

The Role of Gender and Age in Shaping Attitudes toward Artificial Intelligence

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Abstract— The aim of this study was to examine the relationship of age and gender with positive and negative attitudes toward artificial intelligence (AI) in a sample from Serbia and the surrounding region, in order to assess the presence of significant differences and associations, as well as their consistency with findings from previous studies. The research was conducted on a convenience sample of 238 participants from Serbia and region countries, aged 18 to 67 years ($M = 29.25$, $SD = 9.24$). The results showed weak and significant association between age and negative attitudes, and significant differences between men and women in positive attitudes toward AI, whereas men expressed higher levels of positive attitudes. These findings suggest a potential role of cultural factors in shaping attitudes toward AI, which is consistent with the findings of previous studies.

Keywords— attitudes toward artificial intelligence, age, gender, correlation, differences

I. INTRODUCTION

A. Artificial intelligence (AI)

Alan Turing is considered one of the founders of theoretical computer science and a pioneer of artificial intelligence [1]. He was the first to introduce the concept of a universal machine, as well as to establish a formal foundation for understanding the limits of computability [2]. Later, [3] proposes the Turing Test as an experimental criterion for assessing whether a machine can exhibit intelligent behavior indistinguishable from that of a human. He also introduces the idea of a “*child machine*”, referring to a simple system that gradually develops intelligence through learning and experience.

Artificial intelligence as a scientific discipline was formally established in the mid-20th century, when early researchers sought to conceptualize the possibility of creating intelligent machines. Throughout its development, numerous definitions have emerged, each highlighting certain aspects of artificial intelligence [4]. In the paper presented at the Dartmouth Conference, a key assumption was put forward: that every aspect of learning and intelligence can be described with sufficient precision to be simulated by a machine [5]. Accordingly, artificial intelligence is implicitly understood as a field aimed at developing systems capable of processes such as language understanding, abstraction, problem-solving, and self-improvement.

With the development of AI, new definitions have also emerged. For example, according to [6], artificial

intelligence is defined as the science and engineering of creating intelligent machines, particularly intelligent computer programs. Within this approach, intelligence is viewed as the computational aspect of the ability to achieve goals in real-world environments [6]. Such a definition indicates that artificial intelligence does not necessarily have to imitate human intelligence, but can instead employ various formal and algorithmic methods for problem-solving. Artificial intelligence is a highly complex, multidimensional construct that enables machines to imitate complex human skills [7].

Based on the above, it can be concluded that artificial intelligence is indeed a complex construct that, in line with the development of other technologies, expands into various areas of interest, and that no single definition can encompass all aspects and domains of its application.

B. Attitudes toward AI

Attitudes can be understood as a psychological predisposition to evaluate a specific object, person, or concept with a certain level of approval or disapproval [8]. In [9], the authors, prior to the aforementioned definition, proposed an umbrella definition of attitude consisting of evaluation, object, and tendency, which together function to assess attitude objects in terms of the degree to which they are preferred or not preferred.

Attitudes can also be directed toward artificial intelligence, and as established in [9], such attitudes may be positive or negative. According to the original authors of the instrument for measuring attitudes toward AI, titled “*General Attitudes towards Artificial Intelligence Scale*” (GAAIS), attitudes toward artificial intelligence are operationalized as a construct encompassing cognitive evaluations, emotional reactions, and assessments of the benefits and risks associated with the use of artificial intelligence [10].

The authors of the GAAIS scale [10], across several of their studies, advocate for a two-dimensional approach. The first dimension refers to positive attitudes toward artificial intelligence, while the second dimension refers to negative attitudes. Based on this assumption, the GAAIS scale was constructed so that 12 of its items measure positive attitudes, and 8 measure negative attitudes toward artificial intelligence [10].

C. Age and gender and their significance in assessing attitudes towards AI

In a study conducted on a Japanese sample [11], a very weak but statistically significant positive correlation was found between age and negative attitudes toward artificial intelligence, while no statistically significant correlation was found between age and positive attitudes. It is important to note that these findings are weak and inconsistent in their effects. Likewise, two studies [12], indicate a weak relationship between age and attitudes toward AI, with older respondents showing slightly more positive attitudes. However, the effects are small, suggesting a limited influence of age. In addition to these findings, there are also studies that did not find statistically significant results [13], [14], [15]. The second study [16] indicates significant positive associations between age and the acceptance of artificial intelligence in a Chinese sample, whereas in a UK sample, a moderate negative correlation was found with fear of artificial intelligence. In the ANCOVA analysis, age loses its significant role.

Differences in the expression of negative and positive attitudes toward AI with respect to gender were found in a study conducted on a Japanese sample [11], where men expressed more positive attitudes toward artificial intelligence compared to women, while no differences were found in the expression of negative attitudes toward AI. Results from another study indicate that men express more positive attitudes toward AI than women [13]. Also, the study [14] suggests that women express more negative and fewer positive attitudes toward AI compared to men, while another study indicates that men significant higher scores than women only in negative attitudes toward AI [12]. In a study that analyzed attitudes toward AI using the ATAI (Attitude Towards Artificial Intelligence) scale, suggested that men are more inclined to accept artificial intelligence, while no significant differences were found in fear of AI [16]. The Albanian validation of the GAAIS supports that males display more negative and positive attitudes toward artificial intelligence compared to females [15].

Although gender and age are often cited as important predictors of attitudes toward artificial intelligence, their effects are not universal but depend on the cultural context. Research shows that perceptions of AI are shaped by cultural narratives and levels of trust in institutions, which is why the same demographic characteristics can have different effects across societies [17]. Cross-cultural findings confirm that respondents from East Asian countries express more positive attitudes and greater trust in AI compared to Western populations, suggesting that culture can strengthen or weaken the relationship between gender, age, and attitudes toward AI [18]. Considering the inconsistent results of previous studies, it is likely that such differences arise from cultural variations.

D. Aim of the study

Given the findings of previous studies, the aim of this research was to examine the relationship between age and attitudes toward artificial intelligence (AI), as well as to determine whether there are significant gender differences in the expression of positive and negative attitudes toward

AI in a sample from Serbia and other countries in the region with similar cultural backgrounds. This approach enables a more meaningful comparison of the obtained results with those of previous studies conducted in culturally different populations. Additionally, given the relative scarcity of research on attitudes toward AI in the Western Balkan region, particularly studies using GAAIS, this study contributes to addressing this gap and provides a basis for future research in this context.

E. Hypotheses:

Based on the previously presented theoretical explanations and empirical findings, which indicate a lack of clear consistency in certain results as well as the possible influence of cultural differences on these inconsistencies, the following hypotheses were formulated:

H1. There is no statistically significant relationship between age and positive attitudes toward artificial intelligence [11],[13], [14], [15].

H2. There is no statistically significant relationship between age and negative attitudes toward artificial intelligence [13], [14], [15].

H3. There is a significant gender difference in positive attitudes toward artificial intelligence, with men expressing more pronounced positive attitudes compared to women [11], [13], [16].

H4. There are no statistically significant gender differences in negative attitudes toward artificial intelligence [11],[13], [16].

II. METHODOLOGY

A. Procedure

The convenience sample was collected using an online survey administered via the Google Forms platform. Data collection was initially conducted in December 2025 by distributing the survey across various social media groups (e.g., Facebook, Instagram, WhatsApp, and Reddit) that include participants from Bosnia and Herzegovina, Serbia, Croatia, and Montenegro. To increase the sample size and improve representativeness, additional data were collected in March 2026 using the same procedure and distribution channels.

B. Instruments

The General Attitudes toward Artificial Intelligence Scale (GAAIS) is a 20-item instrument used to assess attitudes toward artificial intelligence (Schepman & Rodway, 2020). The scale has demonstrated very good internal consistency ($\alpha > .80$). In this study, the scale was translated into Serbian, and Cronbach's alpha coefficients were examined. The results indicated very good internal consistency for the subscale measuring positive attitudes, as well as good internal consistency for the subscale measuring negative attitudes toward artificial intelligence. The negative subscale consists of 8 items (e.g., "I think artificial intelligence is dangerous"), whereas the positive subscale consists of 12 items (e.g., "Artificial intelligence is exciting").

C. Sample

The sample was a convenience sample and consisted of participants aged between 18 and 67 years, with a mean age of 29.25 and a standard deviation of 9.24 years. Participants came from different countries in the region: 40.76% from Serbia, 39.50% from Bosnia and Herzegovina, 14.28% from Croatia, and 5.46% from Montenegro. The remaining socio-demographic data are presented in Table 1.

TABLE I: SOCIO-DEMOGRAFSKE KARAKTERISTIKE UZORKA

Variable	Category	N	%
Gender	Male	110	46.21%
	Female	126	52.94%
	Does not want to declare	2	.84%
Residence	City	186	78.15%
	Smaller place	35	14.71%
	Village	17	7.14%
Age	18–24	99	41.60%
	25–34	76	31.93%
	35–44	45	18.91%
	45+	18	7.56%
Country	Serbia	97	40.76%
	Bosnia and Herzegovina	94	39.50%
	Croatia	34	14.28%
	Montenegro	13	5.46%

Note. N = size of the sample.

III. RESULTS

A. Descriptive statistics

At the very beginning, descriptive characteristics of the results on the subscales of positive and negative attitudes toward artificial intelligence, as well as age, were extracted.

TABLE III: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

Variables	M	SD	R	zSk	zKu
Positive attitudes toward AI	43.50	7.27	48	-4.32	5.11
Negative attitudes toward AI	28.91	4.96	28	.13	-1.59
Age	29.25	9.24	49	7.44	3.49

Note: M = mean; SD = standard deviation; R = range; zSK = standardized skewness; zKU = standardized kurtosis.

Analysis of the variable distributions, such as positive attitudes toward AI and age, showed that the standardized values of the skewness and kurtosis coefficients both significantly exceeded the threshold of ± 1.96 , indicating pronounced positive skewness and elevated kurtosis of the distribution. These results suggest that the distribution deviates from normality. Accordingly, a nonparametric technique was used to assess the correlation between age and attitudes toward AI, specifically Spearman's rank correlation coefficient.

B. Correlation between age and attitudes toward AI

Using Spearman's rank correlation, a statistically significant association was found ($r = -.169$; $p < .01$) between age and negative attitudes toward artificial intelligence, whereas the relationship between age and positive attitudes toward artificial intelligence was not statistically significant. Based on the results of the correlation analysis, it was concluded that the first hypothesis, referring to the absence of a relationship between age and attitudes toward AI, was confirmed, while the second hypothesis, concerning the absence of an association between age and negative attitudes toward AI, was not confirmed.

C. Gender differences in attitudes towards AI

The results of the Mann–Whitney U test indicate that there is no significant difference between men and women in negative attitudes toward artificial intelligence ($U = 6443$, $Z = -0.933$, $p = 0.351$). Women have a slightly higher mean rank (Mean Rank = 122.37) compared to men (Mean Rank = 114.07), but this difference is not statistically significant. For positive attitudes, men have a higher mean rank (Mean Rank = 132.49) compared to women (Mean Rank = 106.29), indicating that men exhibit more positive attitudes toward artificial intelligence. This difference is statistically significant ($U = 5391.5$, $Z = -2.944$, $p = 0.003$). The results clearly indicate that the third hypothesis, stating that males express more positive attitudes toward artificial intelligence, was confirmed too. Also, the fourth hypothesis, stating that females express more negative attitudes toward artificial intelligence, was confirmed.

IV. DISCUSSION

Based on the obtained findings, the first, third and fourth hypotheses were confirmed, while the second hypothesis was not supported.

The first hypothesis, which assumed no statistically significant correlation between age and positive attitudes toward artificial intelligence, was confirmed. This result is consistent with findings from other studies [11],[13], [14], [15]. It is important to note that, in addition to the studies supporting this hypothesis, there are also findings indicating the existence of a significant correlation between age and positive attitudes toward artificial intelligence [12]. Although these effects are relatively weak, differences in the studied populations, particularly in terms of cultural context may contribute to inconsistencies in the results. For this reason, a null hypothesis was formulated.

The second hypothesis, which assumed no significant relationship between age and negative attitudes toward artificial intelligence, was not confirmed. Instead, a significant negative relationship between these two variables was found. These results are consistent with findings from the study [12]. The reason why the hypothesis was not formulated in accordance with these findings lies in the presence of a number of studies indicating the absence of such a relationship between age and attitudes toward artificial intelligence [13], [14], [15]. For this reason, null hypotheses denying the significance

of the relationship between these variables were formulated.

All the aforementioned studies, both those supporting and those not supporting these findings, were conducted on different populations with different cultural backgrounds, which may represent a key reason for the observed differences and inconsistencies in the results. Different cultures imply different worldviews, including attitudes toward artificial intelligence, which further contributes to the observed inconsistency.

The third hypothesis, which assumed that men express more positive attitudes toward artificial intelligence than women, was confirmed. This finding is consistent with previous empirical results [11], [13], [16]. These results clearly indicate that, regardless of possible cultural differences, such findings are relatively consistent across populations, and that in Serbia and countries of the region, as in other populations, the tendency to hold positive attitudes toward artificial intelligence is more pronounced among men than among women.

The fourth hypothesis assumed that there are no significant gender differences in the expression of negative attitudes toward artificial intelligence. This hypothesis was confirmed. These findings are consistent with previous research [11], [13], [16]. One possible explanation is that gender differences in negative attitudes toward AI are generally weak or non-significant, making them more susceptible to cultural influences and broader historical or contextual factors.

The main limitation of this study is the lack of a full validation of the GAAIS in Serbia, Bosnia and Herzegovina, Croatia, and Montenegro. Accordingly, future studies are recommended to conduct a complete psychometric validation of this scale.

The convenience sampling method, sample size, and the use of self-report methodology represent additional limitations. The results would be more representative if obtained from a larger randomly selected sample. Furthermore, the self-report method limits the results due to the possibility of socially desirable responding, low motivation, and selecting responses without carefully reading the questions, which represents a clear limitation of this measurement approach. Future studies are therefore encouraged to develop or further refine existing measurement instruments in order to obtain more precise results, as well as to apply them to larger and randomized samples.

V. CONCLUSIONS

The results of this study clearly indicate a significant negative relationship between age and negative attitudes toward artificial intelligence, with older individuals exhibiting less pronounced negative attitudes toward AI compared to younger individuals. Additionally, significant gender differences were found in the expression of positive attitudes toward artificial intelligence, with men being significantly more inclined to express positive attitudes. These findings suggest that the population in Serbia and the broader region shows notable similarities to other European populations, but also important differences that may point to the influence of cultural factors. Overall,

these results contribute to a better understanding of the relationship between gender and age and attitudes toward AI, and provide a basis for future research in this field, with the aim of facilitating better alignment between humans and artificial intelligence.

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