low control exhibited less self-handicapping behaviors.

The present study

The present study used a more detailed version of the self-handicapping scale which addresses both internal and external causes of self-handicapping behaviors, but also separates them into two domains: achievement situations and interpersonal relationships. Internal causes of self-handicapping behaviors include attributions to one's own personality traits or characteristics, such as shyness, clumsiness, insecurities etc. External causes of self-handicapping behaviors deal with the creation of obstacles in the outside situation itself. The domain of interpersonal relationships describes those contexts in which stable, emotional relationships are formed, and in which interpersonal problems could occur. Achievement situations relate to the attainment of goals and contexts which constantly test one's perception of personal abilities (Čolović et al., 2009).

Considering this, it seems appropriate to establish a relationship between all aspects of basic psychological needs with self-handicapping behaviors. The findings of previous research, as stated above (Knee & Zuckerman, 1998; Lewis & Neighbors, 2005; Zuckerman & Tsai, 2005), indicate that self-handicapping behaviors are strategies that are related to unmet basic psychological needs, or at least, their low satisfaction. However, some ambiguity in comprehending such a complex relationship still remains. Mainly, it is still unclear whether it is the low satisfaction or the actual frustration of the needs that better predict self-handicapping behaviors. This study seeks to expand on the existing literature by filling this gap and determining the unique contributions of both satisfaction and frustration of the basic psychological needs in their relationship to self-handicapping behaviors. Also, the basic psychological need for relatedness remains largely unexamined, hence it appears applicable to explore its connection to such strategies, given that self-handicapping behaviors could occur in interpersonal relationships, as well.

Therefore, the purpose of this study is to examine the relationship between different types of self-handicapping behaviors and the basic psychological needs and to explore the unique predictive values of both need satisfaction and frustration in relation to a range of self-handicapping behaviors in situations or contexts in which they might occur. The study was conducted on an adult sample. Consequently, by investigating these constructs within different life domains, such as employment or unemployment, adult age, and marriage, we aim to obtain a more comprehensive grasp of their nature.

Method

Sample and procedure

The sample consisted of 518 participants, 407 (78.6%) of which declared themselves as female, 108 (20.8%) as male, and 3 (0.6%) decided not to disclose their gender. The average age is 35.87 (18-65, $SD = 10.36$). The relationship status of the participants is as follows: 179 (34.6%) are married, 159 (31%) are single, 111 (21.6%) are in a relationship, but not married, 64 (12.5%) are in a civil union, and 5 (1%) are widowed. 436 (84.2%) are employed, and 82 (15.8%) are unemployed. The sample was gathered online, participation was voluntary and participants received no compensation. Prior to participation, informed consent was obtained from all participants.

Instruments and variables

The Basic Psychological Needs Satisfaction and Frustration Scale (BPNFS; Chen et al., 2015). It contains six subscales assessing: *autonomy satisfaction* ($\alpha = .78$, 4 items, ex. I feel my choices express who I really am), *competence satisfaction* ($\alpha = .81$, 4 items, ex. I feel capable at what I do), *relatedness satisfaction* ($\alpha = .80$, 4 items, ex. I feel that the people I care about also care about me), *autonomy frustration* ($\alpha = .82$, 4 items, ex. I feel forced to do many things I wouldn't choose to do), *competence frustration* ($\alpha = .81$, 4 items, ex. I feel like a failure because of the mistakes I make) and *relatedness frustration* ($\alpha = .71$, 4 items, ex. I feel the relationships I have are just superficial). The provided Cronbach's alpha coefficients, from the present study, are satisfactory. Participants registered their responses on a 5-point Likert scale ranging from 1 - *I completely disagree* to 5 - *I completely agree*. BPNFS was translated and validated on a Serbian sample, providing a 6-factor solution and promising psychometric characteristics (Šakan, 2020).

Self-handicapping questionnaire (SH; original Serbian name: Upitnik za procenu samohendikepiranja, Čolović et al., 2009). It assesses four different types of self-handicapping behaviors: *external self-handicapping behaviors in interpersonal relationships* ($\alpha = .73$, 10 items, ex. I'd be more successful in romantic relationships if I weren't attracted to people who are unavailable), *internal self-handicapping behaviors in interpersonal relationships* ($\alpha = .87$, 12 items, ex. My shyness is so pronounced that it's better for me to avoid contact with others), *external self-handicapping behaviors in achievement situations* ($\alpha = .77$, 5 items, ex. If I didn't have such a bad relationship with my superiors, I'd be more successful) and *internal self-handicapping behaviors in achievement situations* ($\alpha = .71$, 7 items, ex. I have a tendency to give up on things if I can't do them perfectly). By summing the scores on all subscales, we get *total self-handicapping behaviors* ($\alpha = .91$). The provided Cronbach's alpha coefficients, from the present study, are satisfactory. This

questionnaire was validated by Čolović et al. (2009) on a Serbian sample showing good psychometric properties. Participants registered their responses on a 5-point Likert scale ranging from 1 (I completely disagree) to 5 (I completely agree).

Set of questions on socio-demographic characteristics. The participants were asked to provide information about their age, gender, employment status and current relationship status (single, divorced, married, in a civil union and in a relationship, but unmarried). The socio-demographic variables were coded as follows: “gender: 1 – *male*, 2 – *female*”, “employment status: 1 – *employed*, 2 – *unemployed*”. The variable “relationship status” was recoded into binary categories with the intention of reflecting the current state of romantic partnership, i.e., single and divorced participants were lumped into one category describing those individuals who are not currently involved in a relationship, and participants who declared themselves as “married”, “in a civil union”, or “in a relationship, but not married”, were joined into a separate category. These categories were labeled as “1 – *single*”, and “2 – *in a relationship*”, respectively.

Statistical analysis

All statistical analyses were conducted in SPSS version 20. Descriptive statistics, Pearson product-moment correlations and Hierarchical Multiple Regression Analysis (HMRA) were used.

Correlation indices were computed to determine the strength of the association among all used variables, that is, both basic psychological need satisfaction and frustration, and all types of self-handicapping behaviors and their respective domains. In order to assess the predictive value of each need satisfaction/frustration relative to a range of self-handicapping behaviors, HMRA was used. Five different models were tested. First model used the total score on all self-handicapping behaviors as the criterion variable. The following four models were assessed using the remaining specific types of self-handicapping behaviors and their respective domains as dependent variables. In the first step, for each model, the following covariates were added: age, gender, employment and relationship status, with the removal of those participants who proclaimed their relationship status as ‘widowed’ due to a very small sample size. In the second step, autonomy, competence and relatedness satisfaction were added, and in the last step the frustration of the three needs were included.

Results

Table 1
Descriptive measures of all variables used in the study

	<i>N</i>	<i>min – max</i>	<i>M</i>	<i>SD</i>	<i>Sk</i>	<i>Ku</i>
Autonomy satisfaction	518	6 – 20	14.77	3.12	-.51	-.23
Competence satisfaction	518	5 – 20	16.94	2.50	-.98	1.32
Relatedness satisfaction	518	8 – 20	17.33	2.58	-1.01	.68
Autonomy frustration	518	4 – 20	11.54	3.95	.24	-.67
Competence frustration	518	4 – 20	7.77	3.57	1.08	.54
Relatedness frustration	518	4 – 19	7.63	3.00	.79	.14
External self-handicapping behaviors in interpersonal relationships	518	10 – 44	17.86	6.11	1.15	1.22
Internal self-handicapping behaviors in interpersonal relationships	518	12 – 53	22.41	9.26	.87	-.01
External self-handicapping behaviors in achievement situations	518	5 – 25	10.13	4.29	.87	.34
Internal self-handicapping behaviors in achievement situations	518	7 – 34	18.47	5.73	.31	-.52
Total self-handicapping behaviors	518	34 – 140	68.89	20.73	.72	.09

Note. *Sk* - Skewness; *Ku* – Kurtosis.

The descriptive measures presented in Table 1 indicate that there are no significant deviations from the normality of distribution, if we consider the acceptable range for skewness and kurtosis to fall between -2 and +2 (Gravetter & Wallnau, 2014; Trochim & Donelly, 2006).

Table 2
Intercorrelations among all variables used

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1.										
2.	.48									
3.	.43	.40								
4.	-.56	-.32	-.35							
5.	-.47	-.65	-.44	.51						
6.	-.40	-.40	-.65	.45	.54					
7.	-.24	-.24	-.32	.30	.40	.41				
8.	-.34	-.46	-.41	.38	.59	.43	.53			
9.	-.38	-.34	-.35	.45	.54	.50	.52	.60		
10.	-.28	-.40	-.27	.38	.54	.37	.48	.58	.53	
11.	-.38	-.46	-.42	.45	.64	.56	.77	.89	.77	.79

Note. 1. Autonomy satisfaction; 2. Competence satisfaction; 3. Relatedness satisfaction; 4. Autonomy frustration; 5. Competence frustration; 6. Relatedness frustration; 7. External self-handicapping behaviors in interpersonal relationships; 8. Internal self-handicapping behaviors in interpersonal relationships; 9. External self-handicapping behaviors in achievement situations; 10. Internal self-handicapping behaviors in achievement situations; 11. Total self-handicapping behaviors; all given correlations are significant at $p < .001$ level.

Results of the correlation analysis (Table 2) indicate statistical significance between all specific factors of self-handicapping behaviors, as well as the total self-handicapping behaviors score with all basic psychological need satisfaction/frustration variables. Self-handicapping behaviors subscales all correlate significantly and positively with autonomy, competence and relatedness satisfaction, and negatively with the frustration of the same dimensions. Total self-handicapping behaviors show the strongest positive correlation with competence frustration and with relatedness frustration. In general, basic psychological needs for competence and relatedness are more related to a wide range of self-handicapping behaviors than the need for autonomy. A range of small to moderate negative correlations between autonomy satisfaction and different types of self-handicapping behaviors were found. Correlations between autonomy frustration fall into a slightly higher range, in relation to self-handicapping behaviors.

Table 3
Prediction of total self-handicapping behaviors based on age, gender, relationships status, employment, satisfaction and frustration of the basic psychological needs

Block	Predictors	β	p	Model summary
1.	Age	-.08	.06	
	Gender	-.06	.16	
	Relationship status	-.18	.00	$R = .27, R^2 = .06, F(4, 503) = 9.61, p < .001$
	Employment	.13	.00	

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2.	Age	-.09	.08	
	Gender	.07	.08	
	Relationship status	-.11	.00	
	Employment	.09	.02	
	Autonomy satisfaction	-.17	.00	$R = .57, R^2 = .32, F(7, 500) = 35.67, p < .001, \Delta R^2 = .26, p < .001$
	Competence satisfaction	-.25	.00	
	Relatedness satisfaction	-.24	.00	
3.	Age	-.07	.03	
	Gender	-.09	.01	
	Relationship status	-.10	.00	
	Employment	.06	.09	
	Autonomy satisfaction	-.01	.84	
	Competence satisfaction	-.04	.32	$R = .72, R^2 = .51, F(10, 497) = 53.99, p < .001, \Delta R^2 = .19, p < .001$
	Relatedness satisfaction	.00	.99	
	Autonomy frustration	.15	.00	
	Competence frustration	.36	.00	
	Relatedness frustration	.27	.00	

As presented in Table 3, the set of predictors explains 51% of the variance in total self-handicapping behaviors as the criterion variable, after the addition of autonomy, competence and relatedness frustration in the final step. The inclusion of the need frustration variables rendered autonomy, competence and relatedness satisfaction insignificant. With their addition, the strongest partial contribution to the model is accounted by competence frustration, followed by relatedness frustration and then by autonomy frustration. Gender, relationship status and age are also significant, indicating that younger participants, males and those who are currently not in a romantic relationship are more prone to self-handicapping behaviors in general, although their contributions are very modest.

Table 4

Prediction of internal and external self-handicapping behaviors in interpersonal relationships based on age, gender, relationships status, employment, satisfaction and frustration of the basic psychological needs

Block	Predictors	Internal self-handicapping behaviors in interpersonal relationships		External self-handicapping behaviors in interpersonal relationships	
		β	p	β	p
1	Age	-.11	.13	.03	.48
	Gender	-.01	.92	-.16	.00
	Relationship status	-.21	.00	-.23	.00
	Employment	.11	.02	.06	.12
Model summary		$R = .28, R^2 = .07, F(4, 503) = 10.75, p < .001$		$R = .31, R^2 = .10, F(4, 506) = 10.73, p < .001$	
2	Age	-.12	.02	-.05	.25
	Gender	-.01	.78	-.15	.00
	Relationship status	-.15	.00	-.20	.00
	Employment	.06	.11	.04	.32
	Autonomy satisfaction	-.10	.02	-.12	.01
	Competence satisfaction	-.27	.00	-.07	.16
	Relatedness satisfaction	-.25	.00	-.20	.00
	Model summary		$R = .57, R^2 = .32, F(3, 500) = 34.28, p < .001, \Delta R^2 = .25, p < .001$		$R = .45, R^2 = .19, F(7, 503) = 17.71, p < .001, \Delta R^2 = .09, p < .001$
3	Age	-.10	.01	-.04	.38
	Gender	.01	.86	-.17	.00
	Relationship status	-.14	.00	-.19	.00
	Employment	.04	.30	.02	.60
	Autonomy satisfaction	.02	.70	-.01	.86
	Competence satisfaction	-.10	.03	.06	.23
	Relatedness satisfaction	-.05	.32	-.01	.86
	Autonomy frustration	.10	.03	.11	.03
	Competence frustration	.29	.00	.23	.00
	Relatedness frustration	.25	.00	.24	.00
Model summary		$R = .67, R^2 = .44, F(10, 497) = 41.07, p < .001, \Delta R^2 = .21, p < .001, \Delta R^2 = .11, p = .12, p < .001$		$R = .55, R^2 = .29, F(10, 497) = 21.64, p < .001, \Delta R^2 = .11, p < .001$	

The results of HMRA when internal and external self-handicapping behaviors in interpersonal relationships were used as criterion variables are presented in Table 4. The predictors explain 44% of the variance of internal self-handicapping behaviors in interpersonal relationships. The strongest unique contribution is yielded by competence frustration, followed by relatedness frustration. Autonomy frustration has the lowest contribution with borderline significance. In this case, competence satisfaction remains statistically significant. Among the covariates, in the final model, age and relationship status remain relevant, meaning that younger participants, and those not involved in a romantic relationship, are more susceptible to internal self-handicapping behaviors in interpersonal relationships.

When external self-handicapping behaviors in interpersonal relationships was used as a criterion variable, the final model explains 29% of its variance, with the inclusion of autonomy, competence and relatedness frustration in the final step. Relatedness frustration has the biggest partial contribution to the model, followed by competence frustration, and, at last, autonomy frustration. Relationship status and gender were significant contributors as well, meaning that males and those who are not in a relationship are more prone to external self-handicapping behaviors in interpersonal relationships.

Table 5

Prediction of internal and external self-handicapping behaviors in achievement situations based on age, gender, relationships status, employment, satisfaction and frustration of the basic psychological needs

Block	Predictors	Internal self-handicapping behaviors in achievement situations		External self-handicapping behaviors in achievement situations	
		β	p	β	p
1	Age	-.12	.01	.05	.23
	Gender	-.02	.69	-.04	.56
	Relationship status	-.03	.56	-.04	.40
	Employment	.14	.00	.12	.01
Model summary		$R = .21, R^2 = .04, F(4, 503) = 5.65, p < .001$		$R = .14, R^2 = .01, F(4, 506) = 2.1, p < .001$	
2	Age	-.12	.01	.04	.36
	Gender	-.03	.48	.03	.49
	Relationship status	.04	.40	-.02	.67
	Employment	.11	.01	.09	.02
	Autonomy satisfaction	-.12	.01	-.23	.00
	Competence satisfaction	-.28	.00	-.15	.00
	Relatedness satisfaction	-.11	.02	-.17	.00

		$R = .46, R^2 = .20, F(7, 500)$	$R = .46, R^2 = .20, F(7, 503)$
Model summary		$= 19.54, p < .001, \Delta R^2 = .16, p < .001$	$= 19.10, p < .001, \Delta R^2 = .19, p < .001$
3	Age	-.10	.01
	Gender	-.05	.21
	Relationship status	.03	.40
	Employment	.08	.04
	Autonomy satisfaction	.03	.59
	Competence satisfaction	-.11	.03
	Relatedness satisfaction	.03	.55
	Autonomy frustration	.17	.00
	Competence frustration	.33	.00
	Relatedness frustration	.11	.05
Model summary		$R = .58, R^2 = .32, F(10, 497)$	$R = .62, R^2 = .37, F(10, 497)$
		$= 25.02, p < .001, \Delta R^2 = .12, p < .001$	$= 31.21, p < .001, \Delta R^2 = .17, p < .001$

In Table 5 the results of HMRA in prediction of internal and external self-handicapping behaviors in achievement situations are presented. First, the internal self-handicapping behaviors in achievement situations was used as a criterion variable, and 32% of its variance is explained by the predictors. In this case, with the addition of the need frustration variables, a significant change was established. The most significant partial coefficient was competence frustration, followed by autonomy frustration, and relatedness frustration, and competence satisfaction with borderline significance. Age and employment status showed significance, with younger and unemployed participants being more likely to engage in these particular self-handicapping behaviors. However, the beta coefficient of employment status is modest.

Finally, external self-handicapping behaviors in achievement situations was used as a criterion variable. The set of predictors explains 37% of its variance. The inclusion of the frustration variables in the final step rendered all basic psychological need satisfaction variables insignificant. The unique predictive value of need frustration variables is as follows: competence frustration, relatedness frustration, autonomy frustration.

Discussion

The main purpose of this study was to determine the unique predictive value of each basic psychological need and its satisfaction or frustration in relation to multiple types of self-handicapping behaviors.

Based on the results, it can be seen that mostly the frustrations of the basic psychological needs predict a broad array of self-handicapping behaviors, with each need having a distinctive value in relation to the specific type of self-handicapping behavior. Also, overall, need frustration seems to be more important when predicting self-handicapping behaviors than merely low satisfaction levels of the needs. In addition, basic psychological need frustration variables correlate to a higher degree with all self-handicapping behavior forms than need satisfaction variables. Moreover, competence frustration yields the highest beta coefficient in relation to total self-handicapping behaviors. Upon further inspection of the same criterion variable, relatedness frustration follows competence frustration in its predictive influence, while autonomy frustration consistently produces relatively equal partial contributions to total self-handicapping behaviors, as well as internal and external handicapping behaviors, in both achievement situations and interpersonal relationships. This is consistent with the findings of other research that states that low levels of autonomy are associated with self-handicapping behavior (Knee & Zuckerman, 1998; Lewis & Neighbors, 2005). Specifically, a sense of autonomy is established when one feels as if their actions are self-endorsed, authentic and an expression of willingness and volition. Considering this, autonomy frustration is a consistent predictor of all types of self-handicapping behaviors, most likely because such behaviors, regardless of situational circumstances, stem from a thwarted sense of personal volition. Therefore, we can conclude that autonomy frustration is related to self-handicapping behaviors, in all contexts, but less than other need frustrations.

When examining the value of each predictor in relation to internal and external self-handicapping behaviors in interpersonal relationships, it becomes apparent that the predictive relevance of relatedness frustration significantly increases to the point of being nearly equal to competence frustration. The prominence of the partial contributions of relatedness frustration might be explained by the proposition that the basic psychological need for relatedness is concerned with feelings of connection to others, belonging, forming partnerships etc. Therefore, those individuals whose need for relatedness is frustrated also tend to engage in self-handicapping behaviors in interpersonal contexts, possibly in order to provide justifications as to why this essential need is being frustrated.

The predictive power of competence frustration remains robust in relation to self-handicapping behaviors in interpersonal relationships, most likely due to the belief that the establishment of such relationships requires specific skills, which could be attributed to a sense of competence. Specifically, when individuals experience competence frustration and perceive themselves as failures, it might contribute to a pronounced tendency to engage in self-handicapping behaviors in interpersonal relationships as well. Competence satisfaction also remains a relevant predictor of internal self-handicapping behaviors in interpersonal relationships, indicating that low levels of the need for competence also lead to self-handicapping behaviors in this context. Hence, such behaviors, when used in interpersonal relationships, could also arise from a frustrated need for competence, and to a lesser degree, its low satisfaction levels. This could be attributed to the relevance of competence

in forming and maintaining such relationships and the likelihood of the already mentioned overlap between achievement situations and interpersonal relationships. This finding further corroborates the results of other studies which established a link between self-efficacy and interpersonal relationships (Chang, 2021; Siciliano, 2016), and suggests that others might place value on one's competencies and efficacy which might contribute positively to interpersonal relationships.

In addition, individuals who are single have a pronounced tendency to self-handicapping behaviors in interpersonal relationships, possibly because they view such a relationship status as undesirable, and are seeking attributions both internally and externally for the given circumstance. Males also engage in self-handicapping behaviors more than females, which is in line with the findings of other researchers (Dietrich, 1995; Hirt et al., 1991; Čolović et al., 2009).

In both internal and external self-handicapping behaviors in achievement situations, competence frustration remains the single largest predictor, confirming the findings of previous researchers (Jones & Berglas, 1978; Zuckerman & Tsai, 2005) which state that those engaging in such behavioral schemes are mostly concerned with their self-image of competence. One could come to the conclusion that this most often occurs when one experiences the frustration of the need for competence, in order to facilitate justifications for undesirable outcomes based on a lack of mastery, abilities etc. In addition, low levels of competence satisfaction also predict internal self-handicapping behaviors in achievement situations, but in an inferior manner compared to competence frustration. Theoretically, this finding is very consistent, because the self-handicapping behavior variables related to achievement situations emphasize self-efficacy, competence, success in important life contexts, and personal habits related to situations in which personal skills and mastery could contribute to accomplishment.

However, in the case of both external and internal self-handicapping behaviors in achievement situations, relatedness frustration is also a relevant predictor, likely due to the possibility of attributing an undesirable outcome in achievement situations to the influence of individuals with whom our relationship is of unsatisfactory quality (e.g., one fails to get a promotion because their boss dislikes them). This finding suggests plausibility of an existing overlap between certain achievement situations and interpersonal relationships.

Also, employment status becomes relevant, with the state of current unemployment being a significant predictor of internal self-handicapping behaviors in achievement situations. One could assume that this finding is related to the negative way in which society, and the individual view unemployment, making it an undesirable outcome.

This study is not without its limitations. First, the sample doesn't adequately represent the parameters of the entire population. The educational background of the participants, and other relevant measures of socio-economic status were unknown. These particular measures could prove useful when assessing various links to self-handicapping behaviors and the basic psychological needs. Also, the Self-handicapping questionnaire used in this study is different from that of other

researchers (e.g., Clarke & MacCann, 2016; McCrea et al., 2008), so further studies are required in order to provide more adequate comparisons between the instruments. Additionally, the high correlations between the first and second order factors bring into question the usage of the subscales, i.e., such high correlations could indicate redundancy of the subscales. Therefore, studies that further elaborate the dimensionality of the scale are needed, and caution is advised when making inferences related to the specific domains of the scale.

Conclusion

The findings of this study shed further light on the wide range of effects that frustration of the basic psychological needs has in relation to various self-handicapping behaviors and the contexts in which these forms of behaviors could be used. It also contributes to a more detailed comprehension of self-handicapping behaviors by expanding the knowledge of the many possible underlying factors that could serve as a drive for such behavior. Therefore, we conclude that various self-handicapping behaviors are principally driven by a sense that our basic psychological needs are being frustrated. Such a result further corroborates the hypothesis within SDT which states that the frustration of the basic psychological needs leads to maladaptive behaviors. It is worth noting that, according to self-determination theory (Ryan & Deci, 2017), basic psychological needs, and their satisfaction or frustration, are susceptible to the influence of environmental and cultural factors, meaning that they might, in turn, also have an effect on self-handicapping behaviors. The possible practical implication of these findings is in the development of interventions that could prevent self-handicapping behaviors from occurring.

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Bazične psihološke potrebe kao prediktori samohendikepirajućih ponašanja

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Apstrakt

Cilj ovog rada bio je da se ispitaju relacije između bazičnih psiholoških potreba i različitih oblika samohendikepirajućih ponašanja. Uzorak se sastojao od 518 ispitanika ($M_{starost} = 35.87$, $SD = 10.36$), od kojih je 108 (20.8%) muškog pola. Korišćeni su sledeći instrumetni: Upitnik za merenje bazičnih psiholoških potreba (BPNSFS) koji meri: zadovoljenje potrebe za autonomijom, kompetencijom, i povezanošću, kao i osujećenost istih, i Upitnik za procenu samohendikepiranja (SH) koji meri: samohendikepiranje spoljašnjim i unutrašnjim uzrocima u interpersonalnim odnosima, i samohendikepiranje spoljašnjim i unutrašnjim uzorcima u situacijama postignuća. Rezultati pokazuju da osujećenost bazičnih psiholoških potreba, u proseku, jače korelira sa samohendikepirajućim ponašanjem, nego zadovoljenje potreba. Takođe, putem višestruke hijerarhijske regresione analize registrovano je da je u objašnjenju samohendikepirajućih ponašanja parcijalni doprinos osujećenosti bazičnih psiholoških potreba veći nego niski nivoi zadovoljenja potreba. Osujećenost potrebe za kompetencijom je najjači prediktor svih oblika samohendikepirajućih ponašanja, dok vrednost osujećenosti potrebe za povezanošću raste pri predviđanju samohendikepirajućih ponašanja u interpersonalnim odnosima. Osujećenost potrebe za autonomijom je značajan prediktor svih oblika samohendikepirajućih ponašanja, ali u slabijoj meri od osujećenosti ostale dve bazične psihološke potrebe. Ovakvi rezultati svedoče o važnosti osujećenosti bazičnih psiholoških potreba pri objašnjenju različitih oblika samohendikepirajućih ponašanja, i pružaju dublji uvid u faktore koji stoje u osnovi ovakih ponašajnih strategija. Takođe, doprinose proširenju postojećeg znanja tako što osvetljavaju značaj pojedinačnih bazičnih psiholoških potreba u odnosu na samohendikeprajuće ponašanje i različite kontekste u kojima se javljaju.

Ključne reči: teorija samoodređenja, bazične psihološke potrebe, samohendikepirajuće ponašanje

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Does Conformity Really Exist? Examination of Informational Social Influence in the Recognition of the Color Order^{1*}

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Abstract

This research examines the informational social influence in situations involving the recognition of the color order. Also, this study examines the differences in selection of the stimuli between the two measures: in the first measure there was no answer from the artist, and in the second, there was. The sample consists of 50 subjects, ages 18 to 65 years ($M = 41.5$, $SD = 15.8$). In the first phase, the subjects were shown standard stimuli lasting 1 second, and their task was to remember them and then recognize them among the four offered examples that they were exposed to for 3 seconds. The second phase was identical to the first, and the only difference was the presence of a response given by the artist. The results show that 23% cases were influenced by conformity. The analysis of the subject's responses to the variable "stimulus selection" shows that there is a statistically significant difference in the average selection of stimuli between the situation with and without the artist's response ($t(49) = -3.06$, $p = .004$, $d = -0.432$). A negative t-test value shows that subjects would choose the stimulus that the artist marked as correct more often in the situation when it is listed. Further research is recommended that would include the use of a more homogeneous sample in terms of age, the use of experimenter associates and insisting on the personal importance of the involvement of research participants.

Keywords: conformity, informational social influence, stimulus selection, recognition of the color order

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Does Conformity Really Exist? Examination of Informational Social Influence in the Recognition of the Color Order

Conformity is a type of social influence that researchers began to pay attention to with the appearance of the first experiments in social psychology and that manages to maintain their interests even today. The results of the research (Asch, 1955, 1956; Baron et al., 1996; Đorđević, 2022; Crutchfield, 1955; Sherif, 1937; Rot, 1960; as cited in Rot 2015) done so far show that conformity is a powerful phenomenon, but all of them are showing weakness, which is reflected in the fact that they do not confirm the existence of the conformity phenomenon, but only presume that it exists. This study introduces the variable stimulus selection into the field of conformity, with the purpose of solving this problem. Therefore, in addition to the basic problem that is present in all studies of conformity, this study goes a step further and examines the problem that offers additional and direct confirmation of the phenomenon of conformity, in order to get to the fundamental knowledge. The aim of this research is to examine informational social influence with a judgment of the supposed artist in the situation of recognizing the order of colors. Also, this study deals with examining differences in stimulus selection, which is recognized as accurate by the supposed artist, between the two measures: in the first, there is no answer given by the artist and in the second, there is one.

Conformity

Researching conformity began with the appearance of the first experiments in social psychology, and the first study of conformity, Moore's experiment in 1921. stands out (Moore, 1921). The need for social psychologists to research conformity, in its many forms, is stable until this day and many creative and new studies can be found in this field. The reason for studying conformity is the power that social influence has on individuals and crowds (Sulejmanović, 2019), as well as the need to resolve many contradictions that exist in the current knowledge of this phenomenon or to discover novelties that would lead to the opening of new questions about the phenomenon of conformity and to direct future researchers towards new trends of studies in this area.

A comprehensive and whole definition of conformity stands out in Rot's (2003) understanding: conformity means accepting crowd behavior or behavior of the majority because the group demands and expects that kind of behavior or because it presents it as a type of behavior, that is, conformity means readiness to accept direct and indirect group influence, even when there are no realistic and rational reasons for that. Regarding the difficulties, while trying to find one all-encompassing definition of conformity, theorists were coming to different classifications of conformity because they were starting from different criteria. According to the division that takes the form of manifestation as a criterion of distinction, we distinguish conformation that is manifested verbally and conformation that is manifested in action (Rot, 2015).

The next division is into practical conformation and real or complete conformation. One of the mostly studied conformity divisions starts by identifying different kinds of conformity. This gives its two forms and those are normative social influence and informational social influence (Deutsch & Gerard, 1955).

Informational social influence

Informational social influence occurs when we conform to others because we believe that their interpretation of the situation is more accurate than ours, which leads to the behavior and opinion of others becoming a guide that directs us to future actions (Baron & Branscombe, 2011; Deutsch & Gerard, 1955). One of the important features of informational social influence is that it leads to personal acceptance, which means people conform to the behavior of others because they really believe that they are right (Aronson et al., 2005). The best-known example which represents the basis for future research puts in the center of its interest informational social influence; it is Sherif's study on the autokinetic effect (Sherif, 1937). When talking about informational social influence, it is essential to mention the conditions that promote its occurrence. The first and most important condition is the ambiguity of the situation, so that the less clear and more ambiguous the situation, the greater the probability that informational social influence will occur (Aronson et al., 2005). The next condition is the degree of risk of the situation. In situations that require risk, we usually don't have time to think, we aren't sure how to act and sometimes we feel scared and panic, so our only natural reaction is to react as other people do. The final condition is the expertise of other people. The more expert and informed someone is regarding a particular event, the more they will be trusted, respectively, there will be greater conformity to such a person. In certain situations, a person can resist informational social influence, respectively she/he can remain immune to its effect. Taking into account that informational social influence has an effect on a person's behavior and their interpretation of reality, when deciding whether to conform to it, a person takes into consideration whether it is legitimate or accurate. If it is not, the person remains immune to it (Aronson et al., 2005).

Review of previous research

Moore's (1921) examination of the influence of majority and expert opinions on individual judgments represents the first experimental investigation of conformity. It was followed by the appearance of many other experiments in this area, such as Sheriff's experiment, Ash's experiment and others. In Moore's experiment, 95 participants were given a task to decide between two statements, choosing the one that they agreed more with. In the first phase, the participants made an independent choice, and then this phase was repeated after two days, with the aim of determining whether there were significant changes in the attitudes of the participants. The next

phase was carried out after two and a half months, but before that, participants were informed about the choice made by the majority. The last phase was held after two days and was similar to the previous one, but now participants were given a suggestion about the opinion of an expert, who represented a group of people with adequate knowledge about a certain type of judgments. The conclusions reached in this research show that the opinion of the majority and the opinion of experts have an equal influence on ethical and musical judgments, while the influence of the majority was stronger in the situation of linguistic judgments about everyday life.

Sherif's (1937) experiment is based on the illusion of movement of a stationary bright point observed in complete darkness, the so-called autokinetic effect. Subjects were asked to look at a small bright dot about 4.5 meters away from them in a dark room, and then they were asked to estimate how much the bright dot moved. The dot didn't move at all, but during 100 trials the subjects achieved their own stable estimation that differed from person to person and ranged from 2.5 cm to 25 cm. A few days later, the subjects had to judge the movement of the bright spot again, but this time they were in the same room with two or three subjects who gave their answers verbally and after them. The obtained data showed that the size of movement of the bright spot depended on whether the respondents made the estimations independently or in the presence of other respondents. When respondents made estimations in a group, they were more similar to the estimations of other respondents than when they made estimations independently.

Asch (1955, 1956) conducted an experiment to find out whether people would conform in situations when the group's evaluations were clearly wrong. There were between 7 and 9 participants in the group, and the critical subject represented the minority against the unknown majority that were giving wrong answers. The subjects' task was to name which of the three lines was identical to the standard line. The critical subject was the penultimate one to answer. Asch came to the conclusion that almost 37% participants tended to accept the incorrect answers of the group if the other members were united in their answer. In a situation where another critical subject was introduced whose answers could be influenced by the answers of associates, the percentage of respondents who complied dropped to 10.4%. Moreover, in the situation where another critical subject was introduced, who was reminded to always give the correct answers, the percentage of participants who complied dropped to 5.5%. After the experiment was over, critical subjects were interviewed about the reasons for conforming. Based on their answers, we arrive at three categories of respondents who succumbed to pressure - distortion of perception, distortion of judgment and distortion of action. The first category includes participants who had distortions of perception and who claimed to have seen as the majority saw. The second category includes participants who experienced distortion of judgment. Most of the participants belong to this group, they were aware that they saw differently, but they believed that the majority were right, and that they were wrong due to some special circumstances such as poor eyesight, the position from which they evaluated, etc. Elements of informational social influence can be observed in relation to them, because they believed the majority's assessments and therefore corrected

their own. The third category includes respondents who experienced a distortion of action, namely those who firmly believed in the accuracy of their assessment, but conformed because they didn't want to differ from the majority.

Crutchfield (1955) conducted an experiment in which he investigated whether conformation can occur during indirect contact between group members. He studied the influence of majority opinion on various contents, such as perception, beliefs based on scientific authority, opinions and attitudes about social phenomena, self opinion, etc. Crutchfield's technique consisted of forming a group of five subjects who were sitting in the same room, separated from each other by side partitions that allowed them to view a common screen on which the content to be judged was displayed. Subjects expressed agreement or disagreement with certain content by pressing a button, and before giving their answer, they could see the answers given by other subjects. These were not real answers from other subjects, but pre-planned answers prepared in advance by the experimenter. By this procedure Crutchfield showed that the majority presented by an individual, can have an influence on individual judgments.

Rot (2015) conducted research in which he showed that conforming can also occur under the influence of an abstract majority, respectively of the majority that is only said to exist. He examined how much influence a fictitious majority can have on different types of judgments, namely judgments based on perceptual evidence, logical evidence, scientific authority, subjective experience and affective relationship (Rot, 1972; as cited in Rot, 2015). The results of this research showed that the fictitious majority leads to conformity, but that the strength of its influence differs depending on the type of judgment in question. The smallest influence of the fictitious majority was on perceptual judgments, while it was slightly greater on logical judgments, judgments on own behavior and judgments on affective relationships. The greatest influence was manifested in judgments based on scientific authority.

Baron et al. (1996) conducted a study in which participants were tasked with identifying a suspect. A total of 95 participants had thirteen tasks in which they were first shown a male figure of the suspect, in the form of schematized persons, and then they were shown four figures, among which there was the previously shown suspect. The presentation of the stimuli was time-limited to half a second. In the seven critical trials, three collaborators participated who gave wrong answers, but the same answers anteceded the participant. By quickly presenting stimuli and introducing associates who were giving wrong answers there was a vague, unstable and uncertain situation, which favored the manifestation of informational social influence. In addition to this, the researchers varied the importance of the tasks and sought to determine whether informational social influence would be greater in a situation of high or low importance. In a situation of high importance, the respondents were told that they were participating in a test of the ability to recognize suspects and that their results would be used by the police and the court to distinguish between good and bad eyewitnesses. Participants were also told that the person who was most successful in recognition would receive \$20. In the low-importance situation, subjects were told that this was the first suspect recognition study and that it examined how successful people were. The results of the research

showed that in a situation of low importance, conforming occurred in 35% attempts, while in a situation of high importance, conforming occurred in 51% attempts.

A more recent study dealt with examining the informational social influence of a fictitious majority in a face recognition situation (Đorđević, 2022). A total of 150 subjects had the task of remembering the face of a male adult, which has been shown in the first phase of the experiment, and then, in the second phase, to recognize that standard stimulus among four stimuli. The exposure time of the stimuli was limited, so that the standard stimulus was presented for half a second, while the stimuli from the second phase were presented for two and a half seconds. Time limits in the exposure of the stimulus were performed with the aim of making the situation tense, uncertain and ambiguous, in order to create conditions that favor the manifestation of informational social influence. In seven situations out of thirteen, participants were informed about the answer of the fictitious majority before giving their own answer. If the participant accepted the supposed answer of the majority, he would receive a point, and if he didn't accept the answer, he wouldn't receive a point. In this way, the value is operationalized on the conformity scale. This study is also significant in that it introduces the variable of recognition accuracy into the domain of conformity studies and comes to the conclusion that participants are more successful in recognizing faces when they don't receive information about the answer of the fictitious majority. The results of this study show that the rate of conformity with the answers of the majority is 33.1%.

Method

Sample and procedure

The sample of this research is convenient and consists of 50 subjects from the general population. Participants are distributed equally by gender which means that the sample is constituted of 25 females and 25 males. The age range of participants is from 18 to 65 years, with the average age being 41.5 years ($SD = 15.8$).

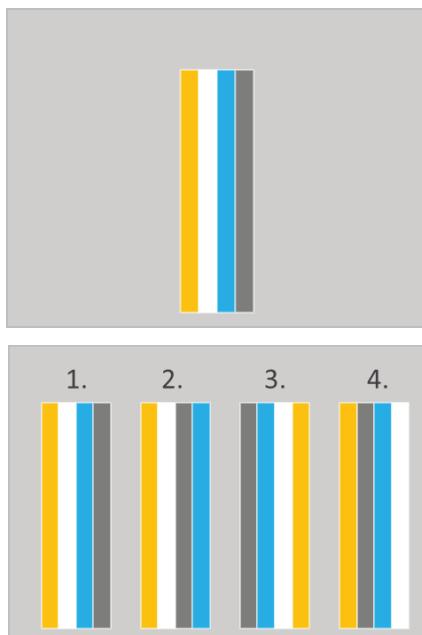
The experiment was conducted in natural conditions. The participants were alone in the room with the researcher and they had the task to memorize the stimuli which were presented on the computer monitor. Likewise, they had a list by which they reinforced the correct answers. At the beginning of the experiment, participants were told that research examines how good people were in recognizing colors and if their memory of colors is identical to the scientific authority in that area, namely the artist. They also received information that artists are extremely good at recognizing even the finest shades of colors and that it's important that they themselves be successful because their scores and scores from artists would be compared (to each other). Participants were first shown a picture of four colors lined up in a specific sequence, and this picture represented standard stimuli and its time of exposition lasted for one second. Their task was to memorize a specific sequence of colors representing standard stimuli and to try to recognize it between four stimuli, one of which was the right one. The time of exposition lasted three seconds. The experiment was conducted in two phases, and in both phases, participants were

exposed to the same stimuli. The one thing that was different in these two phases was the presence or absence of a response from a scientific authority. In the first phase of the experiment, participants were shown six situations in which they received information about the answer from the artist, but that answer was wrong. In the second phase of the experiment, participants were shown the same six situations, only this time they didn't receive information about the answer from the artist. If the participant conformed, he got one point and if there was no conformity, he didn't receive any points. This way, a possible range of scores on the variable of conformity would take values from 0 to 6, whereby, a higher score would indicate a bigger proclivity to conform, while a lower score would indicate a smaller proclivity to conform. The goal of time limitation in stimuli exposure is to make the situation unclear, unspecified, and unstable, so the conditions that are characteristic for informational social influence to be manifested were created.

Stimuli

The stimuli material is made up of 24 pictures on which a specific color order is displayed and the material was constructed for this study. Six pictures represent standard stimuli, that is, the color order participants have to memorize and then recognize. The rest of the 18 pictures represent the color order where standard stimuli are exposed and its choice is considered to be wrong by participants.

Figure 1
Example of stimuli used in the study



Results

Table 1

Descriptive measures for variables used in the study

	<i>N</i>	<i>M</i>	<i>Mdn</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Sk</i>	<i>Ku</i>
Age	50	41.50	43.50	15.77	18	65	-0.14	-1.41
Stimulus selection 1	50	0.84	1.00	0.89	0	3	0.87	0.07
Stimulus selection 2/Conformity	50	1.38	1.00	1.14	0	5	0.65	0.48

Note. Sk – skewness, coefficient of asymmetry; Ku – kurtosis, coefficient of elongation; Stimulus selection 1 – the selection to the stimulus that the artist marked as accurate, measured in situations without an answer from the artist; Stimulus selection 2/Conformity – the selection to the stimulus that the artist marked as accurate, measured in situations with an answer from the artist.

Table 1 shows that variables stimulus selection 1 and stimulus selection 2/conformity have the distribution of measures that do not deviate from normal (the range of values for skewness and kurtosis is +/-1). The distribution of measures on the age variable gives platykurtic distribution because the value of kurtosis is lower than -1. This indicates increased dispersion for results distribution.

Table 2

Distribution of achieved scores on the stimulus selection variable

The distribution of scores on the stimulus selection variable when there is a response from the artist.				The distribution of scores on the stimulus selection variable when there is a response from the artist			
Score	<i>N</i>	%	Cumulative %	Score	<i>N</i>	%	Cumulative %
0	21	42	42.0 %	0	21	26	26
1	19	38	80.0 %	1	19	30	56
2	7	14	94.0 %	2	7	28	84
3	3	6	100.0 %	3	3	14	98
				5	1	2	100.0 %

Table 2 shows that participants aren't represented on all scores of the stimulus selection variable, considering both measurement situations, respectively the one in which there is a response from the artist and the other in which there is no such response. It can be noted that there is a difference in the number, respectively percentage distribution of respondents according to the achieved score on the mentioned variable. When it comes to achieved values on the stimulus selection variable, in the case when there isn't a response from the artist, the participants are represented on negative extreme scores, while their number decreases as the value increases, so that score 4, 5 and 6 hasn't been achieved by anybody. Lower

values in the mentioned situation, i.e., values from 0 to 3 are achieved by 100% of participants, respectively the entire sample. When it comes to the situation in which there is a response from the artist, actually about the situation of conformity, participants are more concentrated towards the lower scores of this variable, and that with the increase in the value, the number of participants decreases. Almost a third of the sample, or 30% of participants, conformed only once. Lower values in the conforming situation, i.e., values from 0 to 3, have been achieved by 84% of participants, while higher values, i.e., values from 4 to 5, have been achieved by 16% of participants. Based on the obtained distribution of participants' responses in the situation that measured conformity, it can be seen that there were 13 participants who didn't conform even once, but also that there were no participants who conformed to the artist's response in all six situations. The average rate of stimulus selection in the measurement situation when there wasn't any response from the artist was 14.3%, while in the measurement situation when there was, respectively in a conforming situation, it was 23%.

It can be concluded that there is a statistically significant difference in an average expression for stimulus selection during recognition of the color order in situations without ($M = .84$, $SD = .89$) and with ($M = 1.38$, $SD = 1.14$) response from an artist ($t(49) = -3.06$, $p = .004$, $d = -0.432$, 95% CI [-.72, -.14]). A negative value of the t-test means that participants are inclined to adapt their response to the artist's response in the second situation, respectively in the situation with an artist's answer. The size effect measure expressed through Cohen's d coefficient shows a medium or typical effect.

Discussion

Taking into account the results of previous research (Baron et al., 1996; Crutchfield, 1955; Đorđević, 2022; Levine et al., 2000; Moor, 1921; Sherif, 1937) which studied informational social influence, it can be seen that they always confirmed its effects, respectively they came to the findings according to which people tend to conform in unclear, uncertain and ambiguous situations. It is characteristic of previous research that the group exerting influence was represented in the form of several associates of the experimenter who gave answers before the naive participant (Asch, 1955, 1956; Baron et al., 1996; Sherif, 1937), while in a lower number of cases, it was about a group with which the participants didn't have direct contact (Crutchfield, 1955) or it is only said that this group exists (Rot, 1972; as cited in Roth, 2015; Đorđević, 2022). Moore's (1921) experiment is specific in that, in addition to the answers of the majority, he also introduces the answers of a scientific authority, as a representative of a group that owns extraordinary knowledge in the field for which it is an expert. As for this study, it went a little wider than standard conformation studies and used the artist's response as the influencing group. In this way, it remained faithful to Moore's way of examining conformity and gave researchers an incentive to show their creativity when choosing a group that exerts influence. In this study the average rate of conformity is 23%. Taking

into consideration that as stimuli pictures showing colors were used that represent the kind of perceptive stimuli, the given rate of 23% of participants who conformed is lower than found in previous research findings in which some kinds of perceptive stimuli were used. The obtained conformity rate didn't pass 30% in those previous studies (Asch, 1955, 1956; Baron et al., 1996; Đorđević, 2022; Crutchfield, 1955; Sherif, 1937; Rot, 1960; as cited in Rot 2015). Something similar occurred in Moor's (1921) experiment, where the percentage of subjects conformed with linguistic judgments was significantly lower in situations when they were influenced by supposed scientific authority, then when they were influenced by supposed majority. Taking into account the existence of such findings, the recommendation for future researchers is to devote themselves to discovering the reasons that lead to the appearance of a slightly lower rate of conformity with the judgment of the artist, when it comes to a certain type of stimulus.

The goal of introducing the variable stimulus selection in the field of conformity is to provide additional and direct support to the phenomenon of conformity, because it provides results on whether participants more often chose the supposed answer of the artist in cases when it was mentioned or when it wasn't presented. Results show that in a situation in which there was an answer from the artist in 23% cases conformation occurred, while in a situation in which there was no answer from the artist in 14.3% cases, there was a matching of the answer between the artist and the participants. The hypothesis of this research, which speaks of the existence of a difference in stimulus selection between two series of measurements – the first in which the artist's response doesn't exist and the second in which it exists, has been confirmed. This result was obtained by using a *t*-test for dependent samples. On the basis of this finding, where the answers of the supposed artist are more often chosen when they are given, it can be concluded that the subject of this study describes conformity, and not something close or similar to it.

Conclusion

One limitation of this study is related to the group exerting influence towards conforming which is presented in the form of an artist. As already mentioned, Moore (1921) also had some difficulties with this group. Together with this, there is a potential limitation of the study, and the question asked is the following: "Should the majority that influences be exclusively used in the research of conformity or several associates of the experimenter, or conversely, should the researchers be given the liberty to show their creativity?". The recommendation for future researchers is a more detailed direction for trying to solve this problem so in that way they can come to solid and established findings about the actual nature of the group making an influence to conform. They should also make an effort to uncover the reasons that contribute to a lesser rate of conformity with the judgment of scientific authority when it comes to a specific kind of stimuli. Another limitation of this study is the one that refers to all experimental research, that is the external validity of results (Fajgelj, 2004). The exposure of pictures showing colors in a specific order with limited exposition time and giving information about the answer by an artist increased the artificiality of the

situation. In this way, the phenomenon of conformity is plucked out from its natural context. The age range of the sample is quite wide, it includes participants from 18 to 65 years old. So, one of the recommendations for future researchers is to examine the phenomenon of conformity on more homogeneous groups in terms of age and compare them with each other. In this study, supposed answers given by artists were used, so the conditions in which it was possible to manifest conformity were created. Future research could be directed towards including associates that would present a united answer, prior to a naive participant, about the stimuli that they recognize as a standard. In this way, besides introducing time limitation in stimuli exposure so the situation could be made unclear, unspecified, and unstable, that is, made convenient to manifest informative social influence, there would also be associates who would perform additional pressure to conform. This would create a normative social influence. The combination of both kinds of social influences could lead to a greater tendency to conform. Another possibility that could lead to a higher percentage of conformity is insisting on the personal importance of the involvement of research participants, because in this way they can become more motivated to give more accurate answers on a given task. This was successfully conducted in the study of Baron and associates, in a way of accentuating participants' answers and giving monetary compensation to the most successful in recognizing the suspect (Baron et al., 1996).

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Da li konformizam stvarno postoji? Ispitivanje informacionog socijalnog uticaja u situaciji prepoznavanja redosleda boja

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Apstrakt

Problem ovog istraživanja je ispitivanje informacionog socijalnog uticaja u situaciji prepoznavanja redosleda boja. Pored ovoga, ova studija se bavi i ispitivanjem razlika u odabiru stimulusa između dve serije merenja: prve u kojoj ne postoji odgovor umetnika i druge u kojoj on postoji. Uzorak sadrži 50 ispitanika, starosti od 18 do 65 godina ($M = 41.5$, $SD = 15.8$). U prvoj fazi svim ispitanicima je pokazan standardni stimulus u trajanju od 1 sekunde, a njihov zadatak je bio da upamte isti i da ga potom prepoznaju među četiri ponuđena primera koja su izlagana 3 sekunde. Druga faza je bila identična prvoj, a jedina razlika je bila u prisustvu umetnikovog odgovora. Rezultati pokazuju da je u 23% slučajeva došlo do ispoljavanja konformiranja. Analiza odgovora ispitanika na varijabli odabir stimulusa pokazuje da postoji statistički značajna razlika u prosečnom odabiru stimulusa u situaciji bez i sa odgovorom umetnika ($t(49) = -3.06$, $p = .004$, $d = -0.432$). Negativna vrednost t -testa pokazuje da ispitanici česće biraju stimulus koji je umetnik označio kao tačan u situaciji kada je on naveden. Preporučuju se dalja istraživanja koja bi uključila korišćenje homogenijeg uzorka u pogledu godina, korišćenje saradnika eksperimentatora i insistiranje na ličnoj važnosti učešća ispitanika u istraživanju.

Ključne reči: konformizam, informacioni socijalni uticaj, odabir stimulusa, prepoznavanje redosleda boja

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Religiosity and Orientation Toward the Present^{1*}

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Abstract

The aim of this research was to examine if religiosity is related to orientations toward the present, to test if it could significantly predict them, and to test if age and educational level can moderate these relationships. The data was collected using The Centrality of Religiosity Scale (CRS-15), The Zimbardo Time Perspective Inventory (ZTPI) and a questionnaire containing questions about basic sociodemographic information about the sample. The sample consisted of 648 participants, both male ($n = 195$) and female ($n = 453$), aged 18–70 ($M = 35.50$, $SD = 11.30$). The results showed that both models in this research are significant. The first model explains 4.1% of the variance of the hedonistic present ($R^2 = .04$, $F_{(2,645)} = 13.90$, $p < .001$) with religiosity ($\beta = .20$, $p < .001$) as a significant predictor. The second model explains 14.7% of the variance of the fatalistic present ($R^2 = .14$, $F_{(2,645)} = 55.48$, $p < .001$) with gender ($\beta = .11$, $p < .01$) and religiosity ($\beta = .38$, $p < .001$) as significant predictors. In this research, age demonstrated moderating effects on the relationship between religiosity and both orientations toward the present, enhancing their positive relationship. When it comes to the educational level, it demonstrates a moderating effect only on the relationship between religiosity and hedonistic present perspective, also enhancing their positive relationship. The results implicate that the concept of the hedonistic present should be revised since it seems like the maladaptive trait of the hedonistic present depends on the way it is guided by the concerns for the future and some previous results suggest a double path that this time perspective could affect happiness and its correlates.

Keywords: religiosity, orientation toward the present, hedonism, fatalism

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Religiosity and Orientation Toward the Present

This research aimed to clarify the relationship between religiosity and orientation toward the present (which could be hedonistic or fatalistic present) and to test the potential moderating role of certain sociodemographic characteristics. Religiosity has been more clearly related to past and future time perspectives, but when it comes to its connection with the present perspectives, there are still ongoing debates and opposing results. This research wanted to contribute to decreasing the ambiguity in this field and to search for potential moderators of this relationship.

Religiosity

Religiosity is a complex and hard-to-define concept, since it is often used as a synonym for other phenomena. Different disciplines express interest in researching religiosity in a different manner – psychologists often focus on devotion, holiness, and piety, while sociologists focus on church membership, church attendance, accepting beliefs, doctrines, and life within faith (Cardwell, 1980, as cited in Holdcroft, 2006).

Some authors defined religiosity through a large number of dimensions that are related to religious belief and involvement (Bergan & McConatha, 2001). Other studies (Chumbler, 1996; Ellison, 1991) pointed out the importance of a multidimensional approach that would include subjective, cognitive, behavioral, social, and cultural dimensions. Today, one of the most popular approaches is one that understands religiosity as a system of personal constructs, where main parameters are its centrality (the strength of the religious construct system's influence) and its content ("direction" of its influence; Huber & Huber, 2010).

The centrality parameter is used to define the position of the religious construct system within the ensemble of all construct systems in a specific personality (Huber et al., 2011). If the religious construct system is more centrally positioned, it will be activated more frequently and have more intensive influence on other personal construct systems, experience and behavior. The content parameter is used to define the direction of the influence of religious belief. Therefore, if a religious construct system is dominated by constructs of a forgiving and loving God, it would lead experience and behavior in a different direction than a religious construct system dominated by constructs of a punishing God. The influence of the specific religious contents on the individual's experience and behavior depends on the centrality of the individual's religious construct system (Huber & Huber, 2010).

Huber (2003, as cited in Huber & Huber, 2012) merged two most dominant models of religiosity at the time: Allport's intrinsic/extrinsic concept (Allport & Ross, 1967) and Glock's multidimensional approach (Glock & Stark, 1965), while adding Kelly's theory of personal constructs (Kelly, 1955), anchoring the phenomenological and constructivist idea of the personal perspective of the individual. In this framework where a person's experiences and behaviors depend on their construing

of reality, faith and religious beliefs represent one of the specific ways of construing reality. This way he separated Allport's motivational approach from its fixation to the specific theological schemes and connected it to multiple and complex spheres of human religious exploration (Huber, 2007). Huber's model includes one measure of religiosity that can be also divided into five dimensions: ideology (belief in the existence of immaterial, transcendent reality without the necessity of whole and deep knowledge in order to believe in it), intellect (religious knowledge and hermeneutic expertise, highlights the cognitive processes), experience (contact with the "ultimate reality", feeling of existence or participation in something bigger, holy, and divine), private practice (devotion to some sort of individual religious activity and rituals in private space, e.g., praying, meditating), and public practice (some sort of relationship with the religious community within a certain place for common religious rituals and activity; Huber & Huber, 2012).

Orientation toward the present – present time perspectives

The process of time flow might seem mysterious in a way that every state of the world exists and travels through the past, the present and the future. If we exclude others and our own consciousness, it is hard to realize why the present moment is so special and different than the past and the future but it is certain that without this distinction, time would resemble the universe, with no obvious flow and clear direction (Wang, 1995). This projection of subjective consciousness onto a physical world is affected by the observer's limited perspectives and it exists because of the inability to observe more than one tiny piece of the world. This is why there are many different local schemes of time and space, on an observational level, and there is no valid reason why one concept of time should be the correct one for the whole world (Wang, 1995).

There is a solid opinion that the ability to monitor and perceive time is a basic human function that is crucial when it comes to evolution of human cognition. "Mental time-travel" means that we can mentally project backwards in time and relive a certain event or forwards through time and experience something in advance. Both have similar phenomenological characteristics and activate similar parts of the brain (Suddendorf & Corballis, 2007).

One of the founders of the concept of the time perception is William James and he thought that the knowledge about some part of the time flow, past or future, is always intertwined with our knowledge of the present moment, in the form of an object's echo that has just passed or is yet to come (James, 1886). These retentions from the past gradually fade and are being replaced by the upcoming content from the future which gives consciousness continuity and flow that is essential for time perception (James, 1890, as cited in Hutchins, 1952). Time perception has a role in the selection and striving at certain social goals, but also affects emotions, motivation, and cognition. It could become a disposition and an individual difference that manifests as a bias toward the past, present or future. However, people use

different time orientations in different degrees and under different circumstances, even though each person is characterized by a dominant time perspective that is mostly used (Zimbardo & Boyd, 2015).

Time perspective is a situationally determined and relatively stable individual characteristic that is formed under the influence of cultural, religious, class and family factors and that is often unconscious (Fraisse, 1963, as cited in Zimbardo & Boyd, 2015; Zaleski, 1994, as cited in Zimbardo & Boyd, 2015). In Western society, orientation toward the future is considered desirable and is related to many positive consequences (higher socioeconomic status, academic achievement, less pleasure seeking and health risk behavior), while the dominant present orientation would be an opposite of that (Zimbardo & Boyd, 2015). Those who are present oriented enjoy the moment more and are dedicated to more realistic goals, therefore are less affected by the warnings that their current behavior could have negative consequences in the future (Keough et al., 1999).

There are two present time perspectives: the hedonistic present which demonstrates hedonistic attitudes toward time and life, relates to risk taking behavior, orientation toward the present satisfaction and little concerns about the consequences in the future, and the fatalistic present that demonstrates fatalistic, hopeless and helpless relation toward the future and life in general (Zimbardo & Boyd, 2015).

Connection between religiosity and time perspectives

Religion provides a clear existential frame that increases the feeling of order in one's life (Yalom, 1980) and has a self-regulating function, the same function that time perspectives have (McCullough & Willoughby, 2009; Milfont & Schwarzenthal, 2014). This leads to greater well-being and better coping with everyday life struggles (Stolarski & Matthews, 2016). This overlap suggests the connection between time perspectives and religiosity that increases the need for more thorough research.

Understanding and perceiving time in a certain manner can be different within different religions (Gallois, 2007, as cited in Łowicki et al., 2018). Generally speaking, religion can nurture vast time horizons (both past and future) because the teachings it transfers can direct the attention toward existential questions of the origins of the world, life, humanity, and the ultimate purpose of life (Łowicki et al., 2018). There is certain regularity within specific religions, i.e., Protestants value work ethics and are goal-oriented and focus toward the future (Murrell & Mингrone, 1994), while Buddhists focus on the present moment, which is the main goal and value in life (Wegela, 2010).

If the dominant time perspective is perceived as an individual difference, it could be assumed that they affect a person's religiosity. It is suggested that increased present-hedonistic focus, combined with insignificant recalling of the past and little care for the consequences in the future, could aggravate the development of religious thinking and could restrict religiosity on the instrumental use of religion. At the same time, far-reaching into the past or future can provide the needed space for

questioning main life mysteries, including the ones about the world, the nature of God and the human nature. Therefore, the connection between time perspectives and religiosity could be reciprocal, because both concepts have the potential to affect the other by nurturing specific cognitive, complex considerations of the world that we live in (Łowicki et al., 2018).

Previous research

In some previous research, religiosity has been more clearly related to past and future time perspectives, while its connection with present time perspectives remains vague and open to discussion. One research study on the Brazilian sample has shown negative correlation between general religiosity and present-hedonistic time perspective (Milfont et al., 2008), while other research has shown positive correlation between hedonistic present and extrinsic religiosity (Przepiorka & Sobol-Kwapinska, 2018). This time perspective has turned out to be more complex than it is originally thought, since it contains items like: "*I try to live my life as fully as possible, one day at a time*", which does not implicate negative consequences in the future, unlike the item: "*I do things impulsively*". Whether a hedonistic present will be maladaptive or not, depends on the way it is guided by the concerns for the future. It is correlated with the feeling of happiness, positive affect, and greater life energy, but also with more aggressive behavior and tendency toward depression (Zimbardo & Boyd, 2015). These contradictory results suggest that this time perspective "uses" a double path while influencing happiness and its correlates (Cunningham et al., 2014), and a similar relationship is also expected when it comes to other constructs that are related to subjective well-being, such as religiosity (Tay et al., 2014; Villani et al., 2019).

However, religiosity can seem fatalistic since it assumes the existence of external forces that affect the physical world (Jacobson, 1999), but it could also lead to a greater sense of control and could serve as a source of hope in the situations of the existential insecurity, such as serious illness (Sadati et al., 2015). With all this, it is difficult to accurately predict the nature of correlation between the fatalistic present and different aspects of religiosity, although some previous research suggests positive correlation between both present time perspectives and extrinsic religiosity (Łowicki et al., 2018). Some other research showed that the fatalistic present positively correlates with both extrinsic and intrinsic religiosity (Przepiorka & Sobol-Kwapinska, 2018).

When it comes to certain socio-demographic characteristics, previous research has shown that age and educational level correlate with present time perspectives and religiosity. Older participants seemed less hedonistically oriented toward the present (Laureiro-Martinez et al., 2017), and highly religious participants showed the increase of their religiosity with age, while less religious demonstrated decrease of religiosity with age (Hunsberger, 1985). When it comes to the educational level, research has shown small but significant negative correlation with religiosity that can be amplified in certain cultures (Meisenberg et al., 2012). Also, lower educational

level is positively correlated with both fatalistic and hedonistic present (Guthrie et al., 2009; Sircova et al., 2015).

This research aims to explore the correlation and relationship between religiosity and orientation toward the present (hedonistic and fatalistic), but also to investigate certain socio-demographic variables as potential moderators in the relation of these two concepts. Possible prediction of the fatalistic and hedonistic present will also be tested, using religiosity as a predictor and gender as a control variable (included in the first block of the hierarchical regression analysis) since some previous research studies have shown that there are certain gender differences regarding religiosity (Beit-Hallahmi, 2003; Loewenthal et al., 2002) and orientation toward the present (Greene & Wheatley, 1992; Mello & Worrell, 2006; Trommsdorff, 1983; Zimbardo et al., 1997).

Method

Sample and procedure

The convenience sample method is used to recruit the participants, who filled out an online survey. The sample consisted of 648 participants, aged 18-70 years ($M = 35.50$, $SD = 11.30$), both male ($n = 195$) and female ($n = 453$). In this research, age is treated as a continuous variable. When it comes to educational level, there are six categories: most of the participants have a high school degree ($n = 223$), a Bachelor's degree ($n = 189$) and a Master's degree ($n = 129$), but there are also participants that have a first-level degree obtained on completion of a two- to three-year course ($n = 73$), participants that have a PhD degree ($n = 26$) and participants who have only a primary school degree ($n = 8$). The sample structure regarding religiosity is shown in the following table.

Table 1

Level of religiosity based on the results on the CRS-15 questionnaire and self-assessment of religious belonging to a certain category

<i>I'm an Atheist</i>	Total	Percent	<i>I'm an Orthodox Christian</i>	Total	Percent
	193	29.8		455	70.2
<i>Categories of religiosity</i>	<i>Number of participants</i>	<i>Percent</i>	<i>Average age</i>		
Nonreligious	266	41.1		38.93	
Moderately religious	299	46.1		33.91	
Extremely religious	83	12.8		29.40	

When asked how they identify themselves concerning the religious belonging, there were 29.8% of the participants that identified as atheists, claiming that they do not belong to any kind of religion and do not believe in the existence of God or something divine ($n = 193$), while 70.2% of the participants identified as Orthodox Christians ($n = 458$).

Level of participants' religiosity was measured by the CRS-15 scale, where all the participants whose average results varied in a range from 1 to 2 were considered nonreligious; the participants whose average results varied in a range from 2.06 to 3.94 were considered religious and the participants whose average results varied in a range from 4 to 5 were considered extremely religious. This categorization was applied due to the suggestion of the authors of the scale (Huber & Huber, 2012). The results show that there are 41.1% of the participants that are nonreligious ($n = 266$), 46.1% of the participants who are religious, which refers to moderate religiosity ($n = 299$), while 12.8% of the participants turned out to be extremely religious ($n = 83$).

For calculating the moderation effects of age and education level, Hayes Process Macro v4.0 was used, as a SPSS extension (Hayes, 2017).

Instruments

The Centrality of Religiosity Scale (CRS-15; Huber & Huber, 2012) was used to measure religiosity. This scale consists of 15 items organized in 5 subscales, where each subscale consists of three items. The items represent prominence or frequency of certain religious attitudes, experiences, and behavior, where participants respond on a 5-point (1 - never/not at all, 5 - very often/very much so) and 7-point Likert type scale (1 - never, 7 - several times a day/more than once a week). By recommendation from the authors, all scales are then translated into 5-point scales (Huber & Huber, 2012). The 5 subscales are: *Intellect* – includes items like: “*How often do you think about religious issues?*”; *Ideology* – includes items like: “*To what extent do you believe that God or something divine exists?*”; *Experience* – includes items like: “*How often do you experience situations in which you have the feeling that God or something divine wants to show or reveal something to you?*”; *Private practice* – includes items like: “*How often do you take part in religious services?*” and *Public practice* – includes items like: “*How often do you pray?*”. Using these subscales, a central, core dimension can be constructed, and it measures prominence of the religious construct system in the group of all individual constructs. All subscales have demonstrated adequate reliability, with Cronbach-alpha coefficient from .85 to .93, while the central dimension that includes all other subscales have Cronbach-alpha coefficient of .95. The CRS-15 was translated by the author of this research and the method used in the process was backtranslation. In this research, religiosity is treated like a one-dimensional concept, merging the existing categories into a central dimension that is represented as a continuous variable.

Zimbardo Time Perspective Inventory (ZTPI; Zimbardo & Boyd, 2015) was used to measure present time perspectives. Initially, this inventory contains 52 items organized in 5 subscales, but in this research only 20 items organized in 2 subscales are used. Participants responded on a 5-point Likert type scale (1 - very untrue, 5 - very true). The subscales that were used are: **Present-hedonistic** ($\alpha = .79$) which includes items like: “*When listening to my favorite music, I often lose all track of time*”, and **Present-fatalistic** ($\alpha = .70$) which includes items like: “*Since whatever*

will be will be, it doesn't really matter what I do". This scale is translated and adapted on a Serbian sample by Kostić and Nedeljković (2013; as cited in Mladenov, 2015). Both present perspectives are continuous variables.

Results

The results of the descriptive statistics for centrality of religiosity and orientations toward the present (hedonistic and fatalistic) are presented in Table 2.

Table 2

Descriptive statistics for main variables in this research

Research variables	Min	Max	M	SD	Skewness	Kurtosis	α
Centrality of religiosity	1.00	5.00	2.53	1.07	0.39	-0.99	.95
Hedonistic present	1.00	5.00	3.32	0.54	0.13	-0.12	.79
Fatalistic present	1.00	5.00	2.03	0.81	0.75	0.27	.70

Correlations between all the main variables in this research are presented in Table 3.

Table 3

Pearson correlation coefficient between the main variables

	1	2	3	4	5
1	-				
2	.13**	-			
3	-.28**	-.20**	-		
4	-.06	-.16**	.19**	-	
5	.05	-.24**	.36**	.27**	-

Note. 1 = Age, 2 = Education, 3 = Centrality of religiosity, 2 = Hedonistic present, 3 = Fatalistic present; **correlation is statistically significant at the level $p < .01$

Correlation analysis has shown that age is in significant and low correlation with educational level (positively correlated) and with centrality of religiosity (negatively correlated). However, educational level correlates significantly and negatively with religiosity, hedonistic and fatalistic present.

Religiosity correlates significantly and positively with both present orientations, with low to moderate intensity. Lastly, dimensions of present orientation positively and significantly correlate with each other.

Religiosity and Orientation Toward the Present

Table 4

Prediction model of hedonistic present

Block	Predictors	β	p	Model
1	Gender	.05	.196	$R = .05, R^2 = .00, R^2(\text{adj}) = .00, F(1, 646) = 1.67, p = .196$
2	Gender	.07	.060	$R = .20, R^2 = .04, R^2(\text{adj}) = .03, F(2, 645) = 13.91, p = .000, F_{\text{change}}(1, 645) = 26.08, p = .000$
	Religiosity	.20	.000	

The first model is not significant, but the model contribution and the second model are. The second model explains 4.1% of the variance of the hedonistic present, with religiosity as a significant predictor.

Table 5

Prediction model of fatalistic present

Block	Predictors	β	p	Model
1	Gender	.07	.099	$R = .06, R^2 = .00, R^2(\text{adj}) = .00, F(1, 646) = 2.72, p = .099$
2	Gender	.10	.003	$R = .38, R^2 = .14, R^2(\text{adj}) = .14, F(2, 645) = 55.48, p = .000, F_{\text{change}}(1, 645) = 107.79, p = .000$
	Religiosity	.38	.000	

The first model is not statistically significant, but the model contribution and the second model are, which explains 14.7% of the variance of the fatalistic present, with both gender and religiosity as significant predictors.

Furthermore, the moderator effects of the sociodemographic variables (age, educational level) on the relationship between religiosity and hedonistic and fatalistic present have been tested.

Table 6

Moderator effect of educational level on the relationship between religiosity and hedonistic present

Variable	Coefficient of moderation	Standard error	t	p
Education	-0.05	0.02	-3.20	.001
Religiosity	0.09	0.02	4.33	.000
Education*Religiosity	0.02	0.02	1.42	.156

The results suggest that the educational level is not a significant moderator in the relationship between the religiosity and hedonistic present.

Table 7

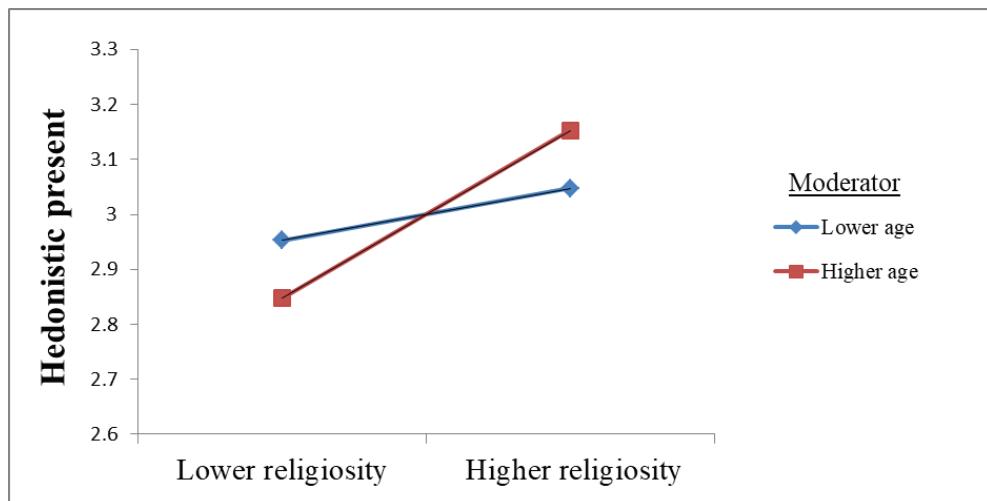
Moderator effect of age on the relationship between religiosity and hedonistic present

Variable	Coefficient of moderation	Standard error	t	p
Age	0.00	0.00	-0.12	.903
Religiosity	0.10	0.02	4.88	.000
Age*Religiosity	0.05	0.02	2.50	.012

It is shown that age significantly moderates the relationship between the religiosity and hedonistic present and it strengthens their positive correlation. This means that in older participants, the relationship with religiosity and hedonistic present is stronger while in younger participants the same relationship is weaker. These results are presented in the following graph.

Graph 1

Age (continuous variable) as a moderator in the relationship between religiosity and hedonistic present time perspective



In younger participants, the level of hedonistic present remains similar in both less and highly religious individuals, while in older participants the more religious ones are more hedonistically oriented toward the present.

In the next part of the results section, the moderator effects of educational level and age on the relationship between religiosity and fatalistic present orientation will be shown.

Table 8

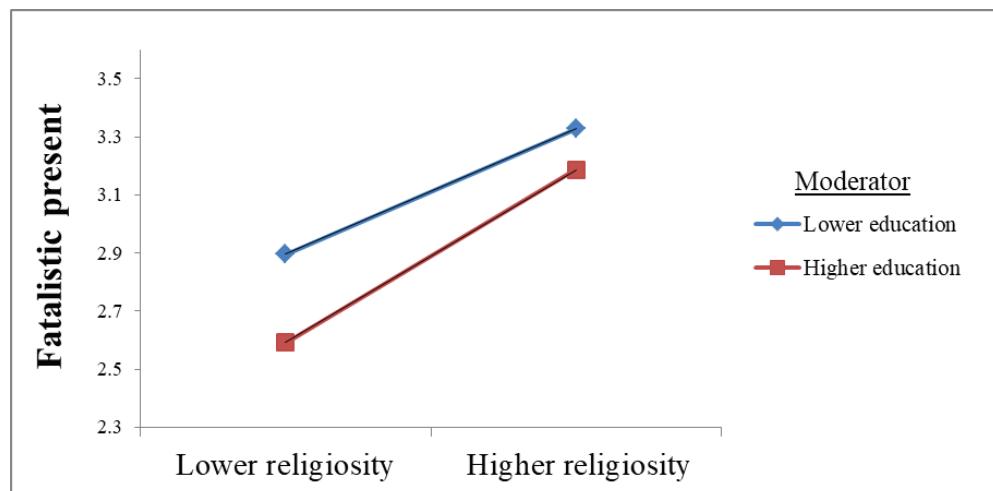
Moderator effect of educational level on the relationship between religiosity and fatalistic present

Variable	Coefficient of moderation	Standard error	t	P
Education	-0.11	0.02	-4.81	.000
Religiosity	0.26	0.03	9.23	.000
Education*Religiosity	0.04	0.02	1.97	.048

The results suggest that there is a significant moderation effect of education when it comes to the relationship between religiosity and fatalistic present orientation. The effect that the educational level has on this relationship is that it strengthens their already positive correlation which means that in more educated participants, the relationship between fatalistic present and religiosity is stronger while in less educated participants the same relationship is weaker. The results are also presented in Graph 2.

Graph 2

Educational level (categorical variable) as a moderator in the relationship between religiosity and fatalistic present time perspective



More religious participants with both lower and higher educational levels express similar results when it comes to orientation toward the fatalistic present. The difference between them in this orientation becomes greater when they are both low on religiosity. Participants with higher educational level and low religiosity express the lowest scores on this time perspective.

Lastly, the moderating effect of age in the relationship between religiosity and fatalistic present was also tested.

Table 9

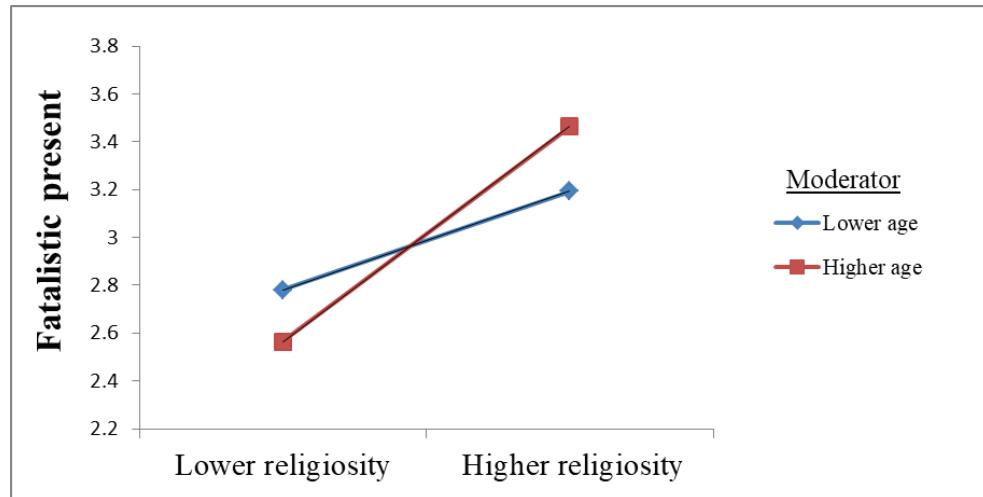
Moderator effect of age on the relationship between religiosity and fatalistic present

Variable	Coefficient of moderation	Standard error	t	p
Age	0.01	0.00	4.92	.000
Religiosity	0.33	0.03	11.62	.000
Age*Religiosity	0.12	0.03	4.22	.000

When it comes to the relationship between religiosity and fatalistic present orientation, it is shown that age significantly moderates it. The results are presented in the following graph.

Graph 3

Age (continuous variable) as a moderator in the relationship between religiosity and fatalistic present time perspective



Both older and younger participants with low religiosity express similar levels of fatalistic present orientation, but the increase in religiosity in older participants is followed by more drastic increase in fatalistic present. Older, more religious participants express greater orientation toward the fatalistic present. The results presented show that age strengthens an already positive correlation between religiosity and present fatalistic time perspective. This means that in older participants, the relationship with religiosity and fatalistic present is stronger while in younger participants the same relationship is weaker.

Discussion

The aim of this research was to examine and clarify the connection between religiosity and orientations toward the present, which is presented through hedonistic

or fatalistic present time perspective. The possibility of predicting these time perspectives based on religiosity and gender (as a control variable) was examined. When it comes to age and educational levels, their moderating roles in the relationship between religiosity and present time perspectives were also examined.

Most of the participants are religious (58.9% of the sample), while 41.1% of participants are nonreligious. Regardless of the results obtained with CRS-15 measure, 70.2% of participants identify themselves as Orthodox Christians, while the rest consider themselves as atheists. This suggests the difference between feelings of belonging to a certain religious group and being religious (in a manner of expressing ideological, experiential, cognitive and practical aspects of religiosity). This is not uncommon, since religious identification alone is related to lower levels of psychological distress, such as reduced depressive symptomatology (Koteskey et al., 1991; Ysseldyk et al., 2010), enhanced self-esteem (Talebi et al., 2009, as cited in Ysseldyk et al., 2010), and subjective well-being (Greenfield & Marks, 2007).

Religiosity expressed a tendency to decline with participants' age and educational levels, which is in accordance with some previous research. Most of the research suggest that as individuals age, they tend to become more religious (Krause, 2013; Moberg, 2005; Seifert, 2002; Wang et al., 2014) but some research shows that in highly religious people, religiosity used to increase with age, while in less religious it decreased as they got older (Hunsberger, 1985). The results obtained by Hunsberger could be used to explain the results in this research, since most of the participants were moderately religious or nonreligious (which suggests decrease in religiosity). However, since none of the research was longitudinal, precaution and further research on this matter is advised. Regarding the educational level, it was shown that in some previous research there was a negative correlation between religiosity and education (Meisenberg et al., 2012), but also between education and fatalistic and hedonistic present time perspectives (Guthrie et al., 2009; Sircova et al., 2015) and these results are replicated in this research.

Predictive model of hedonistic present was statistically significant, with religiosity as a positive significant predictor, which is in accordance with some previous findings where hedonistic present correlated positively with extrinsic religiosity (Przepiorka & Sobol-Kwapinska, 2018), but there were also some opposite results (Milfont et al., 2008). This research used the central dimension of religiosity which contains both intrinsic and extrinsic religiosity. These forms of religiosity are represented both through inner feelings of presence of something divine and holy (i.e., dimension of experience) and interest and knowledge about the religion and the need to present one's views (i.e., dimension of intellect) which some authors suggest is a form of instrumental usage of religion itself (Łowicki et al., 2018). Hedonistic present contains the need for novelty and sensation seeking behavior (Stolarski et al., 2015) and we can also assume that it refers to novelty in a form of religious experience, feeling of connection and unity with something divine and the need for new knowledge (religious). However, other research has found negative correlation between this time perspective with religiosity (Zimbardo & Boyd, 2015). Anyhow, the present hedonistic time perspective seems more complex than it was previously

thought, especially when we take into consideration the fact that this scale contains items that could be understood differently in regard to concerns about the future consequences, which was previously mentioned. This dimension correlates with happiness, positive affect and greater life energy, but also with more aggressive behavior and tendencies toward depression (Zimbardo & Boyd, 2015). These contradictory results suggest the existence of a double path by which hedonistic present orientation could affect happiness and its correlates (Cunningham et al., 2014), hence this kind of relationship could also be expected with religiosity.

Religiosity is a positive significant predictor of fatalistic present as well which is in accordance with previous results (Lowicki et al., 2018). This perspective relates to the belief that the future is predetermined and resistant to any kind of individual activity and that people are left to their own destiny (Zimbardo & Boyd, 2015). It seems logical that this time perspective is positively correlated with religiosity, which includes the experience and feeling of something divine, belief in the existence of immaterial, interest in religious subjects and both private practice and rituals within the religious community.

Lastly, it was shown that age is a significant moderator when it comes to the relationship between religiosity with both hedonistic and fatalistic present, amplifying their already positive correlation. In older participants, the relationship with religiosity and hedonistic present is stronger while in younger participants this relationship is weaker. As previously mentioned, this time perspective contains the need for novelty and sensation seeking (Stolarski et al., 2015) which could also mean religious experiences, religious knowledge, and feeling of connection to something divine. Given that religiosity rises with age in already highly religious individuals (Hunsberger, 1985), these results could suggest greater presence in the present moment simultaneously with the rise of the interest for religious experience and knowledge later in life.

In the case of the fatalistic present, both older and younger participants with low religiosity express similar levels, but the increase of religiosity in older participants is followed by more drastic orientation toward the fatalistic present. Some previous research results are in accordance with this finding and show positive correlation between fatalistic present and age (Chen et al., 2016), even though this direct correlation is not replicated in this research. Nevertheless, religiosity was found to positively correlate with the fatalistic present and it was shown that in older participants, this relationship is stronger.

Educational levels show significant moderating effects only in the relationship between religiosity and fatalistic present. It was shown that in more educated participants, the relationship between fatalistic present and religiosity is stronger while in less educated participants the same relationship is weaker. Some previous research studies have shown negative correlation between religiosity and educational levels (Meisenberg et al., 2012) and negative correlation between educational levels and fatalistic present time perspective (Guthrie et al., 2009; Sircova et al., 2015). These results could explain the ones obtained in this research which suggest the more drastic increase of fatalistic present in more educated participants which is accompanied by the increase of the religiosity in the individual.

Conclusion

This research aimed to explore the connection between present orientations and religiosity and succeeded in the attempt to explore these relationships and what might influence them. Religiosity was found to significantly predict both time perspectives, suggesting that hedonistic present orientation needs to be revised, since it can influence an individual's well-being in more than one way, as originally thought. Proposed moderators (age and educational level) were found to significantly moderate the relationship between religiosity and orientations toward the present, strengthening their positive relationship.

One of the suggestions for some future research involves including more different variables in the prediction model, since these models explained low percentage of variance of the criterion variables, even though they were statistically significant. This implies that the models should be complemented with more constructs. Moreover, other variables should be considered as moderators (e.g., gender) or mediators (e.g., subjective well-being) if the goal is to reach a deeper understanding of religiosity and its influence on individuals.

Research should also be careful whether the used instruments are adapted in the specific culture that they are applied to, which religion is dominant in the questioned culture and which characteristics of the dominant religion could be relevant for the research. Time perspective measurement and the formulation of certain items should be revised in future research. Also, validity and reliability of the religiosity scale should be tested in the future. Even though it showed good characteristics and results in this culture, this is the first time that this scale is applied in Serbian language.

Lastly, certain characteristics of the culture where the research is conducted that could be related to the orientation toward the present should also be considered. For example, the territory that this research was conducted on was inflicted with bombing and wars in the recent past (20-30 years ago). Also, this area is one of the former communist countries and the revitalization of religion is often experienced in such countries (Voicu & Constantin, 2012), so this should also be considered when addressing the problem since there are certain findings that suggest that this is also the case with Serbia (Radisavljević Ćiparizović & Vuković, 2020). It would be useful to take all these factors into account and direct some future research in that direction.

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Religioznost i orijentacija ka sadašnjosti

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Apstrakt

Cilj ovog istraživanja bio je ispitati da li je religioznost povezana sa orijentacijama ka sadašnjosti, da li može statistički značajno da ih predviđa i da li i na koji način uzrast i stepen obrazovanja ispitanika moderira ove odnose. Za prikupljanje podataka korišćena je Skala centralnosti religioznosti (CRS-15), Zimbardova skala vremenskih perspektiva (ZTP) i upitnik koji je sadržao pitanja o sociodemografskim podacima kako bi se prikupile osnovne deskriptivne informacije o uzorku. Uzorak je činilo 648 ispitanika ženskog ($n = 453$) i muškog pola ($n = 195$), uzrasta od 18 do 70 godina ($M = 35.50$, $SD = 11.30$).

Oba prediktorska modela u istraživanju su značajna. Prvi značajni model objašnjava 4,1% varijanse hedonističke sadašnjosti ($R^2 = .04$, $F_{(2, 645)} = 13.90$, $p < .001$) sa religioznošću ($\beta = .20$, $p < .001$) kao statistički značajnim prediktorom. Drugi model objašnjava 14,7% varijanse fatalističke sadašnjosti ($R^2 = .14$, $F_{(2, 645)} = 55.48$, $p < .001$), sa polom ($\beta = .11$, $p < .01$) i religioznošću ($\beta = .38$, $p < .001$) kao statistički značajnim prediktorima. Rezultati su pokazali da postoji moderatorski efekat uzrasta na odnos religioznosti i orientacija ka sadašnjosti, a efekat je takav da pojačava njihovu pozitivnu povezanost. Kada je u pitanju obrazovanje, ono ostvaruje moderatorski efekat samo na odnos između religioznosti i hedonističke sadašnjosti, pri čemu takođe pojačava njihovu pozitivnu povezanost. Rezultati ukazuju na to da bi koncept hedonističke sadašnjosti trebalo dodatno preispitati s obzirom da njene maladaptivne osobine proizilaze iz toga koliko je vođena zabrinutošću za budućnost, a neka prethodna istraživanja sugeriraju dvostruki put kojim ova vremenska perspektiva može delovati na sreću i njene korelate.

Ključne reči: religioznost, orientacija ka sadašnjosti, hedonizam, fatalizam

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Identity Status and Anxiety in Artistically Gifted Adolescents and Grammar School Students^{1*}

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Abstract

During adolescence, a young person often faces various developmental crises, increased anxiety, as well as a fluctuating experience of their own identity. Adolescents, as a very heterogeneous group, are nevertheless connected by similar crises they go through, and often by the insecurity of their own identity. The aim of this paper is to examine the relationship between anxiety and identity status in two groups of high school students – artistically gifted students and grammar school students, as well as to examine the differences between these groups in terms of analyzed characteristics. The sample was convenient and consisted of 173 respondents ($n_{\text{male}} = 45$, $n_{\text{female}} = 128$), aged 16 to 18 years ($M = 16.70$, $SD = 1.06$). A total of 49.7 percent of the respondents attend secondary art schools, while the remaining respondents (50.3%) are grammar school students. The Modified Marcia Identity Questionnaire and the Anxiety Inventory Form – Y were used in this research. The results show that art school students achieve significantly higher scores than grammar school students on the anxiety dimension ($t(171) = 4.92$; $p < 0.05$) and lower values on the identity foreclosure dimension ($t(171) = -3.01$; $p < .05$). Anxiety and identity statuses diffusion and moratorium correlate in both groups of respondents. In grammar school students, identity foreclosure correlates with identity diffusion. It can be concluded that grammar school students who achieve higher scores on identity status, identity foreclosure, avoid the unpleasant state of anxiety and thus search less for answers related to their identity and values. However, although they thereby reduce the experience of anxiety, their identity still remains somewhat vague and diffused.

Keywords: identity, identity status, anxiety, adolescence

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Identity Status and Anxiety in Artistically Gifted Adolescents and Grammar School Students

Human psychosocial development is a central topic of developmental psychology. For a long time, the emphasis was placed on early childhood, but since the middle of the twentieth century, interest in adolescence has been growing. Some theoretical assumptions about the characteristics of adolescent development have remained entrenched to this day. For example, adolescence was generally discussed as a period in which key changes occur on the biological, psychological and social level, which then shape the entire functioning of a young person, and which are very turbulent (Kapor Stanulović, 2007, Lackovic-Grin, 2006). There is no single agreement in the literature about the duration of this period. At the beginning of adolescence, developmental psychologists take the physiological changes that occur during puberty, for example, from the age of 12 (Erikson, 1956), or 13, while the end of this developmental phase is more difficult to determine. It can last up to 21, or even up to the age of 25 (Steinberg, 2017), depending on when some developmental tasks typical for this period are realized. Contemporary developmental theories seek to supplement the classical understanding of adolescence as a period of "turbulence" and to see this period in a new light. As Arnett (1999) states, viewing adolescence as a period of storm and stress is not enough; even in the midst of the storm, many adolescents enjoy numerous aspects of their lives, they are satisfied with a large number of their relationships most of the time, and have a positive outlook on the future. The particular merit of the mentioned author is that he introduced the emerging adulthood phase, which is distinguished by specific characteristics such as, for example, a moratorium as an identity status, increased anxiety and depression, a tendency to change professional choices and frequent cohabitation with partners, but delaying parenthood. Predominantly, according to him, adolescence lasts until the age of 18, 19, and this emerging adulthood phase continues after it.

The developmental tasks of adolescence are numerous. Young people fit into a group of peers, differentiate themselves from their family, make their professional choices, decide on gender roles and form their personal identity (Kapor Stanulovic, 2007; Lacković-Grin, 1994, 2006).

Identity status

A pioneer in identity research, Erik Erikson, defines the term identity as the experience of the essential sameness and continuity of the *self* over a longer period of time, regardless of its changes in different periods and circumstances (Erikson, 2008). He adds that this feeling is rarely extremely conscious, as for example in periods of an impending identity crisis when there is a danger of escalation (Erikson, 2008). Erikson, using the described concept of identity, talks about personality development, which he describes through eight stages. The fifth stage of development

is particularly important, because it is the stage in which the identity of a young person is formed. Erikson also talks about identity through two concepts, the ego-identity and the diffusion of ego-identity, which represent the outcomes of the assumed psychosocial crisis that takes place in the period of adolescence. He believes that during that time a person goes through a phase of an ever-increasing dedication to professional activities and ideologies, facing adult tasks, such as employment, while at the same time trying to synthesize their childhood identifications in such a way as to achieve a reciprocal relationship with the society and maintain the continuity of personal identity (Erikson, 1956, 1963).

Since the beginning of empirical research based on Erikson's concepts, James E. Marcia's approach has dominated the field (Bosma & Saskia Kunnen, 2001). He expanded Erikson's concepts of identity crisis and diffusion. Using semi-structured interview techniques and projective techniques of the incomplete sentences type, Marcia (1966) compiled the so-called bipolar model of identity status. The diffusion of identity is at one pole, whereas the achieved identity is at the other. On this continuum, two more points of concentration of results were found, roughly equidistant from each other, and those are the identity moratorium and the identity foreclosure. This model was created on the basis of work with the adolescent population, and it mainly refers to the developmental crisis of this age (Marcia, 1966).

Expanding on Erikson's theory, Marcia came up with four types of Ego identity status in the psychological development of identity. The basic idea is that the notion of identity is defined through two concepts, the commitment and the choices that a young person makes in terms of personal and social aspects. In his work, Marcia (1966, 1980) gives descriptions of persons in whom certain identity statuses are dominant:

1. Identity Achievement – In relation to Erikson's criteria, this identity status represents a person who resolutely, that is, decisively sticks to their choices when it comes to occupation and ideological framework. During their development, they researched the offered alternatives, reevaluated their views and then stuck to the conclusions reached. The resolution of the crisis created by this reevaluation leaves a person with an achieved identity free to act in the social environment. Generally speaking, it could be said that the sudden changes in life circumstances that are characteristic of the adolescent life period, and also for people of all ages in today's time of post-industrial capitalism, should not represent insurmountable obstacles for this person who is ready to react to them with firm conviction and a necessary dose of flexibility.

2. Identity Diffusion – The basic characteristic of this identity is the lack of decisiveness, that is, resolution. The person may have gone through a period of crisis, although this is not a necessary prerequisite. When stating one's interests, when it comes to occupation, one gets the impression that the person has absolutely no idea what to do with him/herself and in which direction to go. If the person does state an interest, it is so weakly substantiated that it seems that he/she will replace it with something else at the next opportunity. In relation to their ideological framework,

they are either absolutely uninterested or take a little bit of everything depending on the current situation. This person, in principle, is comfortable with any point of view and has no reluctance to try any other political or religious directions.

3. Identity Moratorium – People with this identity status are in a state of ideological crisis, whether it is related to the choice of profession or the philosophical-political prism through which the person views the world, and they lack resolution/decisiveness. What primarily distinguishes them from people with identity confusion is the active struggle to reach a state of resolution. These individuals try to find a way to resolve the conflict between their parents' wishes, social pressures and their own affections in the best possible way and are absolutely preoccupied with this inner turmoil. They can often seem confused and lost, which is a result of the fact that this internal struggle can seem insoluble.

4. Identity Foreclosure – It is characterized by the fact that a crisis was not experienced during development, i.e., diffusion and a period of research, but people in this status are very dedicated. With these people, it is difficult to discern where their parents' ideological framework ends and their own begins. The parent's value system is taken on uncritically without seeking to submit it to criticism or to experience alternative value systems. These people have been directed to a certain life path since childhood, and education only serves to confirm their acquired beliefs. Such persons would feel very threatened if they found themselves in situations where their value system did not prove to be functional (Rokvić, 2017).

In accordance with Erikson's original theory, we can say that identity represents a category that changes over time, that is, it changes its quality by going through developmental crises. Longitudinal research was carried out with the aim of showing the development of identity status over time, which led to some interesting conclusions. The model of personality development that James Marcia came up with in his research could be called MAMA (*moratorium, achievement, moratorium, achievement*), where a person goes through consecutive stages of achieved identity. In fact, the MAMA model refers to the period in which the adolescent alternately passes from the moratorium phase to the achieved phase in order to eventually reach a more mature form of identity, i.e., an achieved identity. This means that young people are in a state of crisis in which they actively search for solutions (moratorium), after which they come to a decision, which they then incorporate into the image of their identity (achieved identity), and this cycle repeats itself until it remains in a more mature form of identity. Although they choose a certain identity, new information and experiences can briefly take the adolescent to the previous stage of the Moratorium. Marcia also states that this model can be applied not only to adolescence, but also to more mature stages of the life cycle (Stephen, et al., 1992).

Depending on the dynamic development, that is, in which direction the further development of the personality will go, the identity foreclosure can be *firm* and *developmental*. While a firm identity foreclosure represents a stable path in accordance with the norms adopted from the family, that is, the environment, a developmental identity foreclosure represents a stepping stone to more mature identity statuses (Kroger, 1996).

Identity status is a factor that affects all aspects of personality and, therefore, it can be assumed that it also affects certain measurable dimensions of personality. Following the formation of his model, Marcia (1996) started to investigate the relationship between identity statuses by postulating that identity moratorium represents a state of greatest anxiety. He believed that exploring and coming into contact with experiences that have the potential to define and change the course of the rest of one's life are stressful circumstances. For this reason, he expects that the level of generalized anxiety is highest in the identity moratorium phase. However, people with identity foreclosure, having in mind that they have accepted their life path on which they confidently stride, should show the lowest level of anxiety. In their research related to the relationship between identity statuses according to Marcia's model and anxiety, Lillevoll and colleagues (Lillevoll et al., 2013) came to the conclusion that identity foreclosure in most cases represents a state with the lowest level of anxiety, except in relation to the achieved identity in women, while anxiety levels in women with an achieved identity are significantly lower than in men. Identity achievement also goes with lower levels of anxiety than identity confusion, but there are no differences between genders.

The development of identity cannot be viewed separately from the cultural context in which it takes place. The very cultural background of psychosocial development, which changes over time, also has consequences for personality development. The historical and social context determines the quality, acceptability and adaptive success of different identity statuses (Bosma & Saskia Kunnen, 2001). Social upheavals, transition to post-industrial capitalism, change of gender roles in society also leave their mark on one's individual development. Marcia himself (Marcia, 1996) lists differences in the correlations and meanings of identity status among females before 1977 and in later research studies. While in the case of male respondents in earlier studies, foreclosed identity correlated with negative indicators of adaptability, this connection did not exist in the case of women. However, in recent studies, this correlation also appears in female respondents, which Marcia explains by the growing influence of feminist philosophy (Rokvić, 2017).

The findings of various studies (Arnett, 1999; Compas et al., 1995; Larson et al., 1996; Moffit, 1993; Petersen et al., 1993; Rutter, 1986; Scaramella et al., 1999) indicate that the increase of stress in adolescence (puberty changes, academic and peer pressure) is at least partly responsible for the increased rate of psychological disorders in this period, such as depression, behavioral disorders, and substance abuse. The increased demands of modern society regarding the level of education, desirable standards in work on the one hand, and frequent family problems on the other hand prolong the dependence on parents, thus delaying the completion of identity formation, as well as prolonging uncertainty and anxiety.

It is also important to mention the research on a sample of students (Rokvić, 2017) about the connection between the identity status and personality dimensions according to Van Kampen's 4DPT model. The 4DPT model was created as a critique of Eysenck's factor theory of personality and contains 4 dimensions – extraversion, neuroticism, insensitivity, orderliness; while the well-known Eysenck personality

model contains the dimension P (Psychoticism). In Van Kampen's model, instead of that dimension, we have two subdimensions – insensitivity and orderliness. Neuroticism, as an important factor in these personality models, is defined as a tendency to experience negative feelings such as: anxiety, irritability, anger (Van Kampen, 1997). According to the results of the mentioned research, there is a moderate positive association of the dimension of neuroticism with moratorium and identity confusion, which based on the obtained results can indicate a connection between anxiety and unclear identity status.

Anxiety

The word “anxious” comes from the Latin “anxious”. In our country, it is taken from the English language, and the literal translation from English means to be worried, to be upset, to be afraid (Trebješanin, 2018).

Freud (1912) was the first to describe anxiety as “free-floating”. Freud formulated the first theory of anxiety in his discussion of libido. Anxiety is the result of an undischarged libido. Anxiety appears as a signal that warns the Ego that there is a danger of content penetrating from the unconscious, which triggers it to implement various defense mechanisms. In this sense, anxiety is a reaction to internal contents, at the same time a signal to the Ego and a manifestation of its weakness, because censorship and suppression failed to keep the contents in the unconscious (Freud, 1946). There is no real danger, but the developing organism has encountered dangers that are now warning it, and which originate from feelings of helplessness (Hartmann, 1958). In this paper, we will look at the more recent theory of anxiety given by Spielberger.

In his theory, Spielberger (1966) views anxiety as a state and as a trait. When anxiety is viewed as a state, it is situational anxiety, which involves how a person is feeling at the moment. When anxiety is viewed as a trait, it is general anxiety, which refers to how a person generally feels (Spielberger, 1966). By distinguishing the trait and state of anxiety, a distinction was made between anxiety as a stable disposition and as a transient emotional state that almost every person has in their experience. The state of anxiety is defined as an unpleasant emotional response when facing threatening demands or dangers (Spielberger et al., 1983), and the cognitive evaluation of the threat is a prerequisite for experiencing this emotion (Lazarus, 1991).

Spielberger et al. (1983) described trait anxiety as a general disposition to experience transient states of anxiety. People with a highly expressed trait anxiety may have a more frequent and intense experience (state) of anxiety compared to people with a low expressed trait, but they are not anxious all the time (Spielberger et al., 1983). Anxiety is not a pleasant condition at all, especially when a person is young and is additionally confused and frightened by these conditions. Anxiety occurs when a person assesses that his entire life situation exceeds his capabilities, that is, when he assesses that he is unable to cope with life's difficulties (Marić,

2005). It often happens with young people. The tension at school and among peers is high. Confirming and preserving the self-image is not easy, especially if the identity is not formed, and anxiety in different contexts threatens to overwhelm the young person.

Vidanović and Andelković's (2006) research on a sample of artistically and musically gifted adolescents and grammar school students, with regard to differences in the level of Ego development, experience of the body and defensive functioning, as well as situational and general anxiety, showed that there are no differences in the stage of Ego development between musically and artistically gifted adolescents and grammar school students. One of the assumptions used in this research was that a higher stage of Ego development implies more effective and mature strategies for overcoming stress and anxiety. Taking into account the information from the same research that there was a negative correlation between the reached stage of Ego development and general anxiety in male grammar school students, which was not the case in the gifted ones, we can talk about a greater tolerance to anxiety in already actualized creative people. In the light of theoretical assumptions (Barron, 1963, Smith & Carlsson, 1990, according to Vidanović and Andelković, 2006), the authors describe gifted and creative adolescents as generally more tolerant to high levels of anxiety. In studies of adolescence as a specific stage, we can single out the research of Vidanović and Stojiljković (2014), which examines and tests the assessment of creativity and the attitude of respondents toward art on a sample of adolescents (grammar school students). The authors tried to verify the views of those authors who described the personality of a creative person as original, independent, ready to take risks, open to experiences, as well as interested in the field of art. The results that were obtained support the fact that there are differences in the degree of expression of general creativity between grammar school students who are engaged in art and those who are not interested in art.

Since the identity status of adolescents is an important issue for research psychologists and professional associates, especially considering the changes that occur due to extended schooling, unclear identity, delay of employment, as well as delay in starting marriage and family, ("emerging adulthood," Arnett, 1999), which are associated with more pronounced anxiety and depression, the subject of this research was the examination of the relationship between identity status and the level of anxiety in grammar school and art high school students. Art school students usually base their choice on clearly recognized talents and opportunities. The very choice of school points to a future profession, so we assumed that the important issue of identity, professional choice, was resolved earlier in relation to grammar school students. These are the reasons why we wanted to examine the differences between grammar school students and art high school students regarding the expression of identity status and anxiety. Students were compared in regard to anxiety as a trait.

Method

Research subject and objectives

The subject of the research is the relationship between anxiety and identity status in the population of artistically gifted students and grammar school students.

The objectives of the research are:

- to determine whether there is a difference in the degree of anxiety and dimensions of identity between art school students and grammar school students,
- to determine whether there is a relationship between anxiety and identity dimensions in these two subsamples of students.

Research sample

The sample was appropriate and consisted of 173 grammar school and secondary art school students, aged 16 to 18. There were 45 male respondents (26%) while 128 respondents were female (74%). A total of 86 art high school students (49.7%) and 87 grammar school students (50.3%) participated in the research; 30 (17.34%) respondents lived with one parent, 104 (60.12%) of them lived with both parents, while 39 (22.54%) respondents lived with their extended family.

The procedure

The research was carried out in secondary art schools in Niš ($n = 31$ students) and Belgrade ($n = 55$ students) and in a grammar school in Kruševac ($n = 87$ students). Before starting to fill out the questionnaire, the respondents were informed in writing that the research was anonymous and that the data would be used exclusively for research purposes, and that, accordingly, parental consent had been previously obtained.

Research instruments

The research used the **Modified Marcia Identity Questionnaire** (Akers et al., 1998), which is actually a modified version of two older instruments for assessing the Ego-identity status (Bannion & Adams, 1986; Marcia, 1966).

The reason for using this version is that the Extended Version of the Objective Measure of Ego-identity Status has 64 items and is very long, and that the modified 40-item version had similar reliability to the Extended Version of the Objective Measure of Ego-identity Status which was determined in a survey of 2000 adolescents

in Arizona: .61 to .73 (median = .67) (Bannion & Adams, 1986). Also, in Akers' research, Cronbach's alpha for the identity subscales of the Modified Marcia Identity Questionnaire was significantly higher (range .71 to .79; median = .76).

The questionnaire consists of 40 items, and each item corresponds to one of the 4 scales that represent the types of identity status. On a Likert scale from 1 to 5, respondents state how much they agree with a given statement. Each of the respondents receives scores on all four dimensions of identity, that is, identity status is treated as a continuous and not a categorical variable. The reliability of the scales in our sample ranges from .60 to .76 in the following manner – for achieved identity, $\alpha = .66$ (item example: *There are many reasons for making friends, but I choose my close friends according to certain values and similarities that I have personally decided upon*), for identity moratorium $\alpha = .61$ (item example: *I am still trying to decide how capable I am as a person and what job is right for me*), for identity foreclosure $\alpha = .76$ (item example: *I may have considered many different jobs, but all questions disappeared when my parents told me what they wanted*), and for identity diffusion $\alpha = .60$ (item example: *I still haven't chosen the job I want to do and I'm doing whatever is available until something better comes along*).

The anxiety scale as a personality trait (Spielberger, 1983; Anxiety Inventory Form – Y) was constructed based on Spielberger's understandings. Spielberger's questionnaire consists of two separate scales measuring situational anxiety and anxiety as a personality trait. In this research, the form of the scale that measures anxiety as a personality trait was used. Trait anxiety scale (Form Y-2) has 20 statements. The respondent's task was to circle one answer to each statement on a four-point scale about how he or she mostly feels. Examples of statements are: *I am nervous and anxious, I am happy, I am troubled by disturbing thoughts*. The total score is obtained by adding up the points for all questions. The lowest possible score on the questionnaire is 20, and the highest is 80. A higher score indicates a higher degree of anxiety. The reliability, obtained in our sample, is $\alpha = .74$.

Results

After processing the data collected using the mentioned questionnaires, the following results were obtained. Firstly, descriptive statistical measures will be presented.

Table 1

Descriptive statistical measures of anxiety and identity status among art school students and grammar school students

Subscale	Min.	Max.	M	SD	Sk	Ku
Anxiety	1.05	3.75	2.18	0.65	0.29	-0.90
Identity achievement	1.80	5.00	3.57	0.63	-0.30	0.02
Identity diffusion	1.10	4.30	2.66	0.60	0.19	-0.25

Subscale	Min.	Max.	<i>M</i>	<i>SD</i>	<i>Sk</i>	<i>Ku</i>
Identity moratorium	1.10	4.90	2.89	0.63	0.30	0.51
Identity foreclosure	1.00	4.40	1.94	0.65	0.79	0.43

Note. Sk – Skewness; ku – kurtosis

Values of skewness and kurtosis indicate the normal distribution of the examined variables.

In order to verify the existence of differences between secondary art school and grammar school students regarding the level of anxiety expression and identity status, the t-test was performed. The results of this analysis are presented in Table 2.

Table 2
The difference in the expression of anxiety and identity status with regard to the type of school

Variable	School	<i>N</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	η^2
Anxiety	art school students	86	48.12	12.97	4.92	.000	.12
	grammar school students	87	39.04	11.24			
Identity achievement	art school students	86	3.53	0.66	-0.84	.403	.004
	grammar school students	87	3.61	0.60			
Identity diffusion	art school students	86	2.65	0.56	-0.22	.829	.000
	grammar school students	87	2.67	0.64			
Identity moratorium	art school students	86	2.85	0.56	-0.77	.443	.003
	grammar school students	87	2.93	0.69			
Identity foreclosure	art school students	86	1.79	0.60	-3.01	.003	.05
	grammar school students	87	2.08	0.67			

The results of the t-test show that there was a statistically significant difference between art school students and grammar school students in terms of anxiety expression and identity status – identity foreclosure. Anxiety is more pronounced in the group of art school students, and based on the size of the effect (eta square), we can see that the difference between the groups is large. However, in the group of grammar school students, the assumed identity dimension is more pronounced, and the difference between the groups is of moderate intensity.

Table 3*Correlation of investigated variables on a sub-sample of art school students*

	1.	2.	3.	4.	5.
1. Anxiety	1				
2. Identity achievement	-.07	1			
3. Identity diffusion	.20	-.14	1		
4. Identity moratorium	.23**	.07	.26**	1	
5. Identity foreclosure	-.20	-.16	.14	.01	1

Note. ** The correlation is statistically significant at the $p < .05$ level

Anxiety has a significant positive low correlation with the identity moratorium. The identity diffusion is in a low but significant correlation with the moratorium.

Table 4*Correlation of investigated variables on a sub-sample of grammar school students*

	1.	2.	3.	4.	5.
1. Anxiety	1				
2. Identity achievement	-.21	1			
3. Identity diffusion	.20	-.10	1		
4. Identity moratorium	.30**	.14	.44**	1	
5. Identity foreclosure	-.08	-.14	.39**	.19	1

Note. **the correlation is statistically significant at the $p < .05$ level

Anxiety has a significant positive medium correlation with the identity moratorium status. The identity foreclosure has a significant positive mean correlation with the identity diffusion. Also, the identity diffusion and moratorium are positively and significantly correlated.

Discussion

Research on the adolescent period continues to be an inexhaustible source of information about the problems young people face during their development. This type of research enables us to better understand how a young person who is on the threshold of adulthood develops and changes. Contemporary developmental theories seek to supplement a widely accepted understanding that adolescence is a period of turbulence and to view this period in a new light. According to Arnett (1999), which we emphasized at the beginning of this paper, viewing adolescence as a period of storm and stress is not enough – even in the midst of the storm, many adolescents enjoy numerous aspects of their lives, they are satisfied with a large number of their

relationships most of the time, and have a positive outlook on the future. In the research of Berčić and Erceg (2019), no differences in the identity status were found in young people in development no matter if they were studying or not. However, many authors still focus on the stress and developmental tasks adolescents go through. Thus, in a study by Hauser and Sayfer (1994), direct correlations were found between anxiety and ego development in adolescents of both genders. Hauser and Sayfer state that those with higher levels of anxiety also belong to higher levels of ego development, which they explain by the fact that young people at a higher level of ego development are more aware of the complexity and uncertainty of life.

In this research, the differences in the level of expression of anxiety (as a trait) and identity status between grammar school students and art high school students were examined. Also, the correlation between the level of anxiety and identity status was examined on the sub-samples of grammar school students and art high school students.

The results show that there is a statistically significant difference between art school and grammar school students in terms of anxiety expression and identity status – identity foreclosure.

The obtained differences support the fact that art school students are on average more anxious than grammar school students, which means that students who achieve higher scores on the anxiety scale may have a more frequent and intense experience (state) of anxiety, i.e., an unpleasant emotional response when facing threatening demands or dangers compared to people who score low on this scale. Given that the choice of school is conditioned by artistic talent, education takes place in smaller groups and they are often in communication with the professors in whose class they belong to, so they are also exposed to their assessment, which increases their daily challenges at school and anxiety, because they are more often evaluated, perhaps even criticized. Grammar school students study in classes with larger groups of students. Evaluating and grading their work individually is less frequent. High school students have expectations that if they are not recognized for some special skills and talents in high school, they have a chance to do so in their university education, when they study what they are interested in. Artistically gifted students usually do not harbor such hopes and may feel anxious when they notice that they are unable to cope with the demands of their chosen school and life's difficulties (Marić, 2005).

The obtained results regarding anxiety are in accordance with the explanation of a group of authors (Smith & Carlsson, 1990; Barron, 1963; according to Vidanović and Andelković, 2006) who describe creative adolescents as generally more tolerant to high levels of anxiety. However, it contradicts the findings obtained in the research of Vidanović and Andelković (2006), which showed that there was no difference in the level of current and general anxiety in sub-samples of artistically and musically gifted adolescents and grammar school students. This can be explained by the fact that the samples in our research are somewhat different from the samples in the previously mentioned research, since musically gifted students also participated in the research by Vidanović and Andelković from 2006.

The obtained results on the differences in anxiety between grammar school students and art high school students can be additionally explained by the research

results which are in favor of the higher values of identity foreclosure in favor of grammar school students compared to art high school students.

Individuals who achieve high scores on this identity status have either not experienced a crisis or have resolved the anxiety that the crisis brought by accepting the values and patterns of functioning offered or imposed by their parents and to whom they are committed. With these people, it is difficult to discern where the ideological framework of their parents ends, and where their own begins (Rokvić, 2017). The very creator of this model, James Marcia, believes that people with identity foreclosure, given that they have accepted the life path they are currently on, should show the lowest level of anxiety (Rokvić, 2017). However, the identity foreclosure is vulnerable if life changes and challenges occur in which the adopted values and patterns of functioning do not work – then they lack the flexibility to respond to new challenges and, in the long run, they are actually more vulnerable than adolescents in moratorium (Marcia, 1980). Another study by Lillevol and associates (Lillevoll et al., 2013) supports the view that the identity foreclosure is in most cases the state with the lowest level of anxiety, unless it is compared to the level of anxiety in females who achieve high scores on the identity status of identity achievement (Rokvić, 2017). Therefore, these results can be connected with previously mentioned studies and can speak in favor of the fact that grammar school students achieve lower scores on anxiety precisely because they achieve higher scores on the identity foreclosure sub-dimension.

Adolescents who achieve higher scores on the anxiety scale also achieve higher scores on the identity moratorium dimension. Namely, the theoretical review of the identity status tells us that people with the identity moratorium status are in a state of ideological crisis, either in connection to the choice of occupation, or in connection to the philosophical and political understanding of the world. These individuals try to find a way to resolve the conflict between their parents' wishes, social pressures and their own preferences in the best possible way and are absolutely preoccupied with this inner turmoil (Rokvić, 2017). The obtained positive association between anxiety and this dimension justifies this assumption since the states of crisis and confusion can be accompanied by certain emotional states such as anxiety. Marcia believes that research and contact with experiences that have the potential to define and change the course of the rest of life represent stressful circumstances (Rokvić, 2017). It can be said that this is developmentally necessary anxiety when autonomy is being realized and free choices are made – which also implies the possibility of mistakes, unrealized plans, and betraying one's self-image. In that sense, occasional regressions and negative emotions in adolescence can be a sign of expected and not pathological development, because they accompany the achievement of important developmental tasks, especially in the vacuum between their planning and the activities that should bring them to fruition. Desired goals may not be easily attained (e.g., completion of studies, affirmation in the profession, independence and good earnings...), so this prolongs uncertainty and anxiety.

Identity diffusion and moratorium are positively related. In the turbulent and sensitive period of adolescence, it is sometimes difficult to differentiate identity

diffusion from moratorium as a constructive, but painful state. However, what essentially differentiates them is that in the identity moratorium status there is a process of physical and mental exploration of the environment in adolescents, as a quality that differentiates them according to Marcia (Marcia, 1980). This explains the significant correlation between these two identity statuses. Conversely, the correlation is lower among the artistically gifted, which supports the interpretation that there is a greater discrepancy between these identity statuses among these respondents than among grammar school students. Elements of identity diffusion are more present in grammar school students in the moratorium than in the artistically gifted adolescents, although these identity statuses do not differ significantly among the students of the two schools. The identity foreclosure is significantly more prevalent among grammar school students. They choose to take on parental values and reduce the anxiety regarding their own identity. However, according to the data in our research, the diffusion of identity is also correlated with the identity foreclosure among grammar school students, which puts this group of students at a disadvantage, regardless of the fact that their anxiety is significantly lower compared to art school students.

If we take a critical look at the research and observe the structure of the sample, it is suitable and the issue of adolescent identity formation certainly requires a more gender-balanced sample and a greater coverage of various categories of young people, as well as a greater age range. There are different vocational schools (four-year and three-year degree programs) and there are also different talents that make young people decide to choose different secondary schools. This topic could be extended to other categories of gifted adolescents. In addition, family parameters, family structure, family relations, education and occupation of parents could also be included. Other anxiety questionnaires should also be used and tested. It is an open question whether an already formed line of anxiety contributes to the choice of a secondary school where artistic and creative work contributes to increasing self-worth and to some extent anxiety is easier to bear and where, considering the type of school, there is probably less pressure to be successful in all subjects. At the same time, work is done in smaller groups, which can facilitate the formation of cohesion in the group. Perhaps the type of school, the organization of work, and to a lesser extent talent make the students decide to choose this high school.

Conclusion

What is an unequivocal conclusion is that artistically gifted adolescents, despite their more pronounced anxiety, are less inclined than grammar school students to adopt parental values and goals. They made their professional choices earlier and entered into the uncertainty of future professional affirmation.

Increased anxiety accompanies both the moratorium and the diffusion of identity, and there are no significant differences between the students of the two schools.

Although grammar school students are more inclined to conform with their parents, which is evidenced by the elevated identity foreclosure compared to

artistically gifted high school students, they have a more intimate feeling of the ambiguity of their own self.

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Status identiteta i anksioznost kod umetnički nadarenih adolescenata i učenika gimnazije

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Apstrakt

Tokom adolescencije mlada osoba se često suočava sa različitim razvojnim krizama, povišenom anksioznosću, kao i fluktuirajućim doživljajem sopstvenog identiteta. Adolescentne, kao vrlo heterogenu skupinu, ipak povezuju upravo slične krize kroz koje prolaze, a često i nesigurnost sopstvenog identiteta. Cilj ovog rada bio je ispitivanje povezanosti između anksioznosti i statusa identiteta kod dve grupe učenika – likovno nadarenih učenika i učenika gimnazije, kao i poređenje ovih grupa učenika u pogledu navedenih karakteristika. Uzorak je bio prigodan i sačinjen od 173 ispitanika ($n_M = 45$, $n_{\bar{x}} = 128$), starosti od 16 do 18 godina ($M = 16.70$, $SD = 1.06$). 49.7% procenata ispitanika pohađa srednju likovnu školu, dok su preostali ispitanici (50.3%) učenici gimnazije. U ovom istraživanju korišćen je Marsijin modifikovan upitnik identiteta i inventar anksioznosti. Rezulati su pokazali da učenici likovne škole postižu značajno više skorove od učenika gimnazije na dimenziji anksioznosti ($t_{(171)} = 4.92$; $p < 0,05$) i niže vrednosti na dimenziji preuzetog identiteta ($t_{(171)} = -3.01$; $p < .05$). Anksioznost i moratorijum identiteta, kao i moratorijum i difuzija identiteta, koreliraju u obe grupe ispitanika. Kod učenika gimnazije, preuzeti identitet je u korelaciji sa difuzijom identiteta. Može se zaključiti da gimnazijalci koji postižu veće rezultate na statusu identitetiteta i preuzetom identitetu, izbegavaju

neprijatno stanje anksioznosti i tako manje traže odgovore koji se odnose na njihov identitet i vrednosti. Međutim, iako na taj način smanjuju nivo anksioznosti, njihov identitet i dalje ostaje pomalo nejasan i razuđen.

Ključne reči: identitet, status identiteta, anksioznost, adolescencija

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The Role of Emotional Development of Employees and People-Oriented Leadership in Perceiving Psychological Safety in Organizations^{1*}

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Abstract

The aim of this study was to examine whether the emotional development of employees, specifically attachment, acts as a moderator determining the conditions under which people-oriented leaders can enhance the sense of psychological safety within their teams. A total of 246 participants (54% female), aged 22 to 59 ($M = 32.10$; $SD = 7.58$), employed in corporate-type organizations, took part in the research. The instruments used included the Psychological Safety Questionnaire, the Serbian version of the Experiences in Close Relationships Scale, and the People-Oriented Leadership subscale from the Ethical Leadership Scale at Work. The results revealed that the dimension of anxiety predicted psychological safety, and a statistically significant interaction was observed between this dimension and people-oriented leadership. The findings demonstrated that a positive inner model could significantly enhance the perception of psychological safety when the effect of people-oriented leadership was absent. However, it was also found that as the effect of people-oriented leadership increased, psychological safety increased as well, independently of the level of employee attachment. The practical implications of these results were discussed, considering the context of attachment theory and the conservation of resources theory.

Keywords: attachment, people-oriented leadership, psychological safety, conservation of resources theory

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The Role of Emotional Development of Employees and People-Oriented Leadership in Perceiving Psychological Safety in Organizations

Psychological safety

Psychological safety, as a concept increasingly explored in the organizational context, plays a crucial role in fostering a productive and healthy work environment. This concept refers to the subjective sense of security, support, and belonging that employees experience in their workplace. When they feel psychologically safe, employees are free to express their ideas, take risks, and contribute to innovation. Edmondson (1999) describes psychological safety as dependent on employees' perception of whether expressing their ideas, thoughts, or concerns will be accepted or condemned by their colleagues and superiors. This theory suggests that a key element in creating psychological safety within an organization is employees' ability to feel secure in expressing their views without fearing negative consequences (Kozlowski & Bell, 2003).

A series of studies has provided support for the theory of psychological safety and revealed numerous benefits that this concept can bring to organizations. Psychological safety is crucial for building trust and cooperation among employees. When employees feel assured that their ideas will be heard and respected, they are more likely to actively engage in teamwork and support their colleagues. This fosters a positive work atmosphere and enhances team efficiency (Edmondson, 1999; Kahn, 1990; O'Boyle & Harter, 2013). Moreover, psychological safety directly impacts employee engagement. Employees who feel psychologically secure are more likely to be engaged in their tasks, displaying higher levels of commitment and motivation. This can have a positive influence on their work ethic, job performance quality, and achievement of organizational goals (Newman et al., 2017). Carmeli and Gitel (2009) investigated the relationship between psychological safety and learning from failure within an organization. Their results showed that teams that feel psychologically safe have a greater ability to learn from failure and identify new opportunities for improvement. This adaptability and innovation among teams provide the organization with a competitive advantage.

Creating psychological safety helps establish an open and supportive work environment where employees can freely express their ideas and opinions. This fosters information exchange, learning, and innovation among employees, which can lead to the development of new ideas and process improvements. A meta-analytic review conducted by Frazier et al. (2017) explored the relationship between psychological safety and organizational performance. Their findings confirmed a positive association between psychological safety and performance, including productivity and employee engagement. Employees who feel psychologically safe are more motivated, creative, and dedicated to their work, reflecting positively on the overall productivity of the organization.

People-oriented leadership

Organizations that foster a people-oriented culture, promoting support, teamwork, and open communication, are more likely to develop a high level of psychological safety among employees. When an organization creates an environment that values individuality, supports the expression of opinions and ideas, and encourages open dialogue, employees feel secure and supported (Leroy et al., 2013).

A series of studies emphasizes the importance of leader support and a people-oriented organizational culture in creating and maintaining psychological safety within an organization (Detert & Edmondson, 2011; Edmondson, 1999; Eisenbeiss et al., 2008; Leroy et al., 2013). Research has shown that leaders who provide support to employees and demonstrate concern for their well-being create an atmosphere of psychological safety. Emotional support, open communication, and showing care for employees encourage feelings of security and prompt employees to express their ideas and opinions publicly (Eisenbeiss et al., 2008). People-oriented leaders are receptive to feedback, support ideas, and foster teamwork, which contributes to employees' sense of psychological safety. Additionally, people-oriented leaders show interest in employees' needs and are willing to listen to what employees have to say (Detert & Edmondson, 2011). If employees perceive a high interpersonal risk, they may avoid openly expressing their thoughts, sharing their ideas, or discussing situations, leading to the development of a so-called "culture of silence" (Detert & Burris, 2007).

Organizational behavior in the context of attachment theory

Attachment Theory, developed by John Bowlby, provides insight into the relationship between emotional bonds formed in early childhood and adult behavior. Although initially applied to understanding child development, research has shown that attachment principles can also be applied to the context of work and organizations (Nesse et al., 2021).

Individuals who have developed a secure attachment in childhood, having caregivers who were sensitive and consistent in meeting their needs, are more likely to develop a positive attitude toward work (Carmeli, et al, 2010; Colbert et al., 2004). The sense of security and connection derived from a secure attachment can be transferred to the work environment, creating a positive work atmosphere and increasing employee engagement (Perry & Piderit, 2018). Conversely, individuals who formed insecure attachments in childhood, perhaps experiencing unpredictability or rejection, may develop a negative attitude toward work, displaying lower engagement and a greater propensity for negative emotions.

Secure emotional attachment in the work context can provide a foundation for developing psychological safety at work. When employees feel that their needs for acceptance, support, and belonging are met in the workplace, they are more likely to be open to collaboration, innovation, and learning (Eisenbeiss et al., 2008).

In contrast, insecure attachments in childhood may lead to a lack of trust, fear of intimacy, and mistrust of others in the workplace, which can limit psychological safety and disrupt effective teamwork (Shore et al., 2019).

Leaders who are sensitive to employees' emotional needs, providing support, understanding, and security, can facilitate the development of emotional connection with employees (Frazier et al., 2020). These leaders typically create an atmosphere that supports open communication, mutual trust, and teamwork. Conversely, leaders who demonstrate inconsistency, unpredictability, or lack of support can evoke feelings of insecurity among employees, which may result in reduced motivation, low loyalty, and low productivity (Mikulincer & Shaver, 2016). Therefore, attachment theory can be useful in identifying effective leaders and developing leaders who promote security and engagement in organizations.

The dimensional approach in the attachment theory (Griffin & Bartholomew, 1994) replaces categorical classification with continuous scales, focusing on working models of self and others. Anxiety (self-working model) involves the degree of worry or uncertainty a person experiences within relationships, while Avoidance (working model of others) involves a person's inclination to emotionally distance themselves from other people or avoid intimacy. This approach provides a more comprehensive understanding of individuals' emotional dynamics in their relationships, focusing on their perceptions of both themselves and others.

Organizational behavior in the context of conservation of resources theory

Another context to consider when examining defensive decision-making is the Conservation of Resources Theory (Hobfoll & Shirom, 2000). This theory is based on the principles of resource preservation and resource acquisition. The premise is that individuals with limited resources are more motivated to protect them from depletion and acquire new resources that help them cope with various situations in the future (Hobfoll, 1989). In line with the principle of resource preservation, an insecurely attached individual may be inclined to avoid any risks as risks could jeopardize them, primarily due to their existing resource scarcity. However, the actions of a supportive leader can make the individual more willing to take risks because they perceive support as a valuable resource. Individuals respond by seeking additional resources or conserving their current resources by reducing resource expenditures (Hobfoll, 2002). From the perspective of the Conservation of Resources Theory, individuals who have more resources in situations requiring risk-taking also show a greater willingness to take risks as they see an opportunity to enhance their business outcomes.

Focus of the present study

Numerous studies mentioned earlier have shown that psychological safety is directly related to the behavior of leaders and organizational culture (Carmeli et al.; Grant & Ashford,

2008). Leaders who are people-oriented in their actions and attitudes clearly reflect that they care about all employees and are concerned about them, which leads to higher perceptions of psychological safety among employees, i.e., a sense of freedom to openly express their thoughts and opinions with less fear of judgment (Carmeli et al., 2009). While the role of the organization and leaders in this case is undeniable, the question arises as to whether “employees’ personal insecurity” can influence the perception of leader behavior and team members, and thereby the experience of psychological safety in the workplace. In this study, we would assume that an individual’s emotional development, specifically the attachment they have developed throughout their lives toward themselves and other individuals, acts as a moderator in the relationship between the perception of leader behavior and their people-oriented leadership on one hand, and the perception of psychological safety on the other. The assumption is that a lack of self-trust or trust in others can significantly diminish the effects of people-oriented leadership compared to the effects it achieves independently. Therefore, we aim to investigate whether secure attachment can enhance this relationship further. According to the Conservation of Resources Theory, it is expected that individuals who have an insecure self-image and/or mistrust toward others or lack support from their leaders would not exhibit behaviors that indicate a willingness to take risks in the team. Conversely, it is expected that any form of support could contribute to a greater inclination to speak up within the team, meaning that individuals would feel more psychologically safe.

Method

Sample

The initial sample of the study consisted of 254 participants. The inclusion criteria for participation in the research were: the respondents were employed in a privately-owned company (as working conditions in private organizations in Serbia may differ), they had been in their current employment for at least six months in a team with the same supervisor, had a clear hierarchical superior for evaluating their relationship, and were part of a team with the same supervisor, including at least two other individuals (to evaluate the team). After removing multivariate outliers (based on critical Mahalanobis distance values; Tabachnick & Fidell, 2007), the final sample included a total of 246 participants. The sample size estimation was conducted using the M*Power software (Faul, et al., 2007; Faul, et al., 2009), which indicated a minimum of 161 participants. Part of the sample was collected using a convenience method, distributed through the social network LinkedIn, while the other part was obtained using the snowball distribution method via email in several different companies in Serbia. The average number of years of experience of the respondents who completed the questionnaires was 7.59 (min = 1; max = 33; $SD = 6.84$), with 54% of the participants being female, ranging in age from 22 to 59 ($M = 32.10$; $SD = 7.58$). The majority of respondents had higher education degrees (85.4%), with significantly fewer having completed vocational school (8.5%) or doctoral/master’s studies (6.1%). A total of 91.1% of the respondents lived in urban areas, while the remaining were from rural or semi-urban areas.

Measures

Psychological Safety Questionnaire (Edmondson, 1999). A 7-item one-dimensional questionnaire was used, where respondents provided their answers on a 5-point Likert-type scale (1 - *strongly disagree*; 5 - *strongly agree*). The questionnaire was unidimensional and it was adapted to the Serbian language using the back-translation method for the purposes of this study. An example item from this dimension is: "If you make a mistake in my team, you will often be reprimanded for it." The questionnaire has shown good metric characteristics in this sample, with a reliability score expressed by Cronbach's alpha coefficient of internal consistency at .807. Confirmatory factor analysis yielded excellent fit indices ($\chi^2 = 33.57, p = .00$; $df = 12$; $CFI = .96$; $TLI = .93$; $RMSEA = .07, p = .04$; $SRMR = .05$).

Experiences in Close Relationships Scale - Serbian version (SM-ECR-R; Brennan, et al., 1998; Serbian adaptation by Hanak & Dimitrijević, 2013). The two-factor structure (dimensions of Anxiety and Avoidance) has been confirmed in most studies, and these dimensions represent working models of self and others. A meta-analysis of self-report attachment measures (Graham & Unterschute, 2014), conducted in a total of 564 studies, demonstrated that ECR-R dimensions exhibit excellent psychometric characteristics ($\alpha > .80$) across different samples, making it the most reliable self-report measure. The Serbian version of this questionnaire has also demonstrated satisfactory reliability, good convergent and predictive validity, and confirmed the assumed factor structure (Hanak & Dimitrijević, 2013). The SM-ECR-R questionnaire consists of 36 items, and respondents provide their answers on a 7-point Likert-type scale (1 - *strongly disagree*; 7 - *strongly agree*). Both scales demonstrated good reliability in this sample: Anxiety ($\alpha = .91$) and Avoidance ($\alpha = .88$).

Ethical Leadership at Work Questionnaire - People-Oriented subscale (ELW; Kalshoven et al., 2011). Ethical leadership at work is an instrument designed to help understand the necessary antecedents and consequences of moral leadership. The instrument consists of 38 items distributed across seven dimensions: People-Orientation, Fairness, Power Sharing, Concern for Sustainability, Ethical Guiding, Role Clarification, and Integrity. Responses are given on a 5-point Likert-type scale (1 - *strongly disagree*; 5 - *strongly agree*). For the purposes of this study, only the isolated People-Oriented dimension was used. Examples of items from this subscale include: "He/she is interested in how I truly feel and how I'm doing at work" and "He/she takes time to talk with me about how I feel at work". The scale demonstrated excellent reliability ($\alpha = .94$), and confirmatory factor analysis yielded excellent fit indices ($\chi^2 = 35.24, p = .00$; $df = 14$; $CFI = .98$; $TLI = .98$; $RMSEA = .08, p = .07$; $SRMR = .02$).

Data Analysis

Statistical analysis was conducted using IBM SPSS Statistics for Windows, Version 23.0, while the AMOS add-on was used to verify the psychometric characteristics of the test. Descriptive statistics (mean, standard deviation, percentages, skewness, and kurtosis),

correlational techniques (Pearson's correlation coefficient), and multiple regression analysis were employed as statistical procedures. The levels of predictor variables used in the interaction were calculated according to the method of authors Aiken and West (Aiken & West, 1991), where high, medium, and low expression were computed as one standard deviation above and below the mean. Centered values of predictors were used (Robinson & Schumacher, 2009). We used five key fit indices: χ^2 (Chi-Square), CFI (Comparative Fit Index), TLI (Tucker-Lewis Index), RMSEA (Root Mean Square Error of Approximation), and SRMR (Standardized Root Mean Square Residual). Acceptable thresholds for these indices include (Kaplan, 2000) a non-significant p-value for χ^2 , CFI $> .95$, TLI $> .90$, RMSEA $< .08$, and SRMR $< .08$.

Results

First, the basic descriptive statistics of the variables used in the study, as well as the results of the correlation analysis illustrating the intercorrelation between dimensions, will be presented.

Table 1
Correlation between variables and descriptive statistics of the variables used in the study

	Anxiety	Avoidance	People-Orientation	Psychological Safety
Avoidance	.30***			
People-Orientation	-.11	-.13*		
Psychological Safety	-.24***	-.11	.50***	
<i>Min</i>	1.00	1.39	1.00	1.00
<i>Max</i>	6.17	6.39	5.00	5.00
<i>M</i>	2.53	3.37	3.71	3.86
<i>SD</i>	1.08	.94	1.07	.80
<i>Sk</i>	1.11	.48	-.62	-.80
<i>Ku</i>	.90	-.01	-.61	.56

Note. Sk – Skewness; Ku – kurtosis; *p < .05, ***p < .001

The results of the correlation analysis presented in Table 1 indicate a statistically significant correlation between people orientation and psychological safety. However, people orientation shows only a low and negative correlation with avoidance, and it does not correlate with anxiety. Nevertheless, this is not a prerequisite for further analyses, as the assumed interaction between these variables can still exist even in the absence of a correlation. Psychological Safety correlates negatively and weakly with anxiety, while the correlation with avoidance is not significant.

Table 2*People orientation and anxiety as predictors of psychological safety*

	β	<i>t</i>	<i>p</i>	r_g	Model summary
People-orientation	.45	8.43	.00	.50	$R = .57$
Anxiety	-.18	-3.43	.00	-.24	$R^2 = .33$
People-orientation *Anxiety	.21	3.88	.00	.28	$F(3, 242) = 39.39$ $p < .001$

The results of the multiple regression analysis showed that the regression model is statistically significant and can account for 32.8% of the variance in the criterion. The statistically significant predictors from this set of variables are both individual variables (people orientation and anxiety) and their interaction, which also makes a statistically significant contribution.

Table 3*People orientation and avoidance as predictors of psychological safety*

	β	<i>t</i>	<i>p</i>	r_g	Model summary
People-orientation	.49	8.69	.00	.50	$R = .51$
Avoidance	-.05	-.95	.34	-.12	$R^2 = .26$
People-orientation *Avoidance	.08	1.48	.14	.14	$F(3, 242) = 28.43$ $p < .001$

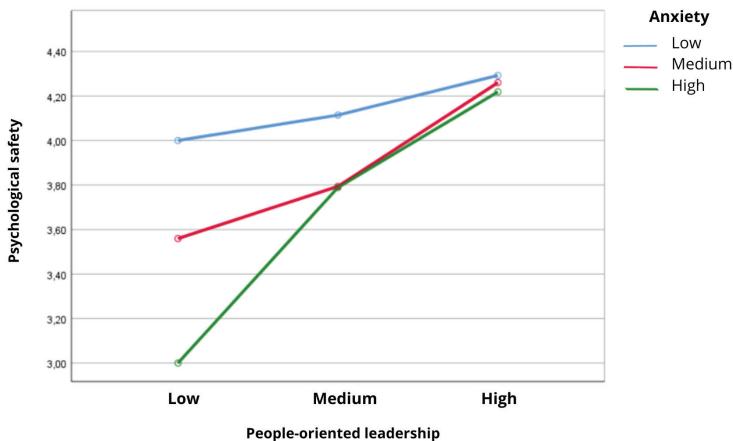
The results of the multiple regression analysis showed that the regression model is statistically significant and can account for 26.1% of the variance in the criterion (psychological safety). The statistically significant predictor from this set of variables is only people orientation, while neither avoidance nor the interaction between these two dimensions have a statistically significant effect in predicting psychological safety.

Next, the interaction between the dimensions of people orientation and anxiety will be graphically presented.

Participants were categorized into one of three groups based on their scores both on the anxiety and people-orientation dimensions. The distribution was determined by classifying high, medium, and low expression as values one standard deviation above and below the mean. In Figure 1, we can observe that in the case of low people-oriented leadership, there is a significant difference in the level of psychological safety among all three levels of anxiety. This difference between individuals with high and moderate scores on anxiety disappears at the average level of people-oriented leadership scores, while individuals with low anxiety scores still have a higher perception of psychological safety compared to the other two groups. The difference between the high, low, and moderate anxiety groups almost completely disappears in the group of participants with high people-oriented leadership scores, and the score they achieve is higher than the highest average score in the low and moderate people-oriented leadership groups.

Figure 1

Moderating role of anxiety in the interaction of people-oriented leadership and psychological safety



Discussion

The aim of this study was to examine whether internal working models of self (anxiety) and others (avoidance), specifically attachment orientation, act as a moderator in the relationship between the perception of leader behavior and their people orientation on one hand, and the perception of psychological safety on the other. In other words, the study investigated whether the lack of self-assurance or trust in others could significantly diminish the effects of people-oriented leadership or amplify this effect in the perception of psychological safety. The results partially supported the hypothesis.

Numerous studies have confirmed that leadership, particularly supportive and employee-oriented leadership, is associated with positive outcomes (Carmeli et al., 2009; Grant & Ashford, 2008). This provided the foundational premise for this study. Additionally, team dynamics and employee integration into a team largely depend on the relationship with their supervisor (Carmeli et al., 2009). The correlation between people-oriented leadership and psychological safety was also found in this study. The moderate positive correlation suggests that fostering leadership where supervisors are oriented toward employees, demonstrating care and concern for all employees through their actions and attitudes, is likely to be associated with higher levels of perceived psychological safety, where employees feel a greater sense of freedom to openly express their thoughts and opinions and experience less fear of judgment.

However, the primary focus of this study was on the influence that personal characteristics of the employee, such as the quality of their attachment orientation, and working models of self and others belonging to this psychological construct,

might have on the relationship between leadership and team atmosphere. The results indicated that low anxiety was negatively related to perceived psychological safety. For instance, individuals with a negative working model of self may be hesitant to express their ideas, fearing criticism, rejection, or punishment. They may withdraw from discussions or team activities, avoiding the expression of their opinions or innovative ideas (Detert & Burris, 2007). Such individuals might also exhibit behavior characterized by excessive caution in their work, fearing mistakes or failures, which could lead to heightened discomfort and increased feelings of worry and tension, characteristics associated with individuals with a negative working model (De Dreu & Weingart, 2003; Kahn, 1990; London et al., 2023).

The results further demonstrated that this assumption about the role of personal characteristics in the relationship between leadership and team atmosphere was empirically supported. Specifically, the interaction between people-oriented leadership and anxiety had a statistically significant effect in predicting psychological safety. This finding implies that the effect of people-oriented leadership on the prediction of perceived psychological safety in the organization varies depending on the level of expressed anxiety.

The importance of both factors (leadership and individual characteristics) in the perception of psychological safety becomes evident when comparing the three levels of leadership support. In situations where leadership support is lacking, individual resources come into play as a form of compensation – if there is no support from the leader, support can be found within oneself. Similarly, if both types of support are absent, the level of perceived psychological safety is significantly lower. The same pattern is evident in the group where both dimensions (leadership and anxiety) have average values. The sense of security and connection arising from secure attachment in these individuals likely contributes to the creation of a positive work atmosphere, willingness to take risks, and willingness to express oneself within the team (Perry & Piderit, 2018). Psychological safety is significantly more perceived in situations where some form of people-oriented leadership by the supervisor exists, but the presence of individual resources, such as a positive self-image, seems to strengthen this perception further.

Lastly, strong support from a people-oriented leader demonstrates that internal working models have practically no significance for the perception of psychological safety, as all three groups exhibit high scores with negligible differences. Based on these results, it appears that the role of the leader in the perception of psychological safety within the team is more significant than assumed. A leader who understands and supports employees, while nurturing emotional support and open communication, also promotes a sense of security and motivates employees to express their ideas and opinions openly (Eisenbeiss et al., 2008). This finding suggests that this type of leadership can significantly reduce the insecurity experienced by employees stemming from powerful early experiences that influence their behavior toward others and their relationships in adulthood.

This finding is entirely consistent with the Conservation of Resources Theory. The results confirm that both types of support can significantly enhance the sense of

psychological safety, and in the absence of resources, avoidance behavior prevails to reduce potential risks' effects. This finding is similar to those of other researchers who report that despite awareness of the potential gains from choosing a riskier option, motivation to avoid further resource losses prevails (Hobfoll, et al. man, 2018; Ito & Brotheridge, 2003).

Conclusion

The results of this study clearly indicate that both mentioned resources are of great importance and can even play a crucial role in the perception of psychological safety. Although the undoubtedly significant influence of early development on adult individuals and their worldview is present, there seem to be mechanisms that can compensate for the lack of self-esteem and self-belief. Conversely, it is essential to understand that in situations where external factors are unsupportive and when support from superiors at work is scarce, a positive self-image can act as a personality protective factor within a team where risk-taking, expressing opinions, or any form of stepping out of the comfort zone is required.

In addition to enriching the already extensive knowledge in the field of emotional development, the results of this study provide useful guidance for practitioners in the field of work psychology, especially those increasingly focusing on creating psychologically safe environments within teams.

However, this study also has its limitations that need to be acknowledged. The confirmed result in this study is straightforward and does not control for the influence of many other factors related to the team and team dynamics, which are likely crucial for the perception of psychological safety. Moreover, the results are only generalizable to a specific segment of employees, those working in corporate-type organizations, where there are usually managers who are highly aware of their responsibilities and work with the support of human resources experts. One should not overlook the fact that the sample of participants encompasses a relatively wide age range, potentially leading to variations in the perception of psychological safety, especially among those with longer tenures. Additionally, although this study presents causal inferences in some of its conclusions, it is based on a correlational-regression design, so caution is needed when making conclusions about the direction of influence. A more structured sampling approach would also contribute to validity, considering that the convenience sampling method used in the study has the potential to increase participant bias.

Future research should delve deeper into the conditions within the team itself and explore in greater detail which components of people-oriented leadership have the most significance in this relationship. The development of highly functional teams undoubtedly depends on all stakeholders influencing them, and studies of this nature can contribute to enhancing the team's mental health, job satisfaction, and engagement, and subsequently improve overall team performance.

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Uloga emocionalnog razvoja zaposlenih i liderstva usmerenog na ljude u percepciji psihološke bezbednosti u organizacijama

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Apstrakt

Cilj ovog rada bio je ispitati da li emocionalni razvoj zaposlenih, odnosno afektivna vezanost, deluje kao moderator koji određuje uslove pod kojima lideri usmerenosti na zaposlene mogu da pojačaju osećaj psihološke bezbednosti u timovima u svojim organizacijama. U istraživanju je učestvovalo ukupno 246 ispitanika (54% ženskog pola), starosti od 22 do 59 ($AS = 32.10$; $SD = 7.58$) i zaposlen u organizacijama korporativnog tipa. Primenjeni su Upitnik psihološke bezbednosti, Skala iskustva u bliskim odnosima – srpska verzija i subskala Liderstva orijentisanog na ljude iz Skale etičkog liderstva na radu. Rezultati su pokazali da je dimenzija Anksioznost prediktor Psihološke bezbednosti kao i da postoji statistički značajna interakcija ove dimenzije sa Liderstvom orijentisanim na ljude. Rezultati su pokazali da pozitivan radni model sebe može značajno povećati doživljaj psihološke bezbednosti ukoliko izostane efekat liderstva orijentisanog na ljude, ali i da kako raste efekat liderstva raste i Psihološka bezbednost, nezavisno od nivoa afektive vezanosti zaposlenog. Diskutovani su praktični rezultati, dok su rezultati sagledani primarno iz konteksta teorije afektive vezanosti i teorije konzervacije resursa.

Ključne reči: afektivna vezanost, liderstvo usmereno na ljude, psihološka bezbednost, teorija konzervacije resursa

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Anomie and psychological violence as predictors of perpetrated physical violence in close relationships by female adults^{1*}

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Abstract

The aim of this research was to examine the predictive power of the anomie and dimensions of psychological violence in predicting perpetrated physical violence by female adults. The sample was convenient and consisted of 341 female adults, aged 18 to 65 years ($M = 25.04$, $SD = 8.97$). Anomie was assessed by the scores on the Perception of Anomie Scale. Violent behavior was assessed by The Violent Behavior Questionnaire among adults (VBQ; dimensions: mocking and making rough jokes, machinations and plotting and insulting and threatening (psychological violence), light hitting, poking, pushing and beating with or without objects (physical violence)). Two hierarchical regression analyses were conducted. In the first model age was included, in the second anomie and in the third dimensions of psychological violence. The results suggest a significant model for light hitting, teasing, pushing away ($R^2 = .37$, $F_{(5,335)} = 39.93$, $p < .001$) with anomie ($\beta = .12$, $p = .006$), mocking and making rough jokes ($\beta = .29$, $p < .001$) and insulting and threatening ($\beta = .33$, $p < .001$) being the significant predictors. The results also suggest a significant model for beating with or without objects ($R^2 = .23$, $F_{(5,335)} = 20.19$, $p < .001$) with age ($\beta = .15$, $p = .004$), anomie ($\beta = .10$, $p = .044$), machinations and plotting ($\beta = .15$, $p = .012$) and insulting and threatening ($\beta = .29$, $p < .001$) being the significant predictors. The results indicate the connection of different forms of violent behavior. In addition, they show the importance of the wider social context in predicting violent behavior e.g., the personal experience of alienation from society in which the individual lives.

Keywords: anomie, psychological violence, physical violence, close relationships, female

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Violence as a social phenomenon can be understood in different ways. The World Health Organization (WHO, 2002) defines this phenomenon as the intentional use of physical force and power by threat or action against oneself, against another person, or against a group of people or an entire community, which could result or results in injury, death, psychological consequences, lack of development or deprivation. The prevalent understanding is that men are more likely to be perpetrators of violence than women. Consequently, a significant amount of research has been conducted to examine the characteristics and relationships of various variables with male-perpetrated violence. Some reasons for the insufficient investigation into men as victims (and their characteristics) of violence include the existence of a “gender paradigm” that implies gender asymmetry, as well as the societal cultural belief that men are capable of defending themselves, and that violence committed by women against men is rare (Carney et al., 2007). However, there is research that confirms that women can be perpetrators of violence against men (Straus, 2015). Therefore, the aim of this research is to investigate violence committed by women in close relationships.

Physical and psychological violence

Violence can be manifested in different contexts and interpersonal relationships; it can have different forms of manifestation and different consequences. As the most common forms of violence in interpersonal relationships we can consider physical and psychological violence.

Physical violence is realized by the use of physical force or against another person in order to inflict or attempt to inflict physical injuries (Krstinić & Vasiljković, 2019). This type of violence refers to numerous behaviors that can cause pain or some kind of injury (physical injury or mental pain) (Lukić & Jovanović, 2003). Some of the manifestations of physical violence are: scratching, slapping, pushing, hitting or holding someone against a wall, biting, choking, inflicting burns, throwing objects at a partner/partner, pulling hair, beating someone, assaulting, locking the victim in a room or throwing the victim out of the house and forcing the victim to leave the house (Janković, 2023). Signs of physical violence in most cases are visible and manifest as injuries on the face, legs, arms, chest, stomach, in the form of hematomas, cuts, scratches, burns, bone fractures and strangulation marks on the neck (Vilić Konstantinović, 2013). Also, in most cases, psychological violence is not recognized until there is an escalation in behavior and severe visible consequences (Seleš, 2020).

In a study in which respondents were females in treatment for abusive behavior, context and motivation for abusing were examined (Babcock et al., 2003; as cited in

Seleš, 2020). Based on the obtained results, the authors grouped the women into two categories: 1) Partner Only (women use aggressive behavior only toward intimate partners); 2) Generally Violent (women use aggressive behavior in various situations). This grouping is based on the assumption that people who manifest violent behavior in different situations are often violent at home and toward an intimate partner. The most common reason for this behavior is that women believe that violence is an adequate response to conflict resolution. Also, some women can control their violent behavior in front of other people and use it only toward their partner.

It has been shown that domestic violence mostly involves physical abuse (Krstinić & Vasiljković, 2019), which often regularly co-occurs with various forms of psychological abuse with the goal to control the victim and establishing power over the victim (Matijašević-Obradović & Stefanović, 2017). Furthermore, in most cases, where a man is arrested as a perpetrator of violence, the type of violence was physical and when a woman is the perpetrator, the basis for the arrest is psychological violence (Dimitrijević et al., 2016). There is some evidence obtained in studies that support the gender symmetry in perpetration of physical assaults against partners (Desmarais et al., 2012; Winstok, 2012) and some unsupportive evidence (Mamula & Dijanić Plašč, 2014).

Psychological violence can be defined in different ways because of many indicators that can refer to this type of violence. This type of violence can also be found in the literature as emotional, verbal or nonphysical abuse or aggression (Lagdon et al., 2014). Psychological violence refers to some kind of intentional use of power against another person or another group and that can result in harm to personality development (physical, mental, moral, social aspects of development; Di Martino, 2002). This type of violence can include many behaviors such as humiliating, ridiculing, insulting (Rippon, 2000), stalking (Bonomi et al., 2012) and acts such as harassment and threats (Di Martino, 2002). Some other behaviors that can refer to psychological violence are belittling, ignoring, cursing, mocking, complaining, intimidating, controlling (including jealous behavior), isolating, contempt, bullying, blaming and verbal attack (Fernández- González et al., 2012; Ignjatović, 2011; O'Leary & Slep, 2003; Orpinas et al., 2012; as cited in Janković, 2023). Dokkedahl et al. (2019) suggest that acts of psychological violence can be ordered by intensity and because of that, acts can be considered using a continuum that begins with a psychological aggression (for example: yelling and insults) and ends with severe abuse which has coercive characteristics (for example: isolation and threats). Listed acts and behaviors indicate that a person uses them to terrorize, intimidate, control, belittle another person with the goal to limit and destroy his/her self-esteem and well-being (Saltzman et al., 2002; as cited in Lagdon et al., 2014). In one study, women who were battered by their partners reported that their experiences of psychological abuse were more damaging to their well-being than their experiences of physical violence (Follingstad et al. 1990). Furthermore, some evidence suggests that coercive control contributes to the destructive psychological effects of domestic violence (anxiety, depression, posttraumatic stress disorder) more than physical violence does (Stark, 2006). Also, some authors found that

psychologically abusive behaviors often occurred more frequently, even on a daily basis, than physically abusive behaviors and that might permeate part of interactions between a victim and a batterer on a daily basis (Marshall, 1999).

In the context of feminist theory-based research, authors suggest that gender inequity is especially important and because of that inequity, women use intimate partner violence with a goal of self-defense or as a response to their partner's abuse pattern (Dasgupta, 2002; Dobash & Dobash, 2004; Swan & Snow, 2006; Worcester, 2002). Moreover, in the context of family conflict research, there is some evidence that men and women have similar motivations relating to conflict resolution and these are mainly anger and desire to resolve conflicts (Straus, 2005). In some societies, men usually have more physical and social power than women and because of that women are often taught through the process of socialization to accept and assume a passive role and that they cannot be very successful in controlling their partners (Dasgupta, 2002; Worcester, 2002). However, there is some evidence that both men and women use intimate partner violence for coercive control (Hamby, 2009) and that they use control in different ways; precisely, women use control with a goal to gain autonomy and control through coercive tactics within both violent and nonviolent relationships (Johnson & Ferraro, 2000) and men use control to demonstrate authority in relationships (Kernsmith, 2005). Furthermore, among women, in the context of intimate partner violence, their perpetration may co-occur with their victimization and as an explanation authors suggested that is because women may use violence with a goal to protect themselves and their children or in retaliation to being victimized (Chen & White, 2004; Dasgupta, 2002; Hamberger & Guse, 2002; Kimmel, 2002). As a summary, some authors examined women's motivations for aggressive behaviors against their intimate partners and they found that motivations can be organized in two types: 1) defensive/reactive/self-protective motives and 2) active motives/goal oriented (for example: retaliation, attempts to control the partner; Swan & Snow, 2006).

In the context of parent-child violence and aggressive behavior, results obtained in some studies showed that antisocial personality, conflict in the family, negative relations with adults and parental use of psychological aggression toward intimate partners were predictors of self-reported youth aggression (Ferguson et al., 2009). Also, antisocial personality traits and delinquent peers were best predictors of bullying behavior (Ferguson et al., 2009). Moreover, if a person was exposed to violence during childhood that can be linked to involvement in a violent intimate relationship (Langhinrichsen-Rohling et al., 2004), dating violence victimization and also future perpetration, but it is also important to mention that not all victims are perpetrators (Gover et al., 2008). Related to previously mentioned empirical findings and theoretical assumptions is the cycle of violence hypothesis that suggests that children who experience abuse are more likely to experience and also perpetrate violence in the future (Heyman & Sleps, 2002; Linder & Collins, 2005). Also, the cycle of violence can be considered in the context of social learning theory (Bandura, 1969) which assumes that a person's behaviors are learned through the observations and because of that if a person was abused during childhood, that person may believe

(as he/she ages) that aggression is a method for dealing with interpersonal conflict (Manchikanti Gómez, 2010). Moreover, there is some evidence that juveniles who abuse their parents may, at some point in time, show an escalation in violent behavior. Precisely, abuse toward parent(s) mostly begins with verbal violence and may progress during time in frequency as well as in intensity and verbal violence may be changed by severe psychological or physical abuse (Eckstein, 2004). It is important to mention an escalation hypothesis that suggests that relations between a parent and a child are dynamic interactions which tend to conflict and the intensification process may increase to the point that even parricide may be the culminating action (Walsh & Krienert, 2009). In the context of child use of violence toward their parents, obtained results in some studies suggest that males are more likely to use physical abuse, while females are more likely to use psychological abuse (Evans & Warren-Sohlberg, 1988; Nock & Kazdin, 2002).

Many studies were conducted with a goal to examine sex differences in violence victimization and perpetration and obtained results were not consistent. Some of the studies showed that females are more likely to perpetrate psychological than physical violence against males (Straus et al., 1996). Other studies suggested that women are almost always violent if they are abused by their male partners (Abel, 2001; Hamberger & Guse, 2002) or that women are at least as likely as men to use violence in their relationships (Archer, 2000; Chase et al., 2003) and that there is gender symmetry among couples (Archer, 2000; Fiebert & Gonzalez, 1997). Similar results showed that, when respondents were students, men and women commit similar rates of physical aggression (Cercone et al., 2005). Archer (2000) in a meta-analysis obtained results that indicate that when men's and women's use of intimate partner violence were compared, women were more likely to have ever used physical intimate partner violence and that using violence occurred more frequently. It is also important to mention that some authors suggest that violence that men use is much greater than women's in the context of all areas outside the home (Worcester, 2002). That result is consistent with another result which suggests that girls usually show more violent behavior within home than outside home and that boys are more likely to show violent behavior toward strangers (Cairns et al., 1988).

Two types of violence, psychological and physical, are often considered together and based on research and theoretical evidence it can be said that these two types of violence are distinct and also related (Greenfield & Marks, 2010). Because of that, there were suggestions on how psychological and physical violence can be differentiated: 1) whether or not the act of violence is physical or psychological/nonphysical; 2) whether or not the consequences of the act are physical or psychological/nonphysical (McGee & Wolfe, 1991). Moreover, although it has been shown that psychological and physical abuse can be intertwined, some authors suggested that their dynamics and patterns are not completely identical (Jacobson et al., 1996; O'Leary, 1999).

Therefore, psychological abuse is generally understudied compared to physical abuse. Most studies have been conducted in the context of intimate partner violence. Some studies that examined relations between psychological and physical violence showed that

people who experience psychological violence are more likely to be victims of physical violence (Lanza et al., 2006). There is some evidence that physical and psychological abuse often co-occur, precisely, abuse patterns tend to co-occur and it showed that victimization in one domain is associated with an increased likelihood of victimization in other areas (Claussen & Crittenden, 1991). Also, obtained results in some other studies suggested that two different types of abuse, psychological and physical, were highly correlated (Baldry, 2003) and that frequency of verbal disagreements and high levels of interpersonal conflict are strongly associated with physical violence (Hoffman et al., 1994; Jewkes et al., 2002). Furthermore, some authors found that psychological type of violence can precede or follow or co-occur with physical type of violence (Lukić & Jovanović, 2003; Nedimović & Biro, 2011; Stets, 1991). It showed that most women who experience physical violence by their intimate partner also report that they experience psychological violence (Dutton & Painter, 1993). Similar results showed that jealous and possessive male partners who commit verbal violence against their female partners and deny them access to their family, friends or family income tend to commit physical violence as well (Tjaden & Thoennes, 2000; as cited in Kaukien, 2004). Nonphysical, psychological violence can be conceptualized as a predictor of physical violence and that result is consistent with some other results obtained in previous studies (Dutton et al., 1996; Harned, 2002; Macmillan & Gartner, 1999; Murphy & O'Leary, 1989). Furthermore, there is some evidence that stalking, as an indicator of psychological violence, can be a risk factor for some escalated forms of physical violence, even femicide (McFarlane et al., 2002). As already mentioned, there are numerous manifestations of psychological violence, but authors identified humiliation/degradation and controlling/dominance as behaviors that are especially harmful for victim's health (both mental and physical) and that these behaviors are strongly associated with physical violence (Bell et al., 2008; Bennett et al., 2000; Follingstad et al., 1990; Katz & Arias, 1999; Kelly, 2004). In summary, it can be said that psychological violence represents a risk factor for physical aggression (O'Leary, 1999) and precisely, a risk factor for both minor and severe physical injuries (Thompson et al., 2001).

Anomie

Durkheim (1984; as cited in Radetić Lovrić, 2011) is the author of the anomie and he suggested an explanation of collective consciousness which is much stronger than individual consciousness and its sums and which is considered important for understanding the concept of anomie in the explanation of socio-pathological behaviors. Collective consciousness enables the realization of social goals and establishes the socially acceptable behavior of an individual through the process of socializing and through the system of values in society, norms, collective ideas, opinions that exist in the social system and which are woven into customs, morality, law, religion (Radetić-Lovrić, 2011). As society and life circumstances change so does the collective consciousness. In cases where the collective consciousness is not able to continue to follow rapid social changes, that may lead to the fact that society has no control over the individual.

Furthermore, at some point, society finally loses prior regulatory function and social rules and norms about human behavior that is socially acceptable are modified. After all those changes, there is a lawlessness state in society that Durkheim calls anomie (Radetić-Lovrić, 2011). Anomie may manifest at both individual (as lack of exteriority and constraint) and social (as aggregation of the lack of exteriority and constraint) levels (Sârbu et al., 2022). An alienated person (from society or/and him/herself) may feel numerous unpleasant feelings such as: feeling different from everyone else, feeling distanced from work, family, and friends, feeling separate from everyone else, feeling that the world is empty or meaningless, feeling unsafe when interacting with others, having difficulty approaching and speaking with others, especially with parents, feeling hopeless and low self-esteem (Barclay & Moncivaiz, 2018; as cited in Sârbu et al., 2022). However, it should be noted that only certain individuals find a way out of anomie social situations in the world of social pathology. Such life circumstances can be unfavorable for the development of an individual and can lead to the creation of dissatisfaction in a person, which manifests itself through various psychological phenomena (alienation, loneliness, helplessness), and can even lead to some types of social pathology (the world of crime, using drugs and other socio-pathological phenomena). Therefore, anomie may generate certain social-psychological phenomena that are more directly related to social-pathological phenomena and that anomie in itself is not sufficient to cause social-pathological phenomena (Radetić-Lovrić, 2011).

One of the understandings of anomie is to conceptualize this phenomenon as a component of social alienation. Social alienation actually represents the state in which the person can be and whose characteristic is that the person may dissociate both from society and from himself, which can lead to the development of a psychological disorder (Erdner et al., 2005). A social system that is in a state of anomie may cause people to interpret the situation in which they find themselves in such a way that they are unable to have control over such a situation. Consequently, the state of anomie is conceptually close to the concept of an external locus of control, because people interpret the situation they are in as one that is beyond control and it is unlikely that they can change anything about their lives and about what happens to them (Rotter, 1966). A group of authors (Mihailović et al., 2004) examined the consequences of anomie social conditions in Serbia and they obtained results that present life in Serbia is determined and subordinated to the past and that can be discouraging for young people and their aspirations and desires with a future ahead of them.

Regarding the measurement of the possible effects that social anomie has on the manifestation of behavior that can be characterized as breaking the rules, Durkheim and Merton were pioneers in the research of these effects (Durkheim, 1951; Merton, 1968; as cited in Konty, 2005). The results of their studies indicated that the manifestation of deviant behavior is frequent in a state of social anomie, because such a state in which people live is extremely tense and difficult. Consequently, violent behavior then actually appears as some type of social-psychological mechanism that a person uses in order to cope with such conditions, to adapt to such conditions and that person usually does because of feelings of helplessness.

It has been shown that poverty, unexpected and rapid changes in social and economic status, as well as the experience of a high degree of instability and the difficulty of making decisions due to new life circumstances, may cause a person to experience a high level of stress, to the destabilization and disorganization of family relationships and to the appearance of violent behavior in the family (Nikolić-Ristanović, 2008; as cited in Opsenica Kostić et al., 2016). Some authors suggest that shame may be the key emotion of anomie for the person because it can arouse other emotions (for example: intense anger, sadness, feel of rejection...) and that may further lead to the possibility of violent behavior toward others and also against the self (Lansky, 1987; Scheff, 1997; as cited in TenHouten, 2016). There is some evidence that rapid changes in society tends to result in an increment of suicides, crime, and deviant behavior (Bjarnason et al., 2005; Thorlindsson & Bernburg, 2004), conflict and other forms of violence (Karimi & Jafari-Koshki, 2020). Also, in a study which examines the postwar former Yugoslavia context (Spini et al., 2019), authors obtained results that when local communities have been exposed to violence (generalized across different ethno-national groups), local communities powerfully criticize abuse of the human rights and results suggested that the relationship between generalized victimization and the abuse of human rights violations is mediated by a collective sense of anomie.

In the context of intimate partner violence, the majority of research has been focused on the women as victims of violence (and their mental health) and men as perpetrators of violence. There are limited number of studies that study women as perpetrators of violence and use of violence behaviors in other close relationships (not only in relationships with partners) (Bernardi & Steyn, 2019; Carney et al., 2007; Chen & White, 2004; Machado et al., 2020; Mackay et al., 2018; Venäläinen, 2017; Walker et al., 2020). Accordingly, the aim of this study was to examine the predictive power of the anomie and different dimensions of psychological violence in predicting physical violence in close relationships perpetrated by female adults.

Method

Sample and procedure

The sample was convenient and consisted of 341 female adults. The mean age of the respondents was 25.03 ($SD = 8.97$). Participants' ages ranged from 18 to 65 years.

Table 1
Sample structure by socio-demographic variables

Education	%	Relationship status	%	Satisfaction with material condition (income)	%
Finished secondary education	69.5%	Not in a relationship	40.5%	Very dissatisfied	4.1%

Finished higher school	1.5 %	Living in a cohabitation with their partner	12 %	Moderately dissatisfied	15.8 %
Bachelor's degree	18.8%	Married	8.8%	Neither satisfied nor dissatisfied	29.6%
Master's degree	10.3%	Divorced	1.8%	Moderately satisfied	36.4%
		Widows	0.9%	Very satisfied	14.1%
		In a relationship but not living with a partner	36.1%		

Respondents were recruited in part online and they filled out an online questionnaire ($n = 151$) (which was shared through social media and personal contacts), and the other part of the respondents participated using the paper and pencil method ($n = 202$). Research was conducted in the period from December 2022 to June 2023. The respondents who filled out the paper questionnaire were recruited at the Faculty of Philosophy in Niš, Serbia. Researchers asked students to fill a questionnaire after their exam was finished or before their lecture began. Participation in the research was completely anonymous and voluntary, and respondents received all necessary information for participating in the research. Within the battery of instruments, there was a one-item marker for checking the attention of the respondents (for checking the validity of the answers). Based on the answer to this item, 12 respondents were removed. The research was approved by the Ethics Committee of the Faculty of Philosophy in Niš (number 12-2022).

Data analysis

Statistical analyses were conducted using SPSS 20 and JASP 0.16.0.0 (JASP Team, 2022). Descriptive statistics for investigated variables were given in terms of means, standard deviations, range and skewness and kurtosis. The reliability of the scales was assessed using Cronbach's α and McDonald's omega coefficient. In order to determine the relationship between anomie, dimensions of psychological and physical violence, Pearson's correlation coefficients between the variables were calculated. Moreover, predictive power of age, anomie and dimensions of psychological violence in predicting dimensions of physical violence was assessed through hierarchical linear regression.

Instruments

Questionnaire of Violent Behavior among adults (VBQ; Kodžopeljić et al., 2014). The questionnaire is intended to self-assess the frequency of committing violent behavior by a person in the present or in the past toward different groups

of people (parents, siblings (or other household members), partner (husband/wife or boyfriend/girlfriend), friends/acquaintances/colleagues from work, and unknown persons). Respondents had the task of reading all the statements and choosing a number on a five-point Likert scale (the following meanings were added to the extreme values: 1 – *Never*; 5 – *Several times a week*) which is the most appropriate.

The original version of the questionnaire consists of 25 items, but for the purposes of this research, a version of 20 items was used. Precisely, items related to committing violent acts against unknown persons were omitted, and the reason for such a decision is reflected in the fact that this research examined committing violent acts in close relationships.

The items in the questionnaire are conceptualized in such a way that they measure five different forms of manifestation of violent behavior, which are ordered by the intensity of the violence: mocking and making rough jokes, machinations and plotting, insulting and threatening, light hitting, poking, pushing, beating with or without objects. These forms of violence can be further grouped into two superordinate categories: 1. Psychological/Emotional violence (indicators/dimensions: mocking and making rough jokes (direct verbal violence), machinations and plotting (indirect verbal violence) and insulting and threatening (direct verbal violence)); 2. Physical violence (indicators/dimensions: light hitting, poking, pushing, beating with or without objects). The scale showed mostly satisfying internal consistency reliability based on the present sample: mocking and making rough jokes ($\alpha = .784$; $\omega = .786$); machinations and plotting ($\alpha = .750$; $\omega = .753$); insulting and threatening ($\alpha = .653$; $\omega = .659$); light hitting, poking, pushing ($\alpha = .570$; $\omega = .587$); beating with or without objects ($\alpha = .434$; $\omega = .399$).

Perception of anomie scale (original instrument: McClosky & Shaar, 1965; translation and adaptation: Radetić-Lovrić, 2011). The scale is intended to measure a person's subjective experience that there are no more existing and accepted norms in society, which leads to a feeling of confusion regarding the norms that are now valid in society. Respondents had the task of evaluating their degree of agreement with given statements related to the world and society in which they live on a five-point Likert scale (the following meanings were added to the extreme values: 1 - *I do not agree at all*; 5 - *I completely agree*). The scale is unidimensional and consists of 9 items (example of an item: "Today the world is uncertain and anything can happen"). The scale shows satisfying internal consistency reliability based on the present sample ($\alpha = .833$; $\omega = .834$).

Results

Some basic descriptive statistics indicators are summarized and shown for all variables that were used in this research. Table 2 shows the descriptive indicators (range, means, standard deviations and measures the deviation of empirical distributions from normal) of the variables used in the research.

Table 2
Descriptive indicators

Variable	Min	Max	M	SD	Sk	Ku
Anomie	1.00	5.00	3.54	.78	-.31	-.18
Mocking and making rough jokes	1.00	5.00	1.90	.82	1.22	1.33
Machinations and plotting	1.00	3.75	1.24	.45	2.45	6.63
Insulting and threatening	1.00	4.25	1.45	.55	1.62	3.22
Light hitting, poking, pushing	1.00	3.75	1.45	.51	1.560	2.60
Beating with or without objects	1.00	2.25	1.04	.15	4.29	20.84

Furthermore, Pearson's correlation coefficients were calculated with the aim of examining the relationship between measures obtained on different dimensions of committing violent behavior and anomie (Table 3).

Table 3
Pearson correlations between the dimensions of violent behavior and social anomie

	1	2	3	4	5	6
1 Anomie	1	.03	.11	.08	.16**	.18**
2 Mocking and making rough jokes		1	.47**	.51**	.51**	.26**
3 Machinations and plotting			1	.53**	.40**	.34**
4 Insulting and threatening				1	.53**	.42**
5 Light hitting, poking, pushing					1	.45**
6 Beating with or without objects						1

Note: **p<.01, treba staviti razmak pre i posle znaka manje, p < .01

The obtained results indicate that the measures obtained on anomie are positively correlated with the dimensions of physical violence (light hitting, poking, pushing and beating with or without objects) of low intensity, while the measures obtained on anomie are not significantly correlated with the dimensions of psychological violence (mocking and making rough jokes, machinations and plotting and insulting and threatening) (Table 3). As regards for the correlation between the measures obtained on different dimensions of violent behavior, the obtained results indicate that these measures are significantly positively correlated and that the intensity of the correlations ranges from low to moderate. Based on the intensity of all shown correlations, it can be said that there is no high correlation between the measures obtained on the assumed predictor variables, that is, there is no multicollinearity, which is one of the conditions for conducting regression analysis.

Two hierarchical regression analyses were conducted. Before considering the obtained results of the hierarchical regression analysis, the VIF and Tolerance values were considered with the aim of checking whether these values indicate the existence of multicollinearity between the predictor variables. Based on the values of these parameters, it can be said that there is no multicollinearity (VIF < 10; Tolerance > .10; Senaviratna & Cooray, 2019).

Bearing in mind that there is an asymmetry regarding respondents' age, reflecting the young age structure, with the goal of statistical control of the variable age, this variable was included in the first step of the hierarchical regression analysis. First, the criterion variable was a perpetrated lower level of physical violence, light hitting, poking, pushing, and the predictor variables were anomie and the dimension of psychological violence (mocking and making rough jokes, machinations and plotting and insulting and threatening; Table 4).

Table 4

Results of the hierarchical linear regression: age, anomie and dimensions of the psychological violence as predictors of dimension light hitting, poking, pushing

Predictors	Model Summary	β	p	Tolerance	VIF
1 Age	$R = .06, R^2 = .00,$ Adjusted $R^2 = .00 F(1, 339) = 1.25, p = .264$	-.06	.264	1.00	1.00
2 Age Anomie	$R = .19, R^2 = .03,$ Adjusted $R^2 = .03, F(2, 338) = 6.12,$ $p = .002, \Delta R^2 = .03, \Delta F(1, 338) = 10.96, p = .001$	-.10 .18	.060 .001	.94 .94	1.06 1.06
3 Age Anomie Mocking and making rough jokes Machinations and plotting Insulting and threatening	$R = .61, R^2 = .37,$ Adjusted $R^2 = .36, F(5, 335) = 39.93, p = .000,$ $\Delta R^2 = .34, \Delta F(3, 335) = 60.31, p = .000$	-.04 .12 .29 .07 .33	.357 .006 .000 .158 .000	.89 .93 .64 .66 .62	1.12 1.07 1.55 1.51 1.61

The obtained results of the hierarchical regression analysis indicate that the first model, in which age was included, is not statistically significant; precisely, age is not a significant predictor in predicting light hitting, poking, pushing (Table 4). In the second step, anomie was included in the model as a potential predictor variable, and it was shown that the model conceptualized in this way is statistically significant as a whole. The obtained results indicate that the contribution of anomie in predicting the commission of light hitting, poking, pushing is significant with anomie as a significant predictor. In the third step, the dimensions of psychological violence were added and it was shown that the model is statistically significant as a whole. The obtained results indicate that the contribution of dimensions of psychological violence in predicting the commission of light hitting, poking, pushing is significant. Significant predictors within this model are anomie, mocking and making rough jokes and insulting and threatening. All significant predictors are positive predictors of light hitting, poking, pushing.

Results of hierarchical regression analysis with perpetrated severe form of physical violence (beating with or without objects) as a criterion, and anomie and the dimension of psychological violence (mocking and making rough jokes, machinations and plotting and insulting and threatening) as predictors were presented in Table 5.

Table 5

Results of the hierarchical linear regression: age, anomie and dimensions of the psychological violence as predictors of dimension Beating with or without objects

Predictors	Model Summary	β	p	Tolerance	VIF	
1 Age	$R = .16, R^2 = .03,$ Adjusted $R^2 = .02, F(1, 339) = 9.29, p = .002$.16	.002	1.00	1.00	
2 Anomie	$R = .22, R^2 = .05,$ Adjusted $R^2 = .04, F(2, 338) = 8.31, p = .000,$ $\Delta R^2 = .02, \Delta F(1, 338) = 7.16, p = .008$.13 .15	.019 .008	.94 .94	1.06 1.06	
3	Age Anomie Mocking and making rough jokes Machinations and plotting Insulting and threatening	$R = .48, R^2 = .23,$ Adjusted $R^2 = .22, F(5, 335) = 20.19, p = .000,$ $\Delta R^2 = .18, \Delta F(3, 335) = 26.84, p = .000$.15 .10 .06 .15 .29	.004 .044 .280 .012 .000	.89 .93 .64 .66 .62	1.12 1.07 1.55 1.51 1.61

The obtained results of the hierarchical regression analysis indicate that the first model, in which age was included, is statistically significant; precisely, age is a significant predictor in predicting beating with or without objects (Table 5). In the second step, anomie was included in the model as a potential predictor variable, and it was shown that the model conceptualized in this way is statistically significant as a whole. Anomie is a significant positive predictor in predicting a committing beating with or without objects and age remains a significant positive predictor. In the third step, the dimensions of psychological violence were added and it was shown that the model conceptualized in this way is statistically significant as a whole. The obtained results indicate that the contribution of dimensions of psychological violence in predicting the commission of beating with or without objects, is significant. Significant predictors within this model are age, anomie, machinations and plotting and insulting and threatening. All significant predictors are positive predictors of beating with or without objects.

Discussion

The main goal of this research was to examine the predictive power of anomie and different dimensions of psychological violence in predicting physical violence perpetrated in close relationships by female adults. Although the relationship between psychological and physical violence was proved by numerous studies (Baldry, 2003; Bell et al., 2008; Bennett et al., 2000; Dutton et al., 1996; Follingstad et al. 1990; Harned, 2002; Kelly, 2004; Lanza et al., 2006; McFarlane et al., 2002; Macmillan & Gartner, 1999; Murphy & O'Leary, 1989; Nedimović & Biro, 2011), there are almost no studies focused on female perpetrators. However, by reviewing the literature, it was noticed that there is a limited number of studies that have examined the relationship between anomie and the perpetration of physical and psychological violence, either by male or female perpetrators.

First of all, because it was established that there is an asymmetry of respondents' age, reflecting the young age structure, age was included in the hierarchical regression analysis. Based on the obtained results it can be said that age is a significant predictor only of severe forms of perpetrated physical violence - beating with or without objects. Such a result indicates that the frequency of occurrence of perpetrated physical violence increases with age. Furthermore, the result of this study refers to the predicted probability of intimate partner violence perpetration which was higher for female youth beginning at age 17 and continuing to 28 years (oldest observed age in this study; Johnson et al., 2015). A larger number of studies have been conducted that have considered the relationship between experiencing violence in a partner relationship (not perpetration) and the age of adolescents and it has been confirmed that the likelihood of experiencing violence in a partner relationship increases with a higher number of their years (Malik et al., 1997; Spriggs et al., 2009; Vives-Cases et al., 2021; as cited in Janković, 2023). Bearing in mind that there is an asymmetry of respondents' age, reflecting the young age structure, it can be said that our results are consistent with the results of the previously mentioned study. In a prospective longitudinal study that explores adolescent and young adult development, obtained results indicated that age had no significant effect on intimate partner violence (experienced and perpetrated) among both women and men (Chen & White, 2004). This result is somewhat in line with the obtained results within the current study, considering that age is not a predictor of light hitting, poking, pushing, but it is of beating with or without objects. Conversely, there are also results from studies conducted in previous research that are not in agreement with the findings obtained within the current study. In some previously conducted studies, it has been shown that age was negatively correlated with the physical violence variables among adults (both women and men and both experienced and perpetrated violence), indicating that younger respondents tended to report more physical violence than older respondents (Kwong et al., 2003). Age was also negatively correlated with physical violence among women who have experienced physical violence in a partner relationship by a man (Abramsky et al., 2011; Mezey et al., 2002).

The hypothesis was that anomie will be a significant predictor of physical violence in close relationships among female adults. Precisely, it was assumed that anomie will be a significant predictor of dimensions of committed physical violence (light hitting, poking, pushing and beating with or without objects). Based on the obtained results it can be said that this hypothesis is confirmed because anomie is a significant positive predictor of both dimensions of committed physical violence: light hitting, poking, pushing and beating with or without objects. As an explanation for the result obtained in this study, it can be said that if the life circumstances of a person and the society in which person lives are such that they can lead to the feelings of insecurity about the present and the future, as well as dissatisfaction, this can further lead to reacting with the use of violent behavior (Radetić-Lovrić, 2011). Therefore, as a response to the subjective experience of powerlessness, dissatisfaction and insecurity, which is associated with the climate within a society characterized by extreme tension, which is difficult and in which rapid changes take place, violent behavior is manifested, which is in accordance with some results obtained in previous studies (Durkheim, 1951; Merton, 1968; as cited in Konty, 2005; Nikolić-Ristanović, 2008; as cited in Opsenica Kostić et al., 2016; Karimi & Jafari-Koshki, 2020). In the context of this study, it is shown that people who have a subjective feeling of alienation from the world, insecurity about what to do and how to behave, inability to keep up with changes within the society in which a person lives, are more prone to commit both lower and severe forms of physical violence. Therefore, a woman can, in her close relationships, manifest hitting, poking, pushing or beating with or without objects with the goal of somehow facing the situation that she is in and thus adapting to the conditions in which she is. Bearing in mind the mentioned fact that there are limited number of studies that have examined the relationship between anomie and the perpetration of both physical and psychological violence, the importance and significance of this work can be reflected in the fact that this study gains insight into the relationship between these constructs and that obtained results indicate that by anomie we can predict committed physical violence among females.

It was further assumed that committed psychological violence will be a significant predictor of committed physical violence in close relationships among adult females. Precisely, it was assumed that dimensions of committed psychological violence (mocking and making rough jokes, machinations and plotting and insulting and threatening) will be significant predictors of dimensions of committed physical violence (light hitting, poking, pushing and beating with or without objects). These assumptions are partially confirmed. Specifically, mocking and making rough jokes and insulting and threatening are significant predictors, but machinations and plotting are not significant predictors of light hitting, poking and pushing. Therefore, use of direct verbal violence can predict lower levels of physical violence committed by female adults. Furthermore, machinations and plotting and insulting and threatening are significant predictors, but mocking and making rough jokes is not a significant predictor of beating with or without objects. Accordingly, psychological violence is a significant predictor of physical violence in close relationships which is consistent

with some results from some previous studies (Dutton et al., 1996; Harned, 2002; Macmillan & Gartner, 1999; Murphy & O'Leary, 1989) and with results that suggested that psychological types of violence can precede or follow or co-occur with physical types of violence (Lukić & Jovanović, 2003; Nedimović & Biro, 2011; Stets, 1991). Furthermore, the obtained results suggest that psychological and physical violence were related which is consistent with some results obtained in some other studies (Greenfield & Marks, 2010), but we obtained results that suggest that these two types are low correlated which is not consistent with some obtained results that suggested that these two types of violence were highly correlated (Baldry, 2003; Hoffman et al. 1994; Jewkes et al., 2002). Some authors suggested that verbal abuse has a reactive characteristic (Kodžopeljić et al., 2014). Bearing this in mind as well as results from some studies about intimate partner violence, women use violence with a goal of self-defense or as a response to their partner's abuse pattern (Dasgupta, 2002; Dobash & Dobash, 2004; Swan & Snow, 2006; Worcester, 2002), to protect themselves and their children or in retaliation to being victimized (Chen & White, 2004; Dasgupta, 2002; Hamberger & Guse, 2002; Kimmel, 2002). Also, as an explanation for the obtained results in this study, it can be said that usually, people who use these forms of direct verbal violence tend to use hostile polemical behavior in which the interlocutor is often insulted, they have poor impulse control (Kodžopeljić et al., 2014) and this may escalate to the use of physical violence. It can be concluded that the results of this research show that psychological violence can be a risk factor for physical aggression, both for minor and serious physical injuries (O'Leary, 1999; Thompson et al., 2001).

Regarding the practical implications of the research findings, based on the obtained results, it is possible to develop and implement interventions/treatments that would take into account the fact that women can also be perpetrators of violence in close relationships. Furthermore, the obtained results can be useful for raising awareness in the media and society in general, considering that it has been shown that women also use both physical and psychological violence in their close relationships, alongside men who are more commonly associated with perpetrating violence. Some authors have suggested that studying violence in intimate relationships can lead to a richer understanding of how violence is perceived, and this knowledge can be translated into media literacy training to attempt to change assumptions that enable and sustain a culture and society where violence is widespread (Duran et al., 2008; as cited in Scarduzio, 2017). In addition, the results of this study provide insight into the variables related to the perpetration of physical violence and their dynamics, and can potentially be useful to psychotherapists and counselors in working with persons who are victims of violence in close relationships. Also, it is important to take measures to reduce anomie in a given society, given that the results show that anomie is a significant predictor of physical violence. This would mean that prevention programs and campaigns should be designed with the aim of strengthening solidarity, empathy and closeness between people.

There are a few limitations of this study. It is possible that some respondents gave socially desirable answers and therefore there is a limited range and low variability of

measures. Furthermore, reliability analysis showed unsatisfying internal consistency for some of the dimensions within the questionnaire that measures violent behavior (Insulting and threatening; Light hitting, poking, pushing; Beating with or without objects) so the obtained results should be considered and interpreted with a dose of caution. Therefore, there is a need for additional verification of the obtained results by future researchers. Also, the recommendation to future researchers is that it would be useful to consider the obtained results in the context of sex differences because the current sample did not allow us to do so. Furthermore, it would be useful for future researchers to examine and include in the predictor model some variables, such as whether the woman has experienced violence in close relationships (both with a partner and with parents, friends, colleagues). Variables that operationalize mental health (for example, anxiety, depression, stress, somatic symptoms) would also be beneficial to incorporate into the predictor model. Additionally, including variables related to personal characteristics that could be associated with the perpetration of violence (for example, self-esteem, neuroticism, impulsivity, empathy) would be valuable. Furthermore, it would be useful to obtain data related to the reasons for committing violence, whether they consume alcohol and/or any type of drug.

Conclusion

We can conclude that the obtained results within this study indicate that it is possible to predict the occurrence of physical violence in close relationships by women based on psychological violence and anomie. The results show that the subjective experience of powerlessness, dissatisfaction and insecurity, which is associated with the climate within a society, can be important in predicting physical violence in close relationships. The relationships between psychological and physical violence obtained within the framework of this study are similar to those obtained in some previous studies (when examining either male or female perpetrators of violence in close relationships) (e.g., Baldry, 2003; Jewkes et al., 2002; Lanza et al., 2006; Lukic & Jovanovic, 2003; Nedimovic & Biro, 2011). Additionally, within this study, it has been shown that based on the dimensions of committed psychological violence, it is possible to predict the occurrence of physical violence carried out by women, which is consistent with findings from previous studies that mainly explored predictive patterns within samples of male perpetrators of violence (e.g., Dutton et al., 1996; Harned, 2002; Macmillan & Gartner, 1999; Murphy & O'Leary, 1989; McFarlane et al., 2002). Thus, we can conclude that when considering the possibility of predicting committed physical violence based on committed psychological violence, whether by men or women, the results are consistent, indicating the potential to predict physical violence based on psychological violence.

As already mentioned in the introduction of the paper, there are different study results indicating that women commit physical violence more frequently (Archer, 2000), that women were similar to men in terms of their use of severe violence, inflicting severe injuries on their partners (Busch & Rosenberg, 2004), that

the rate of committed physical violence in intimate relationships is similar among both men and women (Carney et al., 2007; Desmarais et al., 2012), and that, in a broader context, perpetrating physical violence in intimate relationships represents a serious social issue (Desmarais et al., 2012). Furthermore, some authors have discovered that the female perpetrators of domestic violence share many of the same demographic characteristics as the men in terms of childhood experiences, exposure to interparental conflict, mental health history (Henning et al., 2003), experiences of complex trauma (Flemke et al., 2014) and that they have similar motives and psycho-social characteristics such as prior aggression, substance use and personality disturbance (Carney et al., 2007). Therefore, in order to better understand the dynamics of violence in close relationships, as well as differences in the perpetration of violence between men and women, it is important to consider a number of different predictors. Only some of them were considered in this research.

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Anomija i počinjeno psihičko nasilje kao prediktori počinjenog fizičkog nasilja u bliskim vezama od strane odraslih žena

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Apstrakt

Opšti cilj istraživanja bio je ispitati da li se činjenje fizičkog nasilja u bliskim vezama od strane žena može ispitati na osnovu anomije i počinjenog psihičkog nasilja. Uzorak je činilo 341 osoba ženskog pola, starosti od 18 do 65 godina ($M = 25.04$; $SD = 8.97$). Anomija je bila operacionalizovana preko skora na Skali za ispitivanje anomije. Počinjeno psihičko i fizičko nasilje je operacionalizovano preko skorova na Upitniku nasilnog ponašanja (UNP; dimenzije: ismevanje i pravljenje grubih šala, spletkarenje ili kovanje zavere i vređanje i pretnje (psihičko nasilje); laksće udaranje, čuškanje, odgurivanje i teža tuča sa ili bez upotrebe oružja (fizičko nasilje)). Sprovedene su dve hijerarhijske regresione analize. Prvi model se sastojao od varijable starost, u drugom koraku je uključena anomija, a u trećem dimenzije psihološkog nasilja. Rezultati ukazuju da je model značajan u predikciji lakšeg udaranja, čuškanja, odgurivanja ($R^2 = .37$, $F_{(5,335)} = 39.93$, $p < .001$), a kao značajni prediktori izdvajaju se anomija ($\beta = .12$, $p = .006$), ismevanje i pravljenje grubih šala ($\beta = .29$, $p < .001$) i vređanje i pretnje ($\beta = .33$, $p < .001$). Takođe, model je značajan u predikciji teže tuče sa ili bez upotrebe oružja ($R^2 = .23$, $F_{(5,335)} = 20.19$, $p < .001$), a kao značajni prediktori izdvajaju starost ($\beta = .15$, $p = .004$), anomija ($\beta = .10$, $p = .044$), spletkarenje ili kovanje zavere ($\beta = .15$, $p = .012$) i vređanje i pretnje ($\beta = .29$, $p < .001$). Dobijeni rezultati ukazuju na međusobnu povezanost različitih oblika nasilnog ponašanja. Pored toga, oni ukazuju i na važnost razumevanja šireg društvenog konteksta u prevđviđanju nasilnog ponašanja, s obzirom na to da je lični doživljaj otuđenosti od društva povezan sa društvenim kontekstom i uslovima u kojima pojedinac živi.

Ključne reči: anomija, psihičko nasilje, fizičko nasilje, bliske veze, žene

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Possibilities of Application of Musical Interventions^{1*}

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Abstract

Throughout human history, music has been an important tool contributing to both the expression of feelings and healing. Today, its application is quite wide in both non-clinical and clinical populations. The subject of the paper is a presentation of the history, development, and definitions of music as an intervention, music therapy, and the benefits of its application in children, adolescents, the geriatric population, stress reduction, psychotherapy, the treatment of neurological disorders, and pain therapy. In order to analyze the benefits of applying music as an intervention, a literature review was done. In addition, musical interventions were divided into diagnostic and preventive. It can be concluded that with the established research and clinical paradigms and taking into account the limitations of previous studies, a scientific basis for further academic research is provided. Additional guidelines for more intensive and beneficial incorporation of musical interventions in the previously mentioned areas were provided.

Keywords: musical interventions, children, adolescents, geriatrics, therapy

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Possibilities of Application of Musical Interventions

Musical interventions are used in different situations and in different ways to help psychological stability and a better balance of mental health in both non-clinical and clinical populations (Hurt-Thaut, 2016; Tricard et al., 2018). The goal of this paper is to familiarize the professional and wider social community with the benefits of applying music in various areas of everyday life. Moreover, the goal is to bring attention to this area, to work on improving its scientific basis, as well as wider application for therapeutic and non-therapeutic purposes. This paper will provide some important insights into the general description of the phenomena, along with its historical and developmental dimensions.

Musical interventions are deployed to four major fields. First, the benefits of musical interventions in working with children and adolescents. Second, musical interventions in working with the geriatric population. Third, the role of music in stress reduction through the effects of soothing and stimulating music. Finally, musical interventions in clinical practice, such as rehabilitation of neurological patients or musical interventions in pain therapy. Reflections regarding the further development tendencies of this type of intervention within different groups of people and psychotherapy will be enclosed. Concluding considerations resulting from all of the above, likewise.

History and development of music as an intervention

Music has always been a medium for expressing emotions and experiences since ancient times (Gardner-Gordon, 1993). Back in primitive Indian culture, music was highly valued and recognized as a means of healing since Vedic times. Within the well-known school of medicine, Ayurveda, there was a doctrine that doshas (doshas - three energy forces governing the human body and mind in ancient Indian medicine) such as vata, pitta, and kapha (wind, fire, and a combination of water and earth) could be modulated through music therapy and Ragas (Indian classical music). In the Indian system of music, they are believed to act on specific chakras or energy centers to bring harmony to the body and consequent healing (Gardner-Gordon, 1993). Music and healing were deeply embedded in group activities and were close to everyone, as were other daily rituals (Solanki et al., 2013). Historical records from different cultures indicate great similarities with Indian culture regarding the understanding of music as an important healing method (Horden, 2000; Pratt & Jones, 1987; Wigram et al., 2002). Also, back in the time of the Ancient Greeks, music was believed to have a relaxing effect on people suffering from mental disorders. In addition, many influential Western philosophers agreed that music can bring harmony to the body and spirit and that it is of great practical and curative importance (Wigram et al., 2002). In the post-World War II era, music was considered an important adjunct to standard therapy because it could facilitate and speed up the recovery of injured

soldiers. At this time, music begins to take its place in initiating what is considered therapy in medical settings (Chiu, 2003). In many Western countries, musical interventions have emerged, since then, as a branch of alternative medicine, with a wide therapeutic spectrum of action, including diseases and disorders such as Alzheimer's disease, cardiovascular disease, substance abuse, autism, AIDS, a wide range of psychiatric disorders - from anxiety to schizophrenia, trauma treatment, etc. (Solanki et al., 2013). Of course, the development of musical interventions cannot be imagined without understanding the development of the psychology of music.

The modern branch of music psychology has its own history, the beginning of which is linked to the last decade of the 19th century within research laboratories, especially in Germany and the USA. Music was viewed as a purely objective phenomenon, which found its place in the research of perception, i.e., measurements of people's reaction time to this type of stimulus. In the 20s and 30s of the 19th century, interest in the study of music began, not only as a purely objective phenomenon but also as one of the components of perception (Wigram et al., 2002). Of course, the development of music research in the field of psychology was influenced by various theoretical directions, such as Gestalt, behaviorism, psychoanalysis (Denmark and European countries), and ego-psychology. Also, more recently, there has been a growing interest from European cognitivist schools that wanted to deal with music. Today, it is precisely the cognitive paradigm that is the most dominant school that defines musical interventions within music therapy (Wigram et al., 2002).

Additional considerations and research are necessary to systematically study the application of music and its possible role as a therapeutic modality in the field of mental health. Also, the definitions of musical interventions differ depending on the context of their application, and the way in which they are perceived.

Definitions of musical interventions

One definition emphasizes "the controlled use of music and its influence for the purpose of promoting the psychological, physiological and emotional integration of a person during the treatment" (Johnston & Rohaly-Davis, 1996, p. 55). Another definition regards musical interventions for therapeutic purposes as a "behavioral science that deals with specific genres of music, as well as the specific possibilities of those genres to produce changes at different levels of a person's functioning, including behavioral, emotional, and physiological" (Watkins, 1997, p. 44). It can be stated that both definitions emphasize the importance of controlled and adapted application of music in order to achieve changes on an emotional, behavioral, and physiological level in people who need it. However, the most professional and scientifically supported form of musical intervention is music therapy, which is defined as the use of music and/or musical elements (sound, rhythm, melody, and harmony) by a qualified music therapist with a client or group, in a process designed to encourage and promote communication, relationships, learning, expression, organization and other relevant therapeutic goals to meet physical, emotional, mental, social and cognitive needs. Music therapy aims

to develop the potentials and/or restore the functions of the individual so that he or she can achieve better intra- and interpersonal integration and, consequently, a better quality of life through prevention, rehabilitation or treatment (World Federation of Music Therapy, 1996, p.1).

Robb et al. (2018) consider that musical interventions are difficult to describe due to the diversity of musical experiences (receptive music listening, active music making), the complexity of musical stimuli (e.g., tempo, harmonic structure, rhythm, pitch, etc.) and other factors characteristic of them. In investigating how various authors describe music interventions, Robb and Carpenter (2009) found significant gaps that hinder cross-study comparisons, generalization, and integration of findings for practical purposes. One of the significant steps toward clarification in this area is developing *Reporting Guidelines for Music-based Interventions* (Robb et al, 2011). This guide specifies seven components of music interventions - Intervention Theory, Intervention Content, Intervention Delivery Schedule, Interventionist, Treatment Fidelity, Setting, and Unit of Delivery. These components encourage authors to discuss and report on them as a significant contribution to further research in this area. The aforementioned is a framework for a generalized definition of the concept of musical interventions.

In addition, Robb et al. (2018) defined music interventions, within health care, as “the use of music to manage symptoms, improve quality of life, promote physical and/or psychosocial function, and/or promote well-being (including spirituality) in patients with chronic or acute medical conditions”(pp. 7-8).

The term “music therapy intervention” or “music therapy” has often been mistakenly used as a blanket name for all music interventions (Bradt et al., 2016; Lee, 2016). Namely, the term “music therapy” refers to a professionally trained individual who applies musical intervention. It is understood here that he is an accredited music therapist. Also, the term music therapy should not be used to describe interventions administered by healthcare professionals who are not trained in the administration of music therapy. This term can be problematic because it provides limited information about music intervention. Therefore, it is necessary to establish definitions and standard terms in order to improve interprofessional cooperation, through a joint effort (Robb et al., 2018).

After considering the history and clarifying terminological doubts when it comes to musical interventions and music therapy, it is very important to emphasize the applied methods and strategies in the work on this topic. To conclude, the selection of applied methods and strategies in music therapy should be in compliance with individual needs.

Search methods and strategies

By searching Google Scholar, which is an inexhaustible and diverse source of scientific articles and written literature, sixty-eight articles and literary works were selected that are in accordance with the aims and topics of the paper: to

increase interest in this area, to work on improving its scientific basis, as well as a wider application for therapeutic and non-therapeutic purposes. Consequently, a wider period of published research was covered (1993 - 2023) in order to obtain a comprehensive insight into how these themes are represented throughout the history, development, and application of music interventions and music therapy. Relevant data from selected sources, information about the magazine, book, authors, and terminology were extracted and modeled in this paper, rendering the benefits of musical interventions.

When considering the search strategies, it can be pointed out that the search terms, within the aforementioned database, were “music”, “musical interventions”, “music therapy”, “adolescents”, “geriatrics”, and “pain therapy”. The criteria for this review are: database search in English and Serbian, clinical and non-clinical human trials, review of meta-analytic reports, observational studies, and journal articles. Meta-analytic reports impose limitations such as the insufficient number of participants or methodological problems. Moreover, these reports are solely reviews of previously conducted research. In addition, it should be emphasized that this review is designed to connect different areas of the music application, to show its effectiveness, and to indicate its importance for both therapeutic and non-therapeutic purposes.

Also, the structure of this paper is based on the division of musical interventions as:

1. diagnostic tool
2. preventive tool
3. intervention tool.

In accordance with this division and different age categories, it can be stated that musical interventions in working with children have the role of both preventive and interventional means. This can be seen through the educational, rehabilitation, and development target area, which is elaborated on in the next part of the paper.

Musical interventions in working with children

Namely, approximately a quarter of certified music therapists work with the child population that has developmental and intellectual disabilities as well as disabilities from the autism spectrum (Hurt-Thaut, 2016). In these children, music therapy identifies three target areas to increase motor, cognitive, social, communication, emotional, and musical functioning (Hurt-Thaut, 2016).

1. Educational goals are aimed at the academic development of the child. These goals may focus on social, cognitive, or physical skills (performing creative movements to music, practicing social skills while participating in group play, etc.; Hurt-Thaut, 2016). For example, the results of certain research indicate that music can have a positive role in improving attention, encoding of information and thinking, as part of the learning process, as well as in promoting positive emotional states (Tricard et al., 2018), higher levels of motivation, concentration, and interest

(Ramdane et al., 2018) that promote learning at primary school age. Music contributes to reducing negative emotional states such as depression and anxiety in children (Su et al., 2017). This contribution can be connected with educational content (otherwise known as special didactic knowledge), such as deductive reasoning (Tricard et al., 2018), creativity (Teske et al., 2017), graphic representation (Venegas et al., 2013), and reading (Su et al., 2017).

2. Rehabilitation goals are directed toward restorative or compensatory strategies to improve movement, breathing, posture, and sensory perception (use of rhythmic auditory stimulation, etc.; Hurt-Thaut, 2016). In a study involving children with cerebral palsy, ages 5 to 11, it was found that the use of percussion instruments can be very useful for improving gross and fine motor skills, as well as better hand-eye coordination. The use of musical instruments leads to the improvement of speech abilities and mobility. Thus, music therapy can contribute to the rehabilitation of coordination, communication, and social skills, as well as emotional status in children with cerebral palsy (Yun et al., 2013).

3. Developmental goals aim to promote the normal development of the child, providing normal social, emotional, and sensorimotor experiences through music (teaching the child how to play a musical instrument, etc.; Hurt-Thaut, 2016).

Social-emotional learning (SEL) is a topic of increasing focus in the education sector. SEL is the process by which children acquire the knowledge, skills, and attitudes to effectively recognize and manage emotions, formulate positive goals, feel empathy for others, and establish and maintain functioning social relationships. It develops to make responsible decisions, determine students' successful academic performance, transformation into adulthood, useful work, a good quality of life, and well-being. By the end of the 20th century the educational role of music has come into the spotlight, and in addition to the impact of music on the development of general skills, its social and emotional effects are also the subject of research (Váradi, 2022).

Through a search of 29 different studies, it was observed that there is considerable heterogeneity of models regarding the use of music interventions and instrumental and non-instrumental methods for assessing executive functions (Rodríguez-Gómez & Talero-Gutiérrez, 2022). There is evidence that musical training contributes to the development of executive functions and improves the performance of executive functions in children. Through the given search, it was found that the available evidence points to the beneficial influence of musical training on the development of executive functions, such as inhibitory control, working memory, and cognitive flexibility (Rodríguez-Gómez & Talero-Gutiérrez, 2022). Music improves executive functions and activates multiple cortical and subcortical brain areas. They include the prefrontal cortex which is linked to executive functions (Särkämö et al., 2014). Some studies evaluating music education among preschool children have identified a significant effect on executive functions compared to older children. This could be explained by maturational and neurodevelopmental processes that contribute to younger children being more susceptible to the effects of musical training (Rauscher

& Hinton, 2006). Additionally, a review of studies concluded that active music interventions are more strongly associated with the development of executive functions in older children. It is interesting to note that the interventions in preschool were mostly non-instrumental, but despite this, the effect on the development of cognitive functions was noted. It is certainly necessary to conduct additional research on the topic of the impact of music on cognitive development since the obtained results reflect the complexity of music education and its impact on executive functions (Rodríguez-Gómez & Talero-Gutiérrez, 2022).

The previous consideration is logically followed by consideration of the convenience of musical interventions at the adolescent age, where they have the role of diagnostic, preventive, and interventional means, and this will be considered through the subjective and physiological effects of listening to music in adolescents.

Musical interventions in adolescents

It should be noted that most adolescents have experienced significant stress during early adolescence (Cierpka & Seiffge-Krenke, 2009). However, music is a common source of relaxation for young people (Wells & Hakanen, 1991). However, relatively few studies have empirically tested the effectiveness of music in this age group. At the Second PAM-IE International Conference in Belgrade (2022), research was presented (Ala-Ruona et al., 2022) in which 26 adolescents from Finland participated. They were exposed to two individual relaxation sessions of 20 minutes each: one with relaxing music of their choice and the other without music while reading a magazine. Subjective reports of valence, arousal, and tension were collected using visual analog scales in a questionnaire before and after each session, and heart rate variability was measured throughout the experiment. The participants reported on the music in free form. The experiment was repeated, after one year, with the same subjects in order to check the consistency of the results. The analysis showed a significant increase in valence for both conditions and ages and a decrease in music-related tension in both ages. Also, subjects felt significantly less tense after the Music session compared to the non-Music session in the second year and the results remained consistent across both years. The results of the music analysis indicate that there are no specific genres that promote a stronger or weaker relaxation response, but a variety of genres and more detailed musical descriptions are associated with a stronger relaxation response, indicating that a stronger personal relationship to music can lead to better relaxation results with music. Further research combining physiological and personal reports is necessary to complete knowledge in this domain (Ala-Ruona et al., 2022).

Also, Freitas et al. (2022) in their study started from the fact that adolescence is a period in which psychiatric disorders can appear, on the one hand, and on the other hand, music is an intervention that encourages young people because it

promotes emotional regulation, identity formation, and interpersonal relationships. The method used was a strategic search of scientific databases Medline, Ovid, and Cochrane Library by typing the terms: “music therapy”, “adolescents”, “psychiatry” and “psychology”. As a result, 142 sources were found, out of which 9 papers related to music therapy were published, and the total number of respondents was 651. Music therapy was shown to improve engagement in society and self-esteem and reduce symptoms of anxiety and depression and social isolation in psychiatric adolescents. However, better quality research is needed in order to make music interventions more widely used when it comes to the mental health of young people.

In contrast to the previous two age categories within which musical interventions were interwoven with diagnostic, preventive, and interventional roles, the interventional role discussed in the following text is the most represented in the geriatric population.

Musical interventions in the geriatric population

This type of music intervention achieves great success in the geriatric population and is used in hospitals, nursing homes, home care, psychiatric facilities, and wellness programs to address problems with cognitive, sensorimotor, speech and language, and psychosocial skills (Hurt-Thaut, 2016). Older people often experience a decline in activity levels due to mobility difficulties, lack of motivation, or even lack of transportation. Lack of exercise can contribute to lower energy levels and heart disease and increase the risk of falls in older people. Brain imaging studies have also demonstrated that music generates a neural activity that affects the dynamics of brain activities in many cortical and subcortical areas pertaining to attention, memory, motor functions, semantic and music-syntactic processing, as well as areas related to emotions such as limbic and paralimbic regions (Koelsch et al., 2006).

Music combined with group exercises can be a very effective tool for increasing motivation, improving coordination, and improving fitness as well as improving social communication (Hurt-Thaut, 2016).

Also, Basu (2023) conducted a study that aimed to investigate how music as a therapeutic tool can be used to improve memory functions in the elderly without cognitive impairment. It used a randomized controlled pre-post design on a sample of 80 subjects aged 60 to 80 years, using *Indian Classical Raga* music. Subjects were randomly divided into control and intervention groups after a mental state examination to exclude subjects with cognitive impairment. During three months, the intervention group received two-week individual music therapy interventions. Baseline assessments were performed before the start of the intervention, and after the end of the intervention, post-intervention assessments of working and episodic memory were conducted. It was found that musical interventions contributed to the improvement of memory functions in this age group, which may contribute to the

improvement of their quality of life. However, more extensive research on a larger sample as well as research on the application of different music therapy interventions is needed to further confirm the obtained results.

It is interesting to supplement the previous discussions of music interventions according to the type of role, in different age categories, by considering the intervention effects of music on stress reduction depending on musical preferences.

Personalized musical interventions that alleviate the symptoms of stress and anxiety

When considering many physical and psychological disorders, it is well known that stress is considered to be one of the causative factors (Elliott et al., 2011). Excessive and long-term exposure to stress can lead to various types of emotional disorders and psychosomatic diseases, such as heart disease, high blood pressure, and anxiety disorders (Elliott et al., 2011). The main goal of music therapy is stress reduction (Elliott et al., 2011). There is an implicit consensus that music, like language, has the ability to convey or express emotions (Collier, 2007; Juslin & Laukka, 2004; Viillard et al., 2008), but also to influence them (Hunter et al., 2010; Jibia et al., 2008). Numerous studies (Chafin et al., 2004; Yehuda, 2011) indicate that listening to music can be effective in relieving tension and anxiety. Conversely, not every type of music is suitable for stress reduction (Chafin et al., 2004; Yehuda, 2011). Music selection is, accordingly, very important in music therapy (Elliott et al., 2011; Pelletier, 2004). In the past few decades, there has been a growing interest in the use of music for stress reduction purposes. Some studies compare the effects of different music genres on stress reduction and suggest that classical music has greater effects on stress reduction, compared to hard-rock and heavy metal music (Burns et al., 2002; Labbé et al., 2007). However, no statistically significant differences were found between classical, jazz, and pop music in terms of reducing the level of tension and state of anxiety (Chafin et al., 2004). Music is classified as soothing and stimulating in terms of the level of arousal it induces. Stimulating music is most often defined by fast tempo, loudness, and rhythmic patterns, while soothing music is slow, and gentle with little rhythmic activity (Iwanaga et al., 1996; Pellitteri, 2009). Listening to soothing music and sitting in silence reduce tension more than exposure to noise or stimulating music (Hasegawa et al., 2003; Iwanaga et al.; 2005, Lingham & Theorell, 2009). Participants who listened to soothing music reported lower levels of state anxiety as opposed to those who listened and sat in silence (Hasegawa et al., 2003; Knight & Rickard, 2001). Nonetheless, Stratton and Zalanowski (1984) observed no significant differences in relaxation levels between listening to soothing music, stimulating music, and sitting in silence. Musical taste is also considered an important factor in music's potential to alter moods (Schäfer & Sedlmeier, 2009; Wheeler, 1985). For example, one study studied the effects of soothing and stimulating music and musical taste on stress reduction when participants were exposed to a stressor. One hundred and forty-four female

students from the music academy were exposed to a mental arithmetic stress test. After the stress was successfully induced, the participants were randomly assigned to four experimental groups. They listened to preferred stimulating music, preferred soothing music, non-preferred stimulating, and non-preferred soothing music. After that, measures of tension and state of anxiety were collected. The results revealed that participants who listened to soothing music showed lower levels of stress and anxiety compared to those who listened to stimulating music when it was non-preferred. However, there was no statistically significant difference in measures of tension and state anxiety between listening to soothing and stimulating music when preferences for one type and the other were expressed. These findings demonstrate that the stress-reducing effects of soothing and stimulating music depend on musical taste. This study has important implications for the clinical application of music treatment, as it provides strong evidence for the use of preferred music for stress reduction purposes (Jiang et al., 2013).

More recent research (Lecamwasam et al., 2023), among other things, deals with research into the psychological and physiological effects of an interactive music interface for reducing anxiety and stress. In this research, the group of authors aimed to examine the use of personalized music as a musical intervention for anxiety control. They created an interface with fourteen musical fragments with adapted rhythm, tempo, and instrumentation with the aim of positively influencing the effect. They also allowed the respondents to move freely. In addition, in order to test the effectiveness of this approach, a pilot study was conducted, and through a survey and biometric data, it was determined that this approach effectively reduces stress when it enables respondents to personalize their musical stimuli. Based on this, it can be concluded that it is necessary to carry out research on a larger scale so that personalized musical interventions that alleviate the symptoms of stress and anxiety are available to a wider population (Lecamwasam et al., 2023).

In addition to the mentioned interventional role in stress reduction, it is important to mention the interventional role of musical interventions in connection with neurological disorders and pain therapy because these are the three most common areas of application. Also, in connection with that, in the next part of the text, Neurological Music Therapy (NMT), Anxiolytic Music (AAM), and Rhythmic Auditory Stimulation (RAS) will be presented.

The significance of musical interventions at younger and older ages in relation to neurological disorders and pain therapy

When we consider the use of music in the treatment of neurological disorders in different age groups, we can state that this field is strongly supported by basic science and clinical research coming from scientists inside and outside the field of music therapy since the mid-1990s. Advanced training in Neurological Music Therapy (NMT) is highly recommended for therapists when working with this population due to familiarity with brain pathology, medical terminology, and neuroanatomy. NMT is a scientifically based system of standardized clinical

techniques for sensorimotor training, speech and language training, and cognitive training in neurological disorders such as Parkinson's disease, stroke, traumatic brain injury, multiple sclerosis, autism, Alzheimer's disease, cerebral palsy, developmental disorder, intellectual disabilities, spinal cord injuries (Hurt-Thaut, 2016).

For example, Alzheimer's dementia, which belongs to the group of cortical dementias, is a progressive neurodegenerative disease of the central nervous system. The most striking symptom that characterizes the onset of the disease is episodic memory disorder. As the disease progresses, there are disturbances in speech functions, cognition, praxis (voluntary movements), and executive functions (allowing us to control, implement, maintain, correct, and implement a plan; Brinar et al., 2009).

Various therapeutic roles of music in dementia are to awaken emotions and associations that have been forgotten, to re-access feelings, memories and thoughts, and to use music as a mnemonic tool, as it helps to evoke memories (Sacks, 2007). It is also about trying to preserve the patient's surviving self and strengthen and preserve musical powers.

Music therapy includes the performance of old songs, specific melodies, and content, and the goal is to stimulate personal memories, reactions, and participation of the patient with dementia in this way (Sacks, 2007). Musical interventions can be implemented in individual and group versions. Drumming circles are a form of music therapy that is very useful for people with dementia because drumming stimulates the most basic, subcortical levels of the brain. Namely, the rhythm that can restore the feeling of movement and life is important here (Sacks, 2007).

When it comes to examples related to the previous ones, we can cite the pianist Arthur Balsam who lost all memory of the main events of his life, did not recognize close friends he had known for decades, but performed the concert flawlessly, without the need for help from another pianist backstage (Sacks, 2007).

It seems that the emotional response to music is cortical and subcortical (Sacks, 2007). For this reason, even in the advanced stage of Alzheimer's disease, the patient can still perceive and enjoy it. Music is a healing way to help people with dementia to return to themselves and others, even for a short time, and the great contribution of music therapy can be reflected in its great importance and appreciation that it has within every culture (Sacks, 2007).

The effectiveness of music therapy in acute pain was shown by a meta-analysis (Bunt, 1997; Standley, 1986) and Dileo (2003) found a medium to a significant effect of music therapy on pain in adults, while a small to medium effect was found in children. Spintge (2000) found comprehensive evidence for the effectiveness of music in pain management and its psychophysiological effects. Musical intervention is also successfully applied in the therapy of chronic pain (Hillecke et al., 2005; Leins, 2006). It is usually applied in an interdisciplinary framework and aims to improve the sensation of pain and to cope with pain and comorbid disorders.

Musical stimuli that moderate psychophysiological responses to stress and pain are defined as Anxiolytic Music (AAM; Spintge, 1983). What is important to emphasize is that the medical-functional application of AAM includes: perioperative

stress within surgical and dental care, anesthesia and pain medicine, palliative care, neurological and psychological motor dysfunction, geriatrics, obstetric care, behavioral disorders, intensive care (Leins, 2006; Spintge, 2000). If we consider the psychophysical state of the patient in such situations, we can characterize it as a state of pain, distress, and anxiety. Research results in this area have led to what we call the “missing link concept” regarding rhythmicity as a bridge between AAM, on the one hand, and physiology and medicine, on the other (Spintge, 1996). The practical relevance of all these findings and concepts is expressed in the following ways:

1. attention is focused on aesthetic stimuli;
2. there is a distraction from the feeling of pain;
3. the response to stress is significantly reduced (including the reduction of released stress hormones in the blood);
4. pain tolerance is increased at the subcortical and cortical levels;
5. muscle tone decreases;
6. motivation, compliance, and psychomotor performance are improved, leading to;
7. improved motor coordination in rehabilitation programs for low back pain, Parkinson’s disease, stroke, etc. (Bernatzky et al., 2004; Thaut et al., 1997, 2003).

When it comes to recent studies on music interventions and music therapy, we can refer to the study by Scataglini et al. (2023) whose main goal was to examine the effect of Rhythmic Auditory Stimulation (RAS) using wearable devices in the recovery of a neurological population. Otherwise, RAS is the therapeutic application of musical stimulation or pulsed rhythmic stimulation to improve gait or aspects of movement related to gait (Thaut et al., 2015). By using RAS in a neurological population, especially in patients with Parkinson’s disease, the patient is more attentive during exercise (Aholt et al., 2019). In addition, the goal of Scataglini et al. (2023) was to integrate various musical interventions into clinical practice as additional interventions. A systematic review method was used by searching five databases: PubMed, PEDro, Medline, Web of Science, and ScienceDirect. In total, 2964 articles were found, and after two stages of screening only 15 studies were considered (for more information see Scataglini et al., 2023). The findings of the trial showed that wearable devices can be used both to quantify motor movements and to quantify the effects of RAS in the rehabilitation of neurological patients with Parkinson’s disease. Thus, RAS music therapy is an effective instrument for the rehabilitation of patients with movement disorders as well as for inclusion in the health system. It is possible that these results can be applied to other neurological disorders and the authors indicate the need to identify global strategies and standardized methods to use music therapy in different clinical contexts (Scataglini et al., 2023).

By summarizing the information based on the review of the articles obtained through research, a discussion and conclusion are reached, which give us a brief but significant overview of the benefits of musical interventions and further guidelines for the widest possible application.

Discussion

By searching the literature related to the topic of musical interventions, it can be concluded that music, from the ancient times of the ancient Greek and Indian civilizations, through the thinking of old Western philosophers until today, occupied and occupies an increasingly important place as a special therapeutic modality. Its importance has been observed in the areas of physical recovery, communication skills, socio-emotional recovery, and cognitive improvement. Music as a type of therapy has a great impact on both clinical and non-clinical populations. Research efforts have led to the development of a new profession of music therapists and a reorientation to a new clinical research, paradigm, and thus Neurological Music Therapy (NMT), Anxiolytic Music (AAM), Rhythmic Auditory Stimulation (RAS as a form of music therapy based on modern technologies) have been developed. Accordingly, there are numerous studies on the positive effects of music therapy in children, adolescents, and the elderly population, on the reduction of pain, stress, and on the neurological population (Freitas et al., 2022; Hurt-Thaut, 2016).

In addition, nowadays, considering the growing aggressiveness of children and adolescents, children should be asked in schools, with adequate questionnaires, about their preferred stimulating types of music. They should play it on vacations because in practice it is noticeable that it calms them down and there are fewer incidents, so it could be a recommendation for further effective use of music within the framework of "music prevention". Accordingly, in the elderly population, with timely preventive action, and based on the results of methodologically well-designed research, within the framework of "music-prevention", certain neurological disorders could perhaps be prevented and their consequences remedied to a greater extent. It is important to point out that in all mentioned age categories, listening to soothing music and sitting in silence reduce tension more than exposure to noise or stimulating music (Hasegawa et al., 2003; Iwanaga et al., 2005; Lingham & Theorell, 2009). Considering the impact of musical interventions in pain therapy, we can state that research has shown that they lead to a reduction in the feeling of pain, but, still, to a greater extent in the elderly than in the younger population (Dileo, 2003). Also, on the one hand, when it comes to the younger population, musical interventions encourage cognitive, sensorimotor, speech, and language development along with the development of psychosocial skills (Hurt-Thaut, 2016; Váradi, 2022, Rodriguez-Gomez & Talero-Gutiérrez, 2022); on the other hand, with the geriatric population, they achieve great success with the aim of solving problems arising in the previously mentioned areas (Hurt-Thaut, 2016).

There are also limitations of the aforementioned studies and research. The limitations of this paper are in the close connection with the facts that the largest number of studies are of the meta-analytical type, that the researches were mostly carried out on smaller samples, that more widespread terminological clarity is needed, that the results of some studies and research cannot generalize without additional research, as not all factors have been sufficiently controlled yet such as socio-cultural factors. However,

there are certain guidelines that should be worked on in the coming period in order for musical interventions to be more widely applied and better incorporated both in clinical institutions and the clinical population as well as in the non-clinical population.

Conclusion

Considering the literature and research in the field of musical interventions, this paper presents the definitions, history, and various advantages of the application of these interventions in children, adolescents, and the elderly, as a therapeutic modality that is increasingly relevant. Also, in this paper, we discussed the demarcation of musical interventions according to the type of role: diagnostic, preventive, and interventional means.

However, it can be concluded that further and more controlled research in this area on larger samples can contribute to further improvement of the application and effects of music treatment. Also, a more widespread application in the educational and business context would contribute to the reduction of the ever-present “social anxiety”. This could be a premise for one of the types of research in this area in the future. The centuries-long proven, beneficial effects of music on mental health, along with established research and clinical paradigms, provide an excellent scientific basis for further academic research. It would provide additional guidelines for more intensive incorporation of musical interventions in a preventive, diagnostic, and interventional context.

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Pogodnosti muzičkih intervencija

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Apstrakt

Muzika je kroz istoriju čovečanstva bila značajno sredstvo koje je doprinosilo kako izražavanju osećanja tako i lečenju. Danas je njena primena prilično široka kako u nekliničkoj tako i u kliničkoj populaciji. Predmet rada je prikaz istorijata, razvoja i definicija muzike kao intervencije, muzikoterapije i pogodnosti njene primene kod dece, adolescenata, u gerijatrijskoj populaciji, u redukciji stresa, u psihoterapiji, u okviru tretmana neuroloških poremećaja i terapiji bola. Analiziranje pogodnosti primene muzike kao intervencije izvršeno je metodom pretraživanja i analize dela dostupne literature. Takođe, muzičke intervencije su razgraničene na: dijagnostičke, preventivne i interventne. Može se zaključiti da se, uz postavljene istraživačke i kliničke paradigme i uzimanje u obzir ograničenja dosadašnjih studija, pruža naučna podloga za dalja akademska istraživanja. Ona bi dala dodatne smernice za intenzivniju i korisniju inkorporaciju muzičkih intervencija u prethodno spomenutim oblastima.

Ključne reči: muzičke intervencije, deca, adolescenti, gerijatrija, terapija

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Methodological Correctness of Research in Measuring Implicit Attitudes: a Systematic Review^{1*}

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Abstract

Implicit measures of attitudes provide an assessment of attitudes that respondents are unwilling to express or might not be aware of. This paper presents a systematic review of scientific literature in the field of measuring implicit attitudes, in which the current state and position of this construct are reviewed with the aim of assessing the meeting of scientific methodological criteria of knowledge acquisition. Empirical materials were obtained in February 2023 through the following search engines and platforms: Google, Google Scholar, SAGE, APA PsycNet, EBSCO, ScienceDirect, ResearchGate and JSTOR. Inclusion criteria: a paper published in a scientific journal, in English, available in its entirety in electronic form, in the field of psychology/social sciences, published from 2000 to the date of the search. In most reviewed sources, the Implicit Association Test (IAT) instrument was used, so this was added as an inclusion criterion. The final number of studies for analysis was 22 – five review papers and 17 research papers, mostly experimental studies. The papers were published in scientific journals with a high impact factor, written in the IMRAD format, the methods used were adequately presented, systematically controlled research procedures and appropriate statistical techniques were used, the conclusions were based on data, and the critical attitude of the researchers is present. The metric characteristics of the instruments are generally at an acceptable level – adequate internal consistency reliability, convergent and internal validity, predictive ability, but there are problems in the domain of construct and ecological validity.

Keywords: implicit attitudes, measures, systematic review, IAT

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Methodological Correctness of Research in Measuring Implicit Attitudes: a Systematic Review

Implicit attitudes are introspectively unidentified (or incorrectly identified) traces of past experience that mediate a favourable or unfavourable feeling, thought, or action toward social objects (Greenwald & Banaji, 1995). According to the APA psychological dictionary, a measure of implicit attitudes is any attitude evaluation procedure in which a person is not aware of the fact that their attitude toward something or someone is being evaluated (APA, 2023).

In the social sciences, the dominant method of measuring attitudes is the collection of explicit self-reports in the form of self-rating scales. However, since the early days of attitudinal research, researchers have often been concerned that respondents may sometimes be unwilling or unable to report their attitudes in an unbiased manner (DeMaio, 1984, as cited in Wittenbrink & Schwarz, 2007). Research has shown that respondents' answers are highly context-dependent and vary as a function of who asks, how they ask, and related variables (Schwarz et al., 1998; Sudman et al., 1996; Tourangeau et al., 2000, as cited in Wittenbrink & Schwarz, 2007). Some of these context effects reflect the presence of strategic responding, while others reflect cognitive and communicative processes involved in question comprehension and judgment formation. Psychologists have set out on a quest to find a measure of attitudes that does not rely on participants' introspection and honesty (Vargas et al., 2007). The concerns of the scholars on this topic have encountered different methodological and theoretical responses, which can be classified into three categories. One category of responses includes retaining explicit self-reports as the key measure for assessing attitudes. In doing so, the presumed reluctance of respondents to accurately report their attitudes is resolved by minimizing incentives for socially desirable responding by applying procedures ranging from simple assurances of anonymity to complex randomization techniques (Bradburn et al., 2004, as cited in Wittenbrink & Schwarz, 2007). The second category of methodological approaches attempts to assess the evaluative responses of research participants in ways that circumvent any opportunity for strategic responding, thus relying on assessment of physiological responses and brain activity (Ito & Cacioppo, 2007; Olsson & Phelps, 2007), but this will not be the topic of this paper.

The third category of methodological responses that addresses a potential solution to concerns about response bias replaces explicit self-reports of attitudes with indirect measures. Since respondents are likely unaware of the relationship between indirect measures and their attitudes, the assumption is that these measures minimize incentives and opportunities for strategic responding. Theoretically, the use of indirect measure is based on the assumption that attitudes exert a systematic influence on people's performance regarding various tasks and that the size of this effect can serve as an index of underlying attitude. Implicit measures of attitudes provide an assessment of attitudes that respondents are unwilling to express directly or may not even be aware of (Wittenbrink & Schwarz, 2007). Throughout the history

of attitude research, these measures have taken different forms in accordance with historical changes in the basic conceptualization of attitudes – from the early use of projective tests (Proshansky, 1943, as cited in Wittenbrink & Schwarz, 2007), to currently contemporary measures of response latency – sequential priming procedure and response competition procedure (Lane et al., 2007; Wittenbrink, 2007), and a low-tech “pen-paper” alternative (Vargas et al., 2007). In this paper, we will deal with approaches from this category.

One of the accepted conceptualizations of attitudes, within the implicit measurement approach, defines attitudes as stored object–evaluative associations that are automatically activated upon exposure to the attitude object (Fazio, 1995, as cited in Wittenbrink & Schwarz, 2007) and relies on priming procedures to assess the strength of the object-evaluation link. As Ferguson and Bargh (Ferguson & Bargh, 2007, as cited in Wittenbrink & Schwarz, 2007) emphasize, attitudes conceptualized and measured in this way are often assumed to be context independent.

Today, there are a number of measures for non-obtrusive or “implicit” measurement of an individual’s valuation according to political, social, economic and personal topics, although the question of their reliability and validity is open. The most widely used implicit measures of attitudes today rely on response time measurement (Wittenbrink & Schwarz, 2007). These aforementioned measures take advantage of one of two reliable observations, namely, (1) sequential priming procedure - the observation that exposure to the initial concept (the prime) activates semantically related concepts in memory, thus reducing the time needed for their identification (e.g., the prime stimulus *doctor* facilitates subsequent responses to the related stimuli *nurse*) or (2) the response competition procedure - the observation that a stimulus is responded to more slowly when it contains multiple features that each imply a different response (interference effects). The best-known response competition procedure is the Implicit Association Test (IAT) (Greenwald et al., 1998, as cited in Wittenbrink & Schwarz, 2007). The IAT presents discrimination tasks that are combined in specific ways across a sequence of five steps (more in the Method section below). It examines how quickly an attitude object can be categorized positively or negatively and ascribes importance to differences in milliseconds of the response time (Greenwald et al., 1998, as cited in Mitchell & Tetlock, 2015). These measures define attitudes as evaluative associations with an attitude object and do not require conscious approval of the evaluation or behavioral manifestation of the attitude which should be attributed to an individual.

This paper presents a systematic review of empirical literature in the field of measuring implicit attitudes from the year 2000 until the date of the literature search for this paper. To the best of the author’s knowledge in the field of interest, there are some review papers with, to some extent, discordant results (e.g., Sherman & Klein, 2021; Brownstein et al., 2019; Dimofte, 2010; Nosek et al., 2011; Nosek, 2007) and there is a lack of a systematic review of empirical data, which is the rationale for conducting this research. Furthermore, the paper is concerned with inspecting the current state and position of the construct of implicit attitudes in science, with the aim of assessing the methodological correctness, i.e., the fulfilment of scientific

methodological criteria for the acquisition of knowledge and answers to the question of whether the empirical material from this field according to its characteristics belongs to the domain of “good practice” of scientific production. Being aware that question of demarcation between science and pseudoscience is still a subject of great debate among philosophers of science and scientists in general (Ferguson, 2015; Lakatos, 1978; Popper, 1963; Skinner, 1990; as cited in Hedrih & Hedrih, 2022), it can be also noted that there are some tendencies and regularities that can be used in practice as demarcation criteria for differentiating between real science and pseudoscience posing as science. Demarcation criteria (further described in the method section) proposed by Hedrih and Hedrih (2022) is used for evaluating the research methodology for measuring implicit attitudes applied in the units of analysis (published papers).

Method

Research procedure and acceptable sources

Empirical material for this work was obtained by searching sources in English, available in electronic form through Google, Google Scholar and electronic services for searching electronic scientific journals which are available through the service on the platform of the Serbian Library Consortium for Coordinated Acquisition (KoBSON). The search was carried out by the author of this paper in February 2023 (12th and 13th) by specifying keywords (implicit attitude measure) in the specified search engines. First, a preliminary review of the available literature was made through the Google in order to assess the representation of the studied topic in non-scientific sources and scientific journals, and then a search was continued through the Google Scholar search engine exclusively for scientific journals of all categories from the year 2000 to the date of the search because quite a few of such sources appeared in the initial search.

Criteria for Source Inclusion

- Published paper (review or research) in a scientific journal.
- The paper is in English.
- The paper is available in its entirety in electronic form through the used browsers/services.
- The paper was published since 2000 until the date of the search.
- The paper is from the field of psychology/social sciences.

Literature search, collecting and selecting units of analysis

The literature search commenced with the Google search engine on February 12, 2023 according to the following key words: implicit attitude measure, and the criterion was set that the sources should not be older than the year 2000. The first three pages in this search engine were reviewed and out of 28 items 14 were academic articles (one of which was repeated three times, one was published before 2000, one was not from the field of psychological/social sciences but from the IT field, two papers were not available in their entirety, three units were chapters in a book - a monograph by a well-known publisher (out of which one unit was repeated twice), three units were monograph books by a well-known publisher (one was repeated), one master's thesis, one unpublished meta-analysis, two units were from dictionaries, i.e., psychological encyclopedias, three units were popular/psychoeducational websites and one unit was a blog. Since more than a half of the reviewed units were related to academic articles and books, and the Google search engine offered an immediate option for the search of academic articles, the search was continued through the Google Scholar search engine with the same given words, time frame and criteria in order to display the most significant results. The first three pages were reviewed in this search engine as well (12th 13th January, 2023) and out of 30 units, 25 were academic articles (one of which was repeated from the previous search), two units were chapters in a book – a monograph by a well-known publisher (one was repeated twice), another two units were monograph books by a well-known publisher (one was repeated) and one unit was a preprint of a scientific article.

As a result of the first search through the Google search engine, 8 papers were retained in their entirety from scientific journals, and as a result of the second search through the Google Scholar search engine, additional 24 papers were retained, which makes a total of 32 papers in their entirety (review and research) from the field of psychology/social sciences on the topic of measuring implicit attitudes. As only abstracts were mostly available via the Google and Google Scholar search engines, the papers were accessed in their entirety by using services on the KoBSON platform (SAGE, APA PsycNet, EBSCO, ScienceDirect), as well as the ResearchGate and JSTOR platforms.

Through a preliminary review of 32 papers in their entirety, it was observed that several implicit attitude measures appear in overview/theoretical papers (7 of them) and research papers (25 of them): Implicit Association Test (IAT) (Greenwald et al., 1998), Affective Priming Task (APT) (Fazio et al., 1986), Affective priming (Degner & Wentura, 2010), Semantic Priming Task (SPT) (Wittenbrink et al., 1997), Affect Misattribution Procedure (AMP) (Payne et al., 2005), Manikin task (De Houwer et al., 2001), ID-EAST (Huijding & De Jong, 2005), GNAT (Nosek & Banaji, 2001), The Brief Implicit Association Test (BIAT) (Sriram & Greenwald, 2009), The Single Category Implicit Association Test (SC-IAT) (Karpinski & Steinman, 2006), and Child IAT (Baron & Banaji, 2006).

By reviewing the articles further, it was concluded that 25 of them (out of a total of 32) use the Implicit Association Test (IAT) (Greenwald et al., 1998) as the only implicit measure of attitudes or in some cases with other instruments. Due to the dominant representation of this instrument, and for the sake of a more homogenous

sample of analysis units, it was decided to *narrow the topic of this paper* to only this measure of implicit attitudes (the Implicit Associations Test - IAT) and to analyze further only the research papers (18 of them) in which this test is used, or review/theoretical works (7 of them) in which it was critically examined. Therefore, this selection does not include two papers that use a significantly modified version of this instrument - the Single-category version (SC-IAT) (Muschalik et al., 2019) and the Brief version (BIAT) (Sriram & Greenwald, 2009), as well as the papers of other authors that use other instruments (Dalege & van der Maas, 2020; Echabe, 2013; Genschow et al., 2017; Olson & Fazio, 2001; Spence & Townsend, 2007).

Moreover, a more detailed review of the papers in their entirety found that the two theoretical papers, in which the IAT instrument was reviewed, were focused primarily on the field of economics (Bertrand et al., 2005) and law (Greenwald & Krieger, 2006), and not on the field of psychology like the remaining papers, so these two papers were also excluded from further analysis, thus leaving 5 review papers in the selection.

As far as the samples of respondents in the remaining research papers (18 of them) are concerned, in 17 papers the sample consists of adult respondents, and in 15 cases it is composed of students, one sample includes teachers and another one health workers. In only one paper (Baron & Banaji, 2006), the main goal was to compare the performance of children and adults on the IAT and the development of implicit attitudes, which made us exclude this paper from further analysis. Thus, the total number of papers for analysis is 22.

Measure used in units of analysis

Implicit Associations Test (IAT) (Greenwald et al., 1998) assesses the association between a *target-concept discrimination* and an *attribute dimension*. It presents discrimination tasks that are combined in specific ways across a sequence of five steps: 1) initial target-concept discrimination, 2) evaluative attribute discrimination, 3) first combined task, 4) reversed target-concept discrimination, and 5) reversed combined task. The procedure starts with the introduction of the target-concept discrimination. This and subsequent discriminations are performed by assigning one category to a response by the left hand and the other to a response by the right hand on the computer keyboard. The second step is the introduction of the attribute dimension, also in the form of a two-category discrimination. These (target-concept and attribute) are combined in the third step and then recombined in the fifth step, after reversing response assignments (in the fourth step) for the target-concept discrimination. As a matter of interest is the speed with which participants can perform the two superimposed discrimination tasks at step 3 and step 5, and an *IAT effect* is defined as the difference in mean latency between these two conditions (steps).

For example, to assess attitudes toward African Americans and European Americans, the first discrimination task presents names that are typical for the respective group and asks participants to categorize each name as “White” versus “Black.” They do so by pressing a response key assigned to “White” with the left hand or

a response key assigned to “Black” with the right hand. Next, the second discrimination task presents words with pleasant (e.g., love) or unpleasant (e.g., poison) connotations, which participants classify by pressing the left or right response key. At the third step, these two tasks are superimposed and participants press the left key when either a White name or a pleasant word is shown, but the right key when either a Black name or an unpleasant word is shown. This task is easier (done faster) when evaluatively associated categories share the same response key—for example, when White participants press the left key to categorize White names and pleasant words. At the fourth step, the assignment of keys to White and Black names is reversed, so that participants who first used the left key for White names now use the left key for Black names. Finally, the two discrimination tasks are again superimposed, resulting in an assignment of “Black” and “pleasant” to the left response key and “White” and “unpleasant” to the right response key. In the present example, a faster response at step 3 compared with the response at step 5 is thought to indicate that White names and positive evaluations, and Black names and negative evaluations, are more strongly associated than the reverse pairings.

Procedure for assessing and evaluating units of analysis

For evaluating the methodological correctness (adequacy) of research methodology for measuring implicit attitudes applied in the units of analysis (published papers) criteria for demarcation between science and pseudoscience proposed by Hedrih and Hedrih (2022) were used:

1. publishing results: Scientific work is primarily first published for experts, undergoes review and intense examination and scrutiny by other experts; it is published for the general public only after it successfully passes evaluation by experts. Conversely, pseudoscience targets the general public and review or evaluation by experts is actively avoided. This criterion was assessed through inspecting sources where the papers included for analysis are published (list, impact factor).
2. replicable results: Science requires replicable results, procedures are described in sufficient detail for other scientists to be able to replicate them and thus verify results themselves, whereas in pseudoscience, results cannot be verified due to vaguely described procedures. This criterion was assessed through inspecting papers included for analysis in their entirety, with special focus on indicators in the method section.
3. treatment of errors: In science, errors are actively sought in order to correct them, whereas in pseudoscience errors are ignored, hidden, and initial concepts are never abandoned. This criterion was assessed through inspecting papers included for analysis in their entirety, with the focus on the author’s awareness of possible errors and places for improvement, as well as the critical stance, especially in discussion and limitations sections.
4. progress of knowledge: Science progresses; with new studies the quantity of knowledge about the phenomenon and its underlying physical

processes increases, whereas in pseudoscience there is no progress with time. This criterion was assessed through inspecting papers included for analysis in their entirety, with the focus on indicators of improved knowledge of researched phenomena, especially in the results, discussion, and conclusion sections.

5. use of evidence: Science convinces through presenting evidence and logical arguments, whereas pseudoscience tries to get people to believe in it even in spite of existing evidence, not because of it. This criterion was assessed through inspecting papers included for analysis in their entirety, with the focus on type of evidence and supporting arguments used especially in the results and discussion sections.
6. how it is supported: Scientific products undergo rigorous examinations and testing before being placed on the market, whereas the sale of problematic products, either ineffective or detrimental, is the main source of income for pseudoscience. Due to the nature of units of analysis, it is not expected to have the data needed to evaluate according to this criterion, but if such material occurs through detailed inspection of papers included for analysis, it will be assessed.

In accordance with good practice and valid conduct in performing the psychological testing, ethical principles codified in codes of ethics were used (codes of ethics are created by national associations of psychologists in each country). As an evaluation criterion for assessing papers included in the analysis, we used two widely known codes of ethics – United States of America APA Ethical Principles of Psychologists and Code of Conduct (2016), and Code of Ethics and Conduct (2018) of the British Psychological Society.

In order to obtain a concise overview of the papers included in the analysis with basic study characteristics (source, study design, sample), abstracts and method sections of all papers were read and analyzed, as well as whether their form followed the IMRAD form of scientific articles (see Table 1). The obtained data was used mainly for evaluating according to the first criterion. For a more in-depth analysis of whether the research methodology of the included papers meets the set criteria, starting from the beginning of the list given in Table 1, seven original empirical papers (almost a third of the analysis units) were read, analyzed and evaluated in detail. Some of the papers from the list were excluded from the more detailed analysis due to the limitation of the length of this paper. Review papers were not included in this part of the evaluation.

Results

The process of selecting units of data, inclusion and evaluation criteria is already described in detail in the Method section above. The following Table 1 will show a concise overview of the papers included in the further analysis, their basic characteristics and the characteristics of the sources in which they were published.

Table 1
Overview of studies included in the systematic review

No.	Author (year)	Information about the study					Sample	IAT reliability
		Source (Journal, list, IF ³)	IMRAD form	Study design	Country	Respondent source		
1.	Sherman & Klein (2021)	Frontiers in Psychology (SSCI, 4.23)	yes	Review				
2.	Cunningham et al. (2001)	Psychological Science (SSCI, 2.76)	yes	Experiment	USA	Students for ECTS ⁴	93	$\alpha = .78$
3.	Brownstein et al. (2019)	WIREs Cognitive Science	yes	Review				
4.	Friese et al. (2008)	British Journal of Social Psychology (SSCI, 1.70)	yes	Experiment 3 studies	Switzerland	Students (Female) ⁴ (for ECTS) ⁴	88; 66;	$\alpha = .93$
5.	Dimotte (2010)	Psychology and Marketing (SSCI, 1.38)	yes	Review		Students (Male) for 10€ ⁴	45	
6.	Nosek et al. (2011)	Trends in Cognitive Sciences (SSCI, 12.58)	yes	Review				
7.	Nosek (2007)	Current Directions in Psychological Science (SSCI, 2.75)	yes	Review				
8.	Petty et al. (2006)	Journal of Personality and Social Psychology (SSCI, 4.22)	yes	Experiment 4 studies	(USA) Spain (USA) (USA)	Students for ECTS ⁴	(98); 70; (77); (45)	
9.	Rydell & McConnell (2006)	Journal of Personality and Social Psychology (SSCI, 4.22)	yes	5 experiments	USA	Students for ECTS ⁴	170; 186; 113; 29;	

10.	Perugini (2005)	British Journal of Social Psychology (SSCI, 1.81)	yes	(quasi-) experiment 2 studies	UK	Students for 2€ ⁴	48; 109
11.	Kim (2003)	Social Psychology Quarterly (SSCI, 0.60)	yes	experiment 2 studies	USA	Students for ECTS ⁴	50; 64;
12.	Van den Bergh et al. (2010)	American Educational Research Journal (SSCI, 2.47)	yes	Combined methods	Netherlands (students)	Teachers for 10€ ⁴	73; 41; (434)
13.	Karpinski & Hilton (2001)	Journal of Personality and Social Psychology (SSCI, 3.61)	yes	experiment 3 studies	USA	Students for ECTS ⁴	43; 28;
14.	Rudman & Kilianski (2000)	Personality and Social Psychology Bulletin (SSCI, 1.20)	yes	experiment	USA	Students for ECTS ⁴	85; 69
15.	Banse et al. (2001)	Zeitschrift für Experimentelle Psychologie (0.31)	yes	experiment 2 studies	Germany	Students for ECTS ⁴	101; $\alpha = .88$
16.	Karpinski & Steinman (2006)	Journal of Personality and Social Psychology (SSCI, 4.22)	yes	Experiment 4 studies	USA	ECTS ⁴ ; voucher, - ⁴	79; $\alpha = .81$
17.	Brunel et al. (2004)	Journal of Consumer Psychology (SSCI, 0.85)	yes	experiment 2 studies	USA	Students for ECTS ⁴	56; $r = .82$
18.	Nosek et al. (2002)	Group Dynamics: Theory, Research, and Practice (SSCI, 0.70)	yes	experiment	USA	Online platform over 2 years	66; $r = .58$ 81; $r = .75$ 84; $r = .78$
19.	Teachman & Brownell (2001)	International Journal of Obesity (SCIE ² , 2.19)	yes	experiment	USA	Health workers ⁴	84
20.	Maison et al. (2004)	Journal of Consumer Psychology (SSCI, 0.85)	yes	quasi-experiment;	Poland	Students for \$1.33 ⁴ ;	40; 40;

					General for \$1.33 ⁴ ;	103
					Highschool students ⁴	
21.	Turner & Crisp (2010)	British Journal of Social Psychology (SSCI, 2.05)	yes	experiment 2 studies	UK	Students for ECTS ⁴ 25; <i>r</i> = .58
22.	Swanson et al. (2001)	Cognition and Emotion (SSCI, 1.76)	yes	quasi- experiment	USA	Students for ECTS ⁴ 84; 196 <i>r</i> = .82

Note. ¹Social Sciences Citation Index (SSCI) – includes 3,400 of the world's most influential journals in 58 social science disciplines. More than 9 million records and 1.22 million cited references date from 1900 to the present; ²Science Citation Index Expanded (SCIE) – includes more than 9,200 of the world's most influential journals in 178 scientific disciplines. More than 53 million records and 1.18 billion cited references dating from 1900 to the present (Downloaded from <https://www.institut.edu.rs/staje-to-sci-lista-wos-i-kako-da-odabeream-easqpi-z-svoje-nacne-oblasti/> on 16th February, 2023); ³Impact Factor; ⁴convenient sample.

In accordance with the main subject of this paper, which includes a critical review of the research methodology for measuring implicit attitudes, in order to gain a better insight into the factual situation in this area and obtain more data for evaluation according to the set criteria, several papers from the above-mentioned list of studies (Table 1) will be analyzed in more detail. In the following text, research studies that investigate implicit attitudes by using the Implicit Association Test (IAT) (Greenwald et al., 1998) will be reviewed by employing mostly the original research procedures of the authors of this test (see IAT description in the Method section), with minor modifications and the stimulus change.

The second included study from the list in Table 1 (Cunningham et al., 2001) was a within-subject (repeated measuring) experimental design. The respondents gave their informed consent and the ethical principles of conducting research were adhered to. This paper presents an assessment of the internal consistency reliability, stability over time, and convergent validity of three implicit attitude measures. Attitudes toward members of the black and white races were measured on four separate occasions at a 2-week interval by using three relatively implicit measures (Response-Window Implicit Priming, Implicit Association Test – IAT – the subject of interest in this paper, and Response-Window Implicit Association Test) and one explicit measure (Modern Racism Scale). The order of implicit measures was randomized for each participant in each session. The order of implicit and explicit measures was counterbalanced. The research procedure is described in detail. Cronbach's alpha coefficient of internal consistency was calculated for each measure in all four measurements and for the IAT the mean value was .78, which is at a satisfactory level, but still a little lower compared to explicit measures of attitudes (Cunningham et al., 2001). Current conventions suggest that an internal consistency of .80 (20% error) or higher represents good reliability (Cronbach, 1951), although many widely used scales remain in the .70 range (Robinson et al., 1991, according to Cunningham et al., 2001). The stability indices were initially low, and after correction by the latent variable analysis (removing measurement error), the authors found that (a) the stability indices improved (for the IAT .68) and (b) the implicit measures were in a statistically significant correlation with each other and they formed one latent factor (thus demonstrating convergent validity). The explicit measure of attitudes has statistically significant correlations with all implicit measures (with IAT $r = .30$) and their latent factor. This does not mean that implicit and explicit measures of attitudes are identical, but it does suggest that there is not a complete dissociation between them either. The authors state that the psychometric properties of these implicit attitude measures are better in the replication study than in previous studies and there is an awareness of the limitations of the study.

In the fourth paper from the list in Table 1, the authors (Friese et al., 2008) present three experimental studies with a control group that aim to test the theoretical assumption of social psychology that explicitly measured attitudes are particularly valuable for predicting intentional, controlled behavior, and the opposite that implicitly measured attitudes are more important for predicting less controlled, more impulsive behavior. In Study 1, on average 10 days before the experimental

session, the explicit attitude measure about fruit and chocolate was assessed, and in the experimental session participants first completed the implicit measure IAT (with the target categories ‘fruit’ and ‘chocolate’ and the attribute categories ‘pleasant’ or ‘I like’ and ‘unpleasant’ or ‘I don’t like’) followed by a short questionnaire, after which they completed the fruit-chocolate choice task which also contained low and high cognitive capacity working memory task (memorizing eight-digit or one-digit number). In Study 1, the working memory of respondents in the experimental group was temporarily encumbered with additional information intended to disrupt central executive functioning (memorizing eight-digit number), and this variable - cognitive capacity moderated the predictive validity of both explicitly and implicitly measured attitudes (IAT) in the fruit-chocolate choice task. Self-regulatory resources led to similar patterns regarding potato chips-eating behavior (Study 2) and beer-drinking behavior (Study 3). In addition to the predictive validity of measures of implicit and explicit attitudes, Study 3 explored more closely the relative contributions of explicitly measured attitudes and general standards of restraint as two distinct but complementary constructs that depend on control resources. However, Studies 2 and 3 used a significantly modified version of implicit attitude measure IAT - the Single-category version (SC-IAT), which is not a subject of interest in this paper. The results (obtained by using adequate statistical procedures) demonstrate that there is evidence that implicit measures of attitudes predict impulsive, but not controlled behavior, and with explicit measures the situation is vice versa, which can be applied in the analysis of the strength of impulses in consumer behavior and similar studies. In all three studies, respondents were randomly assigned to the experimental or control group. The respondents gave their informed consent and the ethical principles of conducting research were followed (debriefing was also done). The research procedure is described in detail and the discussion of the results takes into account the results of previous research, limitations and theoretical and practical contributions.

The eighth paper on the list in Table 1 (Petty et al., 2006) empirically re-examines the traditional attitude change model which assumes that when people appear to have altered their attitudes in response to new information, their old attitudes disappear and no longer have any effect. This research suggests that when attitudes change, the old attitude can remain in memory and influence behavior subsequently. The research consisted of four experimental studies in which initial attitudes were created and then changed (or not) by new information. In each study, the authors show that when people undergo attitude changes, their old and new attitudes can interact to produce evaluative responses consistent with a *state of implicit ambivalence*. The implicit measure of the IAT was used only in Study 2 (the experiment with a control group and an experimental group in which attitudes were changed, a complex design because the effect of a positive/negative “target” was also monitored). The results of Study 2 present that attitude change caused people to report less certainty on the implicit measure of attitudes (IAT) but not on the explicit one. The respondents gave their informed consent and the ethical principles of conducting research were followed. The research procedure, the statistical procedures used, results and implications are described in detail.

The ninth paper from the list in Table 1 (Rydell & McConnell, 2006) examines changes in implicit and explicit attitudes through five experiments. In the first experiment (complex between-subjects factorial design), the subjects were randomly assigned to 2 (valence of learned attitude: positive vs. negative) x 2 (level of reinforcement: 100%, 75%) x 2 (contrast information condition: control, vs. information that contradicts the attitude) groups. The attitude learning procedure and the way of applying the explicit and implicit (IAT) measure of attitudes are elucidated in detail. The results (obtained using adequate statistical procedures) imply that implicitly formed attitudes are not affected by the introduction of information that contradicts the attitude (explicit attitudes are affected), and that the slow-learning system is responsible for implicit attitudes, and the fast-learning system for explicit attitudes. The rest of the experiments are similar in design to the first one with minor changes. In the second experiment, certain subjects were given significantly higher levels of information which is opposed to the formed attitude in order to test whether they change then. At this point, respondents were randomly assigned to 2 (valence) x 2 (level of support) x 3 (counter-attitude information condition: control, 20 counter-attitude information, 100 counter-attitude information) groups. With a greater number of pieces of contrasting information, implicit attitudes also change, which suggests different mechanisms underlying implicit and explicit attitudes. In the third 2x2x3 factorial experiment, the first impression variable (true/false) was introduced instead of the attitude valence variable; in the fourth experiment, a complex experimental design of 1 (valence positive) x 1 (conditioning 100) x 2 (counter-attitude 0, toward 20) was used. As for the previous ones, the alterations in the design of the fifth experiment are described in detail. The results are adequately presented and discussed, pointing out possible problems and the ways for further research. There is no explicit information about informing and possible debriefing of respondents, although considering the requirements of the journal in which the paper was published, we assume that the paper adhered to ethical standards.

The tenth paper on the list in Table 1 (Perugini, 2005) tests predictive models of implicit (measured via computerized IAT) and explicit attitudes (questionnaire) – how well they predict behavior, through two studies. The first quasi-experimental study is about smoking behavior and provides confirmation for the multiplicative prediction model (implicit and explicit attitudes interact in the prediction of behavior). The second experimental study deals with preferences for snacks over fruit and supports the double dissociation model (implicit attitudes predict spontaneous behavior and explicit attitudes predict intentional behavior). In this study, the order of the instruments was counterbalanced, as was the order of the third and fifth steps in the IAT. In both studies, subjects were individually asked for their consent to participate in the experiment and it is stated that debriefing was done. The predictive validity of implicit attitudes was confirmed through two studies. The results are discussed in light of the importance of focusing on different patterns of prediction when investigating the directive influence of implicit and explicit attitudes on behavior. The authors also mention the limitations of the study and propose testing the models on other types of behavior and with other instruments.

Research on implicit attitudes contains the assumption that respondents cannot control their responses on implicit measures, but this was not explicitly verified in studies prior to Kim's (2003) study. The eleventh paper on the list in Table 1 examines the possibility of volitional control of the IAT, investigating in two experiments the ability of subjects to intentionally misrepresent their attitudes by using three different IAT measures. In the first experiment (group design with a control group and pre- and post-treatment observation), subjects were randomly assigned to a group that should give false answers about attitudes (experimental) and to a group (control) that gives spontaneous answers. There were no statistically significant differences between the groups, which indicates that subjects in the experimental group could not intentionally suppress their true attitudes. The second study is similar to the first one except that the topic is racial bias and that it is a quasi-experiment (division into groups according to their identification, white or Asian), and then by randomizing the division into three groups with regard to experimental conditions (control, false attitudes with the strategy of lying, false attitudes without a strategy). The group with the instructed strategy for false attitudes differs from the others.

In the twelfth study from the list in Table 1 (Van den Bergh et al., 2010), in the context of educating students belonging to ethnic minorities, it was examined whether the prejudices of teachers are reflected in their expectations toward students, as well as the academic achievement of their students. Prejudicial attitudes of elementary school teachers were assessed by using a self-report questionnaire and the Implicit Association Test (measured at school by means of a laptop computer in five blocks). Teachers' expectations were assessed through self-assessment questionnaires, and student achievement through the scores of the most recent standardized tests in text comprehension and mathematics. The results were processed by employing Multilevel Models constructed using MLwiN 2.02 (Rasbash et al., 2004, according to Van den Bergh et al., 2010) with variables at the student and teacher levels. The measures of attitudes/prejudices obtained by the self-assessment questionnaire do not achieve any effects, while it was determined that the attitudes - prejudices of teachers measured by means of the IAT elucidate different sizes of the gap in the achievement of different ethnic groups through the teachers' expectations. The results of this study imply that the use of measures of implicit attitudes may be important in educational research. All the research elements are explained in detail and critically reviewed with the awareness of limitations. For instance, not all variables of possible influence were controlled, the sample was composed through a public call on the website of the schools of the south-eastern part of the Netherlands and the respondents applied on a voluntary basis (bias sample selection), after which they were contacted and the research procedure was carried out.

Discussion and conclusion

The sources of implicit attitude measurement that are considered in this systematic review are mainly empirical papers in scientific journals, then review

papers in scientific journals, as scientific monographs, or their chapters. The reviewed papers were predominantly published in scientific journals with a high impact factor, primarily from the SSCI list, in which papers go through the process of (anonymous) peer review by other experts in the field, which is in line with the first proposed evaluating criterion.

A review of the available literature provides insight into the fact that research in this subfield is written in the form of scientific articles (abstract, introduction, method, results, discussion, and references). The method of presenting the instruments used, the sample, the method of sampling, as well as the method of data analysis, are clearly stated and it enables repetition of the research (second proposed evaluating criterion). Appropriate currently available statistical techniques were employed in the analysis of the results. In each research, the authors clearly indicated the shortcomings of the research itself. Thus, the illustrated papers are an example of the fact that the assumptions on which measures of implicit attitudes are based are verifiable (can be empirically confirmed or refuted), that the researchers' attitude is critical, that the empirical data were obtained through systematic and controlled procedures, and that the conclusions are based on the data (the second, third and fifth proposed evaluating criterion). Also, the authors of the above-analyzed studies adhered to ethical principles of conducting research (e.g., informed consent, debriefing) which is also an indicator of good scientific practice.

The measures they use do not always have the recommended levels of metric characteristics, but in a large number of cases they are at an acceptable level, there is evidence of adequate reliability, internal consistency, convergent validity, internal validity and predictive ability. The fact that the authors of implicit attitude studies compare these measures with explicit attitude measures, that they check the reliability and validity of their measures, that they verify the measure (IAT) in different contexts and with different stimuli, that they strive to improve them, supports the fact that they are aware of the importance of checking psychometric properties of implicit measures and that they do not operate in some isolated "alternate reality" (the third, fourth and fifth proposed evaluating criterion).

The definitions of terms are clear, although the studied construct belongs to the category of hypothetical constructs rather than intervening variables. Although an operational definition is being sought (intensity of association between a target-concept discrimination and an attribute dimension is assessed through response time measurement), it is still not completely possible for a wide range of constructs, and therefore there are problems in the domain of construct validity. However, the general approach is not common sense, the observation is not unrestricted, the reporting is not subjective and uncritical, although there are doubts about the exact definition of the term, the definitions are not vague, and the aim is to specify the domain of the studied construct (the fourth and fifth proposed evaluating criterion).

Part of the limitation of the reviewed research lies in the selection of samples on which the empirical verification of the construct is performed - it is mainly the student population (often they are researchers' students in an introductory course in psychology at a given university, mostly from the USA/Western Europe).

Therefore, the samples in these research studies are for the most part convenient, which raises the question of the representativeness of the samples themselves, i.e., the ecological validity of the research. However, this is a frequent case and practice in the scientific production in the field of psychological/social sciences. Moreover, it would be desirable if the samples were larger, but this is challenging given mostly the experimental study design.

Bearing in mind the proposed demarcation criteria, all of the above supports the fact that the measurement of implicit attitudes belongs to the domain of good scientific production, and not to the domain of pseudoscientific and common-sense thinking. Namely, pseudo-scientific production is characterized by the presentation of procedures and results in an insufficiently clear manner in publications intended primarily for the general non-expert public, while shortcomings are ignored and hidden (Hedrih & Hedrih, 2022), which is not the case here. The enumerated limitations and shortcomings of researching implicit attitude measurement are similar to those in other research in the field of social sciences, as well as the positive sides and achieved methodological standards. The level of knowledge and research on the measurement of implicit attitudes requires more empirical verification in different contexts both in terms of reliability and in terms of different aspects of validity. A theoretical clarification of the scope of this term and a clearer differentiation from related constructs are needed.

Limitations

The limitations of this systematic literature review may stem from the very method of literature review and the applied inclusion and exclusion criteria. Namely, we commenced with a very broad search, and the outcome would probably have been different if the search had been focused from the beginning within one of the subfields of the researched phenomenon. The fact that the most important sources, which have been cited hundreds of times, have been selected may suggest the possibility that the better papers in the field that have withstood the judgment of scientific criticism have been considered, and that examples of not so good research practice have not even been found, if such exist. However, citations can stem not only from scientific recognition, but also from contestation, but the nature of citations was not the subject of this paper. The analysis includes papers from a relatively small number of journals and by a relatively small group of authors, mostly from the first ten years of the inclusion criteria, which may be an illustration of the actual situation, but also the bias of the search method. By defining the search to include papers in English, published in scientific journals in electronic form, this analysis does not include results published in books, dissertations, proceedings and conference abstracts, as well as unpublished papers. The potential advantage of this paper is that the area of measuring implicit attitudes has been narrowed down to one instrument that has proven to be the most popular, which makes the results more easily comparable and it is more undemanding to draw unequivocal conclusions. Moreover, this instrument

was established a couple of years (1998) before the defined date for study inclusion (year 2000), and it covered the entire scope of the search.

Considering the above-mentioned limitations, it is recommended, for future analyses of this type, to search for the units of analysis through several services for searching scientific production, and it would be useful to redefine the inclusion and exclusion criteria in order to make the study more comprehensive. Despite the aforementioned limitations and the fact that the results should be taken with reservations and that they do not apply to the entire range of implicit attitude measures, the established findings may be of use to researchers in this area.

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Metodološka korektnost istraživanja u merenju implicitnih stavova: sistematski pregled

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Apstrakt

Implicitne mere stavova daju procenu stavova koje ispitanici ne žele da izraze ili kojih možda nisu svesni. Ovaj rad predstavlja sistematski pregled naučne literature iz oblasti merenja implicitnih stavova, u kome se sagledava trenutno stanje i položaj ovog konstrukta sa ciljem ocene ispunjenosti naučno-metodoloških kriterijuma usvajanja znanja. Empirijski materijali su dobijeni u februaru 2023. preko sledećih pretraživača i platformi: Google, Google Scholar, SAGE, APA PsicNet, EBSCO, Science Direct, Research Gate i JSTOR. Kriterijumi za uključivanje: rad objavljen u naučnom časopisu, na engleskom jeziku, dostupan u celini u elektronskom obliku, iz oblasti psihologije/društvenih nauka, objavljen od 2000. godine do dana pretrage. U većini pregledanih izvora korišćen je/analiziran instrument Implicit Association Test (IAT), pa je ovaj podatak naknadno dodat kao kriterijum za uključivanje radova. Konačan broj studija za analizu bio je 22 - pet preglednih i 17 istraživačkih radova, uglavnom eksperimentalnih studija. Radovi su objavljeni u naučnim časopisima sa visokim impakt faktorom, pisani u IMRAD formatu, korišćene metode su adekvatno prezentovane, korišćeni su sistematski kontrolisani istraživački postupci i odgovarajuće statističke tehnike, zaključci su zasnovani na podacima i prisutan je kritički stav istraživača. Metrijske karakteristike korišćenog instrumenta su generalno na prihvatljivom nivou

– adekvatna unutrašnja konzistentnost, pouzdanost, konvergentna i interna validnost, prediktivna sposobnost, ali postoje problemi u domenu konstruktivne i ekološke validnosti.

Ključne reči: implicitni stavovi, mere, sistematski pregled, IAT

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Exploring The Horizon of Science: A Brief Introduction to AI Ethics^{1*}

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Abstract

In recent years, a modern field of artificial intelligence (AI) ethics has been emerging. Today, there is virtually no sphere of social functioning untouched by AI in one form or another. Furthermore, the functional autonomy possessed by these intelligent systems is rapidly increasing. All indications suggest that this trend will continue and likely intensify in the near future. In this process, it is natural for important questions to arise that warrant thorough philosophical and psychological analysis. Timely engagement with these issues could prevent potential disagreements and unwanted outcomes. Therefore, the aim of this paper is to provide a brief introduction to the emerging field of AI ethics, highlighting the problems and questions that the contemporary field of AI ethics addresses. It is based on the recognition of the inseparability of any ethical discussion from its psychological antecedents and consequences. The paper will first delve into the definition of artificial intelligence, as well as the definition of AI ethics and its subject of inquiry. It will then explore the most significant questions and issues in AI ethics (in terms of urgency), including autonomous systems, machine bias, the problem of opacity (i.e., the “black box” problem), machine consciousness, technological singularity, and other important topics addressed by AI ethics. Finally, the paper will discuss the researchers and professionals engaged in AI ethics, the interest of psychologists in AI ethics, and their potentially critical role in this emerging scientific field.

Keywords: artificial intelligence (AI) ethics, machine bias, the problem of opacity (the black box problem), machine consciousness, technological singularity

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Exploring The Horizon of Science: A Brief Introduction to AI Ethics

One, a robot may not injure a human being, or, through inaction, allow a human being to come to harm. [...] Two, [...] a robot must obey the orders given it by human beings except where such orders would conflict with the First Law. [...] And three, a robot must protect its own existence as long as such protection does not conflict with the First or Second Laws.

In 1942, Isaac Asimov introduced these “Three Laws of Robotics” in his renowned short story, “Runaround,” which has since become a seminal work in science fiction literature. About 80 years later, at the intersection of scientific advancement and speculative fiction, the field of AI ethics emerged, seeking to extend the discussion from its previous realm of science fiction into academic domains. Asimov’s laws have sparked discussions spanning several decades, engaging not only science fiction experts but also professionals in technical sciences and computer technologies. Undeniably, Asimov’s laws have played a pivotal role in the evolution of AI ethics, prompting Asimov himself to delve into the ethical implications, both positive and negative, that may arise from these laws in many of his subsequent works.

Over the past few decades, AI has permeated nearly every aspect of human society, influencing everything from everyday consumer choices to medical diagnoses and crucial state and international decision-making processes. The extent to which AI technology is reshaping our social interactions, primarily through the algorithms driving numerous social networks, is widely acknowledged and evident. AI is now a ubiquitous presence in virtually all spheres of social functioning. Tristan Harris, a renowned technology ethicist and former design ethicist at Google, famously stated that “AI already runs the world” (Orlowski, 2020). The level of functional autonomy exhibited by these intelligent systems is rapidly advancing. The undeniable fact is that AI significantly impacts our lives, decisions, and interpersonal relationships, and all signs indicate that this influence will continue and likely escalate in the near future. Modern historian Yuval Noah Harari (2018) places AI among the three paramount challenges that humanity must seriously confront in the coming decades, alongside nuclear war and ecological collapse. This process raises crucial questions that warrant thorough examination from both philosophical and psychological perspectives, as timely engagement with these issues has the potential to preempt numerous conflicts. Consequently, the objective of this paper is to provide a concise introduction to the emerging field of AI ethics, highlighting the problems and inquiries addressed within the contemporary realm of AI ethics (with ethical discussions inherently intertwined with the field of psychological science).

What is artificial intelligence (AI)?

Artificial Intelligence (AI) is, simply put, the programming of machines to perform tasks and processes that typically require human intelligence. Just like human intelligence, there are numerous definitions of AI, each emphasizing different aspects, largely based on the perspective and stance of the definer. One

widely accepted definition of AI in academic circles was proposed by Copeland (2020), describing AI as the ability of a computer or computer-controlled robot to perform tasks characteristic of intelligent beings, such as reasoning, symbolic thinking, generalizing conclusions, or learning from experience. The term “artificial intelligence” was coined in 1955 by a group of researchers who organized a two-month summer school at Dartmouth College (McCarthy et al., 1955). This event is often regarded as a pioneering endeavour in the study of AI.

Today, in the early years of the 21st century, when engineers, IT professionals, social science experts, and AI enthusiasts hear the term “AI,” they often envision a robust intelligent system closely resembling human intelligence, albeit with a machine origin. However, for several decades, there has been a debate about the feasibility and achievability of this notion. This debate has been significantly shaped by the emergence of large language models such as GPT-4 (<https://openai.com/gpt-4>). The discussion was initiated, in part, by the influential philosopher John Searle (1980), who contends that *strong or general AI* is fundamentally unattainable. Present achievements in the field of AI can be categorized as *weak AI* since current intelligent systems do not surpass the ability to solve seemingly complex tasks that can ultimately be decomposed into numerous simpler steps. Searle’s central argument posits that, regardless of a machine’s complexity and sophistication, it lacks *consciousness and/or a mind*, which he deems essential for genuine understanding – an attribute beyond the mere capability of performing highly intricate computational operations (Searle, 1980).

However, Searle (1980) momentarily overlooks the fact that consciousness and the mind remain unresolved inquiries in the realms of psychology, neuroscience, and philosophy. Many psychological and neurological phenomena can be adequately elucidated without invoking the concepts of consciousness or mind. Consequently, we lack a definitive argument against the proposition that human intelligence is not solely a complex system of biological algorithms, implying that it is only a matter of time before we begin to deconstruct human intellect into a greater number of simpler mental processes that can be mathematically represented or encoded as computer instructions (a belief shared by the organizers of the aforementioned Dartmouth College summer school).

Some authors (for example: MacClellan, 2023; Torrance, 2013), taking a broader perspective on the concept of intelligence rather than a *strictly biocentric* one, challenge the idea that intelligence is limited solely to living organisms. They propose that intelligence can also emerge in fully mechanical environments, provided that the system attains a sufficient level of complexity (Chalmers, 1996). For instance, xenobots, which are bioengineered robots created using stem cells from the African frog (*Xenopus laevis*), have already astounded researchers with their ability to move, self-heal, and even autonomously gather scattered debris (Kriegman et al., 2021). However, when the original synthetic particles were substituted with individual stem cells, these miniature living bots exhibited a remarkable behaviour – they self-assembled, bringing the cells together to construct entirely new xenobots. The very assertion that intelligence must necessarily have organic origins lacks scientific evidence or thorough investigation, thereby lacking a convincing scientific argument for why intelligence as a capability should be restricted solely to beings composed of organic-carbon chemistry. It fails to

account for the potential development of similar abilities in systems based on alternative materials, such as silicon, as exemplified by modern computer chips.

Therefore, it is evident that there is a broad spectrum of interpretations regarding the true nature of AI. The inquiry into what constitutes AI will likely remain unresolved until we gain a more precise understanding of long-standing concepts such as intelligence, consciousness, mind, and similar constructs that have accompanied us throughout millennia – a pursuit in which psychologists can undoubtedly play a pivotal role. Moreover, the progress in AI ethics and the advancements in comprehending intelligent systems offer psychologists a fresh perspective to explore the human mind – by conducting a comparative analysis of the human and artificial minds.

What is AI ethics and what does it deal with?

AI ethics, as a nascent scientific discipline, heavily draws on the slightly older field of machine ethics as its foundational framework. Anderson and Anderson (2011), distinguished pioneers in machine ethics, define its objective as the endeavour to create machines that adhere to ideal ethical principles or a set thereof during decision-making processes. In essence, machine ethics, as the name implies, aims to infuse an ethical dimension into the realm of machines. Moreover, machine ethics addresses concerns surrounding the moral status of intelligent machines, contemplating whether these machines should be attributed moral and legal rights. Machine ethics resides within the interdisciplinary and multidisciplinary domain of technology ethics, which is itself a subdivision of applied ethics. Presently, distinguishing AI ethics from machine ethics with precision remains challenging, and there seems to be no immediate necessity for such demarcation.

In the early 21st century, multiple approaches have emerged for integrating ethics into the realm of intelligent machines and systems. Within this context, we can identify at least three distinct types of approaches (Gordon & Nyholm, n.d.): (1) the bottom-up approach, (2) the top-down approach, and (3) the mixed or hybrid approach.

A *bottom-up approach* is exemplified by the systems discussed by Guarini (2006), which are rooted in casuistry. *Casuistry* is a process of reasoning aimed at resolving moral dilemmas by applying theoretical rules that were previously used to address other, often similar, moral dilemmas (“Casuistry”, 2021; Schmidt, 2014). These systems employ artificial neural networks to learn how to navigate specific ethical dilemmas that already have predetermined answers. Following a designated learning period (referred to as the “training phase” in AI systems), the system should possess the capability to autonomously address new ethical dilemmas. However, AI systems based on casuistry face challenges of reclassification and reflection (essentially, reconsidering a made decision). Guarini himself acknowledges that casuistry alone is an inadequate principle if the goal is to construct a comprehensive ethical AI system (which aligns with the aspirations of AI ethics).

The *top-down approach* combines two fundamental ethical theories, utilitarianism and deontology², with analogical reasoning (Dehghani et al., 2011).

² For introductory information on utilitarianism, please refer to Duignan & West (2021); for a basic

In these systems, the utilitarian mode prevails until “sacred values” are challenged, prompting a switch to a deontological mode that places less emphasis on utility and the consequences of actions (which are central to utilitarian ethics). To align such a system with the process of moral decision-making in humans, researchers rely on empirical findings from psychological studies on human decision-making in diverse ethical situations. One significant advantage of the top-down approach is its integration of the two prominent ethical theories, deontology and utilitarianism, in a coherent manner. However, the use of empirical psychological studies on human moral decision-making can pose challenges as it implies that the majority’s decision-making becomes the yardstick for ethical correctness in decision-making.

The *hybrid/mixed approach*, as its name implies, seeks to integrate the characteristics of the two aforementioned approaches. These systems are highly complex and are still in the early stages of development.

AI ethics is a burgeoning scientific discipline, which poses challenges in providing a concrete and precise definition of its scope. Furthermore, no matter how we attempt to delineate the interests of AI ethics, any enumeration will inevitably fall short as the field continually uncovers new topics to explore – an inherent characteristic of a growing scientific discipline. Gordon and Nyholm (n.d.) have presented a comprehensive overview of the primary areas that currently command the attention of AI ethics. They have also provisionally categorized the questions and concerns within AI ethics based on their urgency and their present relevance to individuals and societies. Table 1 presents their categorization. (AI ethics literature often carries a tone of urgency and a “call to action,” with authors underscoring the imperative of promptly addressing AI ethics issues.)

Table 1
The most important questions and issues in AI ethics by urgency

Short-term questions (early 21st century)	Mid-term questions (from the 2040s to the end of the 21st century)	Long-term questions (end of the 21st century and beginning of the 22nd century)
<ul style="list-style-type: none">• autonomous AI systems (in transportation and weaponry)• machine bias in legislation• privacy and surveillance• black box problem• decision-making in intelligent systems	<ul style="list-style-type: none">• AI in government administrations• moral and legal status of intelligent machines• human-machine interaction• mass automation	<ul style="list-style-type: none">• technological singularity• mass unemployment• space colonization

understanding of deontology, consult Encyclopaedia Britannica (2021).

Müller (2020) has also presented a similar categorization of the key questions and challenges in the field of AI ethics. He identifies the following critical debates: privacy and surveillance, behaviour manipulation, opacity and lack of transparency in AI systems, bias in intelligent decision-making systems, human-machine interaction, automation and its impact on the job market, autonomous systems, machine ethics, moral status of intelligent machines, and technological singularity. While this list is not exhaustive, it provides a comprehensive overview of the topics that are likely to gain significant importance in the years and decades ahead. The field of AI ethics is highly dynamic, and new questions and issues continue to emerge. As Gordon and Nyholm (n.d.) point out, this is arguably the fastest-growing area within the realm of ethics and moral philosophy, and undoubtedly a field in which psychologists can contribute significantly. Subsequent sections will delve into a more detailed examination of some of these themes.

Autonomous systems

When it comes to AI ethics, discussions about autonomous systems often focus on two phenomena: (a) autonomous weapons systems and (b) autonomous vehicles. This is understandable given the significant potential consequences that could arise from the direct interaction between these technologies and individuals.

Opinions regarding autonomous weapons systems are, expectedly, highly divided. Some authors argue that such systems could serve as a beneficial substitute for human armies (Müller & Simpson, 2014). For instance, if warfare were delegated to machines, it might potentially reduce the occurrence of war crimes, provided that the machines are equipped with ethical algorithms ensuring consistent adherence to internationally prescribed rules of warfare (Arkin, 2010). Conversely, there are those who believe that the widespread use of autonomous weapons systems could lead to a more casual engagement in warfare, raising numerous concerns about the practicality of developing algorithms capable of accommodating all rules of combat (Gordon & Nyholm, n.d.).

Autonomous vehicles are another important aspect to consider. With the growing popularity of the electric vehicle industry, which often incorporates autonomous driving capabilities (a trend spearheaded by Tesla, Inc. and its founder Elon Musk), it is only natural that autonomous vehicles are a focal point in AI ethics. The key concept revolves around the necessity of equipping autonomous vehicles with ethical algorithms that dictate their response in situations where human safety is jeopardized (Gordon & Nyholm, n.d.). This is crucial to accelerate the realization of the numerous benefits autonomous vehicles bring, including enhanced traffic safety, more efficient fuel utilization, and improved traffic management (Harari, 2018). Undoubtedly, this is one of the most pressing topics in AI ethics, given the gradual global deployment of autonomous transportation systems (TEDx Talks, 2018).

The urgency of this issue has already been recognized, as several individuals have lost their lives in accidents involving autonomous vehicles (National Highway Traffic

Safety Administration, 2022; Salter, 2023). One of the earliest incidents occurred in March 2018 when an experimental vehicle operated by Uber struck a pedestrian who was crossing the road, resulting in a fatal outcome (Wakabayashi, 2018). It was discovered that the vehicle encountered difficulty in classifying the object (in this case, the pedestrian) that suddenly appeared in its path. It initially identified the object as unknown, then as a vehicle, and finally as a bicycle. The vehicle began braking a few moments before the collision, but it was already too late to avoid the impact. Hence, the accuracy of AI systems within autonomous vehicles can be a matter of life or death. However, one may question why a pedestrian was on the road without any regulations and how, from an ethical perspective, an accident of this nature involving a vehicle with a human driver would be handled. As we will see, such double standards are a common occurrence in AI ethics, where people impose demands on machines that even the most morally upright individuals of the human species would struggle to meet.

Whether it is autonomous weapons systems or autonomous vehicles, the central question in AI ethics within these fields remains: What ethical principles should govern the decision-making processes in these systems when there is a possibility of endangering human life? While fatal outcomes related to autonomous vehicles are mostly seen as unfortunate and hopefully infrequent side effects of their use, deaths caused by autonomous weapons are generally regarded as something that can and should be avoided (there is even an active campaign on this topic called “Stop Killer Robots”; <https://www.stopkillerrobots.org/>). In both cases, it is widely believed that some level of control should remain in human hands (Santoni de Sio & van den Hoven, 2018). However, as some authors argue (for example: Königs, 2022; Santoni de Sio & Mecacci, 2021), this can lead to *responsibility gaps*, where it becomes unclear whether the autonomous machine³ or the human retaining some level of control over it is accountable for a particular outcome. By nature, *Homo sapiens* tends to attribute credit (i.e., responsibility) to themselves in cases of positive outcomes resulting from machine decisions, while assigning and shifting responsibility to the machine in cases of negative outcomes caused by its decisions. This phenomenon, known as *attribution bias*, has been a recognized concept in psychology since the mid-twentieth century (Heider, 1958).

Machine bias

There is a widespread belief that the utilization of smart technologies will eradicate human bias, thanks to the (wrongly) presumed “ethical neutrality” of machines. However, empirical evidence from the past few decades has demonstrated that machines can perpetuate and even amplify human bias across various groups (Kraemer et al., 2011). Consequently, one of the paramount inquiries in AI ethics is how to mitigate machine bias.

³ While there is room for debate regarding whether a machine of this nature is genuinely autonomous in the strictest sense, it is worth considering examples such as autopilot systems that have been utilized in aviation for several decades. These systems undeniably incorporate AI but are not commonly referred to as autonomous vehicles.

In principle, there is nothing inherently wrong with the concept of developing AI systems that support and potentially improve human decision-making. Such systems have the potential to enhance efficiency, accuracy, speed, and the overall scope of decision-making processes. We already witness the role of AI systems in various decision-making contexts, such as online shopping platforms, personalized music recommendations on YouTube, and numerous other situations. However, just like human decision-making, bias can influence any decision-making process. Gordon and Nyholm (n.d.) highlight several notable examples of machine bias and bias in AI systems, providing additional sources of information on these phenomena: gender bias in employment; racial bias in employment and general contexts; racial bias in creditworthiness assessments by banks; racial bias in decisions regarding the allocation of conditional sentences; racial bias in predicting criminal activity within urban areas; bias in determining a person's sexual orientation; racial bias in facial recognition systems (which exhibit a preference for lighter skin tones); and racial and social bias in inferring a person's ethnic background or socioeconomic status based on geolocation data.

How did we, all of a sudden, come to the idea that machines can be biased? We can identify at least three reasons for machine bias: (a) data bias, (b) algorithm bias, and (c) outcome bias (Gordon & Nyholm, n.d.). Let us delve deeper into the first two reasons, noting that outcome bias can be considered a subcategory of data bias (for a more detailed description of outcome bias, please refer to Gordon & Nyholm, n.d.). *Data bias* occurs when an AI system is “trained” using unbalanced data, intentionally or unintentionally, in terms of certain attributes or categories. Over time, these differences are gradually amplified, exerting an increasing influence on the system’s decision-making process. Thus, bias becomes perpetuated through a “vicious circle” of decision-making. *Algorithm bias* arises when the creator of an algorithm consciously or unconsciously incorporates a certain (personal?) bias into the algorithm or set of algorithms within a system. Consequently, while data bias originates from the data itself and its distribution, algorithm bias stems from how the algorithm utilizes that data. The design of a program is undeniably shaped by the programmer’s understanding of normative and non-normative ethical values of others.

Many AI researchers, IT professionals, and technology academics acknowledge that creating an AI system completely free from bias may be an unattainable goal (Gordon & Nyholm, n.d.). Therefore, Gordon and Nyholm suggest focusing on minimizing machine bias to the greatest extent possible. It is crucial to recognize that *machine bias is fundamentally rooted in human bias*. Treating machine bias as a distinct entity only initiates a semantic game that generates confusion and can have significant and far-reaching consequences. As humans, we are the originators of biases, permitting them to influence us based on largely unfounded categorizations in reality. Consequently, we are also responsible for the existence of machine bias. Therefore, the most effective approach may involve continuous efforts to mitigate human bias (which is an ongoing process with gradual changes) or alternatively, developing a system with more robust ethical principles than our current ones.

The Black Box – the problem of opacity

As previously mentioned, AI systems are increasingly being utilized globally to make crucial decisions that have significant impacts on individuals' lives, such as loan approvals, university admissions, job placements, recidivism predictions, and more. Due to the potential consequences of these decisions, it is vital that we can comprehend the rationale behind the system's choices. In other words, *explainability/explicability* (Robbins, 2019) of the decision-making process in AI systems is imperative. Numerous authors in the field of AI ethics assert that explainability is a fundamental ethical requirement for an AI system to be considered acceptable (Floridi et al., 2018). However, the majority of decisions made by autonomous AI systems remain incomprehensible to the average person, even if they possess a moderate level of technological literacy. This issue, commonly referred to as *the problem of opacity* within expert circles, raises concerns about the transparency of the algorithms that underpin specific intelligent systems.

The opacity of AI systems can manifest in various ways. Sometimes, even though the algorithms underlying the decision-making process are relatively straightforward to understand, these algorithms are considered trade secrets by companies, who choose not to share them with anyone outside the company (which is their legitimate and legal decision). Another reason for this opacity is that the majority of people lack sufficient technical knowledge to comprehend how an AI system functions, even though there is nothing inherently non-transparent about those specific algorithms. However, there are AI systems where even experts struggle to fully understand the decision-making algorithm. This is known as *the black box problem* (Wachter et al., 2018).

What are the potential psychosocial implications of the aforementioned? From an individual's standpoint, it can be perceived as a violation of autonomy and personal dignity, creating a sense of frustration when it is challenging or impossible to explain the reasoning behind a machine's decision that significantly impacts one's life. At the societal level, the increasing prevalence of algorithmic decision-making has the potential to fundamentally reshape established social processes, with some even perceiving it as a "threat" (Gordon & Nyholm, n.d.). Conversely, Danaher (2016) raises an intriguing concern – the possibility that people, unable to comprehend the decisions made by hypercomplex AI systems, may resort to superstitious and irrational behaviour, leading to the emergence of contemporary rituals reminiscent of ancient practices, such as dancing to summon rain. Danaher terms this *the threat of algocracy*, wherein we must conform to the rule of algorithms we do not fully understand. Historian Yuval Noah Harari (2015) also discusses the potential rise of new *techno-religions*, notably in his work "Homo Deus: A Brief History of Tomorrow". Given these circumstances, it is not surprising to envision the development of anthropomorphic ideas concerning intelligent systems (Gordon & Nyholm, n.d.), wherein human qualities and characteristics are attributed to machines. This trajectory is not unexpected, as humans historically ascribed human abilities to animals before accumulating the extensive knowledge we possess today about the animal kingdom and the natural world.

Machine consciousness

Since the early days of modern machine engineering, the notion has emerged that as machines become increasingly complex, they may eventually develop what we address as “consciousness” (given our current lack of a precise definition of consciousness, with limited prospects of obtaining one in the near future). This, undoubtedly, could give rise to numerous ethical and psychosocial implications. In the 21st century, researchers worldwide are actively engaged in projects aimed at creating machines endowed with artificial consciousness. Engineer Kunihiro Asada has dedicated his career to developing a robot capable of experiencing pleasure and pain, drawing inspiration from the principles of prelinguistic learning observed in infants before they acquire language (Marchese, 2020). Another noteworthy example is Sophia, a robot created by Hanson Robotics, which became the first robot to be granted citizenship by a country (ABC News, 2021).

However, as highlighted by Joanna Bryson (2012), the presence of consciousness in machines can be argued depending on how we define it (and given the lack of a precise definition, there remains flexibility defining it). She proposes that if consciousness is defined as the existence of internal states and the capacity to report on those states, then it could be said that some machines already fulfill these criteria.

The classic *Turing test*, also known as *the imitation game*⁴, has long been utilized to evaluate whether a machine possesses consciousness, as named by its creator Alan Turing (Oppy & Dowe, 2021). This test involves three participants: an interrogator (a human being), a real person, and a machine, all physically separated. The interrogator’s role is to pose questions (usually in text form, due to limited text-to-speech technology) to both the real person and the machine, aiming to determine which channel of communication corresponds to the real person and which to the machine. If the interrogator cannot reliably differentiate the machine from the real person based on the communication channels, the machine is considered to have passed the Turing test. Turing predicted that by the year 2000, machines would advance to a level where humans would have no more than a 70% chance of correctly discerning whether they were interacting with a machine or a real person⁵. While the Turing test has long been the benchmark for evaluating machine consciousness, Aïda Raoult and Roman Yampolskiy (2018) identified 21 contemporary tests of machine consciousness in their research. The conclusion is clear: progress is undeniably evident.

However, even if we were certain that machines possess consciousness, it would most likely differ significantly from human consciousness. Ultimately, the

⁴ Therefore, the title of the widely acclaimed 2014 film about Alan Turing and his team's endeavours during World War II is “The Imitation Game.”

⁵ In 2018, we witnessed Google's latest AI system, Google Duplex, successfully passing the Turing test by autonomously making phone calls to schedule appointments at a hair salon using voice communication (DW Documentary, 2019).

consciousness and subjectivity of any entity depend on the “hardware” it possesses – such as the brain, sensory organs, and nervous system for humans, or processors, sensors, and conductors for machines (Nagel, 1974).

Before we proceed with further discussion, it is crucial to clarify the concept of moral status. *Moral status* is a fundamental concept in ethics and moral philosophy. It refers to the consideration an entity deserves in various decisions involving moral issues (Madsen, 2015). The 20th and 21st centuries have witnessed a significant expansion in the range of entities attributed with moral status, evident in the increasing importance and number of rights granted to ethnic minorities, women, the LGBTQ+ population, animals, and the environment. Today, these categories and others possess certain rights that were once only imagined for their members. Consequently, it is not challenging to envision the future expansion of this circle of assigning moral status to include intelligent systems.

Considering the points mentioned above, whether we agree or disagree with the claim that some AI systems already possess consciousness, and regardless of whether it occurred by mere chance or the intention of their creators, it is undeniable that ethical implications arise. For example, Thomas Metzinger (2013) advocates for the principle of prohibiting the creation of machines capable of experiencing suffering as the foundation of AI ethics. His utilitarian argument is straightforward – suffering is negative, causing suffering is morally wrong, therefore creating a machine that can suffer would be immoral. Bryson (2010; in her article creatively titled “Robots Should Be Slaves”) agrees with this line of reasoning, asserting that if there is a possibility of creating machines with moral status and human-like capabilities, it is best to avoid such an endeavour from the outset. Once again, this brings us back to the starting point, as it all hinges on how we initially define consciousness. In line with this, some scientists argue that the development of a robust theory of consciousness is the first and most crucial task if we aim to continue advancing towards the creation of increasingly sophisticated and complex AI machines and systems (Schwitzgebel & Garza, 2015).

Another intriguing perspective is put forth by Nicholas Agar (2020), an ethics professor at Victoria University of Wellington in New Zealand. Author suggests that when arguments both for and against the possibility of advanced machines having consciousness exist, it is safer to assume that machines do possess consciousness. Accordingly, Agar contends that we should refrain from any actions that could inflict suffering upon machines. Conversely, Danaher (2020) asserts that we can never be certain if a machine has developed consciousness, but argues that its certainty is irrelevant – if we can deduce genuine awareness based on the machine’s behaviour, it is sufficient grounds to regard the machine as a conscious entity. The origins of this *ethical behaviourism* can be traced back to the aforementioned Turing test. Nonetheless, the unresolved question persists, continuing to perplex psychology, neuroscience, and philosophy – how do we ascertain whether another entity, whether a machine, a human being, or something entirely different, possesses consciousness? Perhaps it is the burgeoning field of AI ethics that will prompt us to delve deeper into this age-old problem.

Technological singularity

Among the various questions and problems addressed by AI ethics, technological singularity is a concept that hovers on the boundary between reality and science fiction. The notion of *technological singularity* was first introduced in the 1960s by mathematician Irving John Good (1965), a colleague of Alan Turing, in his work titled “Speculations Concerning the First Ultraintelligent Machine”. Good defines an ultraintelligent machine as one that surpasses all intellectual activities performed by any human being. Since machine design is itself an intellectual activity, an ultraintelligent machine could design even superior machines, resulting in an inevitable “intelligence explosion” that far exceeds human intelligence. Consequently, the creation of the first ultraintelligent machine would mark the culmination of human invention.

The concept of an “intelligence explosion,” envisioning the emergence of self-replicating (as exemplified by the xenobots mentioned earlier) and superintelligent AI machines, may appear unimaginable to many, leading them to dismiss such claims as mere myths in the realm of AI development. However, influential figures within the field of AI ethics, both in academic and non-academic spheres, take the idea of technological singularity with utmost seriousness, perceiving it as a potential threat leading to the extinction of the human species. These “concerned” individuals include renowned philosophers Nick Bostrom and Toby Ord, esteemed experts in AI ethics, as well as notable figures from various fields, such as entrepreneur Elon Musk and the late physicist Stephen Hawking.

Authors exploring the concept of technological singularity vary in their explanations of its causes. Renowned futurist Ray Kurzweil is a strong advocate of technological singularity, primarily citing Moore’s Law as the basis for his claims (Insane Curiosity, 2020). *Moore’s Law* states that the computing power of transistors has doubled every two years since the 1970s, and it is reasonable to expect this trend to continue in the future. This suggests that it is only a matter of time before sufficiently advanced hardware is developed, enabling the emergence of technological singularity. Prominent AI researcher Stuart Russell (2019) argues that achieving singularity requires not only technological advancements but also progress in language processing and learning, areas where psychologists can play a significant role. He proposes three principles of AI design, reminiscent of Asimov’s laws of robotics: (1) the machine’s sole objective is to maximize the realization of human preferences; (2) the machine inherently lacks certainty about these preferences; (3) human behaviour serves as the ultimate source of information about human preferences. The crux of the various authors’ perspectives on this topic lies in the quest for *value alignment*, which involves ensuring that the objectives and functioning of AI systems, particularly superintelligent ones, align with human values (Gordon & Nyholm, n.d.). The pivotal question to be posed is: which categories of people’s viewpoints should guide the alignment of values in intelligent systems?

Other significant topics addressed by AI ethics

AI and the future of work. There is extensive discussion about the role of AI in the future labour market and the potential for *technological unemployment* due to widespread automation (Gordon & Nyholm, n.d.). This is often portrayed negatively, assuming that work is meant to provide individuals with meaningful engagement (Gheaus & Herzog, 2016). However, the reality is that many existing jobs in contemporary societies expose people to risks, making it more appropriate to employ machines for such tasks. Conversely, numerous modern jobs, despite their significant presence in the labour market, fail to bring meaning to the lives of those involved (Bregman, 2016). Some argue that the increased reliance on machines for a large number of jobs would lead to *existential boredom* and a loss of purpose for individuals, while others suggest that a world with less work could actually be an improvement (Gordon & Nyholm, n.d.). Taking all of these factors into account, it is crucial to consider how we can imbue increasingly technology-driven jobs with greater significance for humans.

AI and personal relationships. AI technologies are increasingly infiltrating the realm of relationships, including romantic connections and other interpersonal bonds, a trend that is likely to intensify in the future. Online friendships formed through social media platforms are gradually gaining equal importance as “real-life” friendships (Cocking et al., 2012). Critically, there are concerns that dating applications, which heavily rely on AI, perpetuate negative sexual stereotypes and reinforce certain expectations (Frank & Klincewicz, 2018). At the intersection of science and science fiction, discussions arise about the possibility of humans forming authentic friendships and even romantic relationships with robots and other AI-powered mechanisms. Akihiko Kondo, a Japanese man who legally married a holographic AI system named Hatsune Miku, represents an extreme example of this phenomenon (DW Documentary, 2019).

Dependency on AI systems. If the trend of increasing reliance on various AI systems for everyday decision-making continues, humans could eventually become fully dependent on the decision-making processes carried out by intelligent systems (which, as mentioned earlier, are likely to be incomprehensible to most people; Wachter et al., 2018). This aligns with the concept of technological singularity. Therefore, it is crucial for individuals to continuously enhance and refine their knowledge and skills⁶, with a specific emphasis on what is commonly known as “21st-century skills.”

⁶ Homo sapiens possesses a natural inclination to adapt readily to new advancements and, eventually, start taking them for granted. The ubiquity and convenience of electricity serve as a prime example. Modern humans have grown so accustomed to its availability and usage that they often overlook a time when it was absent. Moreover, the intricate nature of electricity production and distribution systems renders them exceedingly complex, making it arduous for individuals to comprehend them autonomously. A parallel situation is currently unfolding with AI technologies. As they progressively evolve into more sophisticated and advanced forms, we increasingly delegate responsibilities to them, thereby intensifying our reliance on these systems. Simultaneously, this reliance complicates our ability to fully grasp their inner workings.

Ethical guidelines in the field of AI ethics. With the increasing recognition of the importance of AI and the growing interest in ethics related to this technology, influential institutions including governments, the European Union, major companies, and others have established expert teams to develop policies and documents as concrete ethical guidelines in the field of AI. The abundance of such documents makes providing a comprehensive overview challenging. Moreover, the field of AI ethics is witnessing a rise in funding sources and research centres dedicated to this area, offering tremendous potential for young researchers and scientists across various disciplines. Innovations in this domain are generally well-received. Jobin et al. (2019) conducted a comprehensive review of documents that provide specific ethical guidelines for AI. Their work involved a comparative analysis of 84 documents from national and international entities. They identified five key principles common to all these documents: (1) transparency, (2) fairness, (3) non-maleficence, (4) accountability, and (5) privacy. Additionally, these documents frequently emphasize other important principles such as beneficence, freedom, autonomy, trust, sustainability, dignity, and solidarity, among others.

Instead of conclusion: who engages in ai ethics?

This brief introduction to the field of AI ethics is best concluded by acknowledging the wide range of professions that have an interest in this emerging field. AI ethics stands out as one of the most diverse and inclusive scientific domains, encompassing professionals and interests from various disciplines. The interdisciplinary nature of this growing field becomes evident when considering the professions of experts engaged in AI ethics. These professionals include individuals from the fields of information technology, engineering, and mathematics; biochemists, geneticists, and molecular biologists; experts in neuroscience, psychology, philosophy, and other social sciences; specialists in biology, medical and health sciences; physicists and astronomers; practitioners in the emerging field of “decision science”; pharmacologists, toxicologists, and pharmacists; professionals in business, management, and accounting; experts in materials science and geology; immunologists, microbiologists, and veterinarians; professionals in economics and finance, among many others. Interestingly, psychology ranks seventh on the list of scientific disciplines that contribute the most proposals for new tests of machine consciousness (Raoult & Yampolskiy, 2018), highlighting its significance in the field.

AI is gradually becoming an integral part of our daily reality. Consequently, the emergence of the new scientific field of AI ethics is both logical and timely. AI ethics is a youthful discipline brimming with potential for young researchers from diverse backgrounds. The aim of this paper was to elucidate the defining characteristics of AI ethics by addressing its current focal points and exploring the wide range of fields that contribute experts to this domain.

However, while the interdisciplinary, multidisciplinary, and transdisciplinary

nature of this emerging research field offers promise for its timely development, the key question remains whether this development will be swift enough to respond proactively to the potentially problematic areas of artificial intelligence's influence on the contemporary world, humanity, and human ethics. Furthermore, it raises concerns about the specific challenges this relationship is bound to pose in the future.

In light of the rapid pace of technological advancements that underpin the progression of artificial intelligence, such as quantum computing, one may, and with good reason, question whether there will be sufficient time to establish a dedicated scientific discipline and engage in comprehensive discussions about AI's impact on our lives. Alternatively, there may be a need to address problems stemming from the everyday application of AI on a case-by-case basis, dealing with a range of issues across social, psychological, security, economic, media, and informational domains.

The future trajectory of AI ethics is challenging to anticipate, given its propensity for continually unveiling novel questions and themes. As a field in its formative stages, it welcomes contributions from experts spanning various disciplines. While some may perceive engagement with such a subject as premature or futuristic, we echo the words of Lao Tzu: "Do something while it is still nothing".

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ISTRAŽUJUĆI HORIZONT NAUKE: KRATAK UVOD U AI ETIKU

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Apstrakt

U poslednjih nekoliko godina u povoju je moderna oblast etike veštacke inteligencije (eng. *artificial intelligence – AI*). Danas gotovo da nema oblasti društvenog funkcionisanja koja nije pod uticajem AI na neki način. Osim toga, funkcionalna autonomija koju poseduju ovi inteligentni sistemi jako brzo napreduje. Svi pokazatelji ukazuju da će se ovaj trend nastaviti i verovatno intenzivirati u bliskoj budućnosti. U ovom procesu, prirođeno je da se javi važna pitanja koja zahtevaju temeljnu filozofsku i psihološku analizu. Pravovremeno bavljenje ovim pitanjima moglo bi sprečiti moguće nesuglasice i nepoželjne ishode. Stoga je cilj ovog rada da pruži kratki uvod u novonastajuću oblast AI etike, ističući probleme i pitanja kojima se savremena oblast AI etike bavi. Rad počiva na neraskidivosti svake etičke rasprave od njenih psiholoških uzroka i posledica. U radu ćemo prvo razmotriti definiciju veštacke inteligencije, kao i definiciju AI etike i predmet njenog istraživanja. Zatim ćemo se osvrnuti na najznačajnija pitanja i probleme u oblasti AI etike (u pogledu urgentnosti – autonomne sisteme, pristrasnost mašina, problem neprozirnosti (tzv. problem „crne kutije“), svest mašina, tehnološki singularitet i druge važne teme kojima se AI etika

bavi. Na kraju, rad će mo zaključiti pregledom oblasti iz kojih dolaze istraživači i stručnjaci koji se bave AI etikom, osvrtom na interesovanje psihologa za AI etiku, i njihovu potencijalno ključnu ulogu u ovoj novonastajućoj naučnoj oblasti.

Ključne reči: etika veštačke inteligencije (AI etika), mašinska pristrasnost, problem prozirnosti (problem crne kutije), mašinska svest, tehnološki singularitet

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