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PREDICTORS OF AFFIRMATIVE ATTITUDES TOWARD THE USE OF ARTIFICIAL INTELLIGENCE IN SCIENCE WITHIN A MERTONIAN ETHOS FRAMEWORK

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ABSTRACT

This article examines public attitudes towards the use of artificial intelligence (AI) tools in science, starting from the concept of epistemological rights of citizens and Merton's institutional ethos of science. Various predictors were examined to explain citizens' positive attitudes towards the impact of AI on objectivity, quality, efficiency, judgment, and ethics of scientific practice. Regression analysis showed that significant predictors are sex, age, frequency of AI use, trust in AI tools, and perceptions of similarity between the human brain and computers. Also, the strongest single predictor of affirmative attitudes is the belief that AI can make ethically correct decisions, which indicates the presence of the phenomenon of dataism in a part of the population. Despite general concerns about the possible misuse of technology, citizens express moderate trust in the ability of scientific institutions to use AI tools reliably and ethically, implicitly confirming the credibility of science in the digital age.

KEY WORDS

AI in science, Mertonian scientific etos, digital citizenship, epistemological rights, ethics of AI

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INTRODUCTION

Science and technology are inseparable and unavoidable components of modern society. The latest capabilities of digital technologies based on artificial intelligence (AI) spread not only into our practical actions but also greatly into intellectual ones. AI thereby connects society even more deeply with science [1]. Like any other technology, digital technology (which includes AI) requires not only technical skills for its effective use but also social and ethical norms. These requirements motivated the formation of the concept known as digital citizenship, which provides and prescribes a variety of digital competencies, rights, and responsibilities necessary for active and ethical participation in the online world [2]. The increasing influence of digital technology on the formation and distribution of knowledge and information has also opened specific issues of epistemological rights as the fundamental right of all citizens to access, critically evaluate and use true information and knowledge. Epistemological rights initially represent an essential precondition for democratic independence and citizen engagement in the digital age [3]. This approach aims to equip citizens with the key competencies needed for democratic culture, responsible participation and understanding of their digital environment, but in the context of AI this becomes problematic mainly due to its extremely complex algorithmic work, which is not entirely clear and predictable even to its creators, and especially for the broader non-expert citizenry. The question arises whether such a tool can be used in a controlled and reliable manner and what attitude digital citizens have towards it. This question may be important when establishing norms and competencies for this tool. In this article, questions are raised about the reliable use of AI tools within the scientific community and about citizens' perceptions of such use.

DIGITAL CITIZENSHIP

The concept of digital citizenship has taken on various definitions and domains over time, and has expanded from its early educational frameworks, such as Ribble and Bailey's [4] nine norms of behavior related to the use of technology, to the Council of Europe's [2] ten digital domains that focused on safety and digital literacy. However, in a modern digitalized society which generates more and more data that is not a real picture but a duplicate of the world [5], marked by asymmetry of power and surveillance [6], where the concentration of capital and data (Big Data) reinforces existing social inequalities and leads to the 'third-level digital divide' [7], there is a need for the concept of radical digital citizenship. This approach shifts the focus from mere acquisition of skills to questioning the structures that shape their digital environment. This means questioning the broader social purposes of digital data instead of accepting it as a neutral truth [8]. In this manner of critical review, epistemic rights assume a key role according to which "society should guarantee that all its citizens will be given truthful information and knowledge and the competence to use these for their own benefit and that of society as a whole" [3]. This refers not only to access to information, but also to the fundamental right of citizens to understand how knowledge is created and verified so that they can make independent, informed decisions [9]. In the digital age, these rights are increasingly threatened by state and commercial actors, so epistemic institutions have a duty to provide citizens with true information and knowledge [3]. Since science represents a public good and produces socially useful and reliable information [10] , it has become one of the key allies in the realization of citizens' epistemic rights. However, with the expansion of the use of AI tools in science, the question arises of how AI affects the processes of creating and distributing scientific knowledge, with it, the epistemic rights of the wider citizenry. Understanding citizens' attitudes towards AI tools in science therefore represents their position within this cognitive ecosystem. Along these lines, this article proposes three indicators of digital competence of citizens: familiarity with AI tools, frequency of use of AI tools, and reasons for

not using AI tools. These elements directly correspond to some dimensions of the European Digital Citizenship Framework [2], primarily locating themselves in the domains of 'Being online' and 'Rights online'. The frequency and manner of using digital technology, including AI tools, are an indicator of citizens' ability to actively participate and implement those tools with an informed and competent understanding. Specifically, familiarity with AI tools and frequency of use can be placed in the dimensions of 'literacy skills' and 'access', which represent contextual principles for digital citizenship and democratic culture and enable the realization of 'informational principles' [2], i.e., epistemic rights.

In this article, attention is also given to exploring the possible reasons why some individuals choose not to use AI tools such as perceptions of uselessness, distrust, fears and concerns. These barriers reflect challenges in the 'Privacy and security' and 'Health and well-being' dimensions, which relate to personal protection and awareness of online actions, and psychological aspects related to digital technology [2]. Public awareness of the scope and purpose of mass data collection and algorithmic decision-making is often limited, and citizens express general confusion and uncertainty about how digital systems work [11]. Although scientists have greater technical expertise to evaluate AI tools, the research deliberately focuses on the general population. Citizens' attitudes are precisely central to the digital citizenship framework, which presupposes not expert knowledge but the ability of the non-expert public to form judgments about the reliability and ethical use of technologies by these epistemological institutions. Lower levels of technical knowledge of AI tools in this context do not represent a methodological limitation but an empirical condition under which trust in scientific institutions takes on general social proportions. Because of "the rapidly changing and multiplying forms of disinformation, and the increasing role of AI in our daily lives [which] requires ever more knowledge and skills" [12; p.213] we are looking for current views on the use of AI tools in science and and what they are related to.

INSTITUTIONAL ETHOS OF SCIENCE

The elements of scientific practice that were analyzed were taken from the Mertons [13] sociology of science, who considers science primarily a social institution. Like any institution, science needs supervision and control of motivations and behavior to establish order and achieve its institutional purpose - the expansion of certified knowledge. For this purpose Merton formed a normative structure of science consisting of (1) universalism, which requires the subjection of all intellectual actions of scientists to impersonal criteria of rationality, (2) communalism, which requires that scientific findings have to be treated openly and transparently as the product of collaboration and therefore communal, (3) disinterestedness, which protects the quality of research from the personal interests of researchers, and (4) organized skepticism, which requires the temporary suspension of judgment and a distanced examination of scientific facts. For the purposes of this article, which is embedded in the broader context of AI and in order to adapt the concepts and make them clearer to the research population, the variables (1) objectivity, (2) efficiency, (3) quality, and (4) reasoning were formed, with an additional variable about (5) ethics. Using the above variables, a criterion variable of positive attitudes towards AI in science was constructed in the model. Objectivity implies the application of universal and subjective impression-independent criteria in assessing the truth of claims. That corresponds to Merton's norm of universalism which "is rooted deep in the impersonal character of science" [11; p.270]. Next, efficiency is connected to the norm of communalism, which emphasizes the collective nature of scientific knowledge and its availability to the wider community. When this norm is met, the distribution of knowledge is greater and more complete, which directly enables a more efficient development of science. Next, quality corresponds in part to Merton's norm of disinterestedness. Although

disinterestedness can easily be equated with objectivity or impartiality, it actually refers to the scientist's personal gain. It talks about the prestige that science enjoys through its professional language – "The borrowed authority of science bestows prestige on the unscientific doctrine" [11; p.277]. This norm serves as a protection against situations in which the personal interests of scientists, whether due to rewards or ideology, could ignore the quality of the research process [14]. Citizens cannot have direct insight into the interests of researchers, but if their work still appear to them to be of high quality in the context of AI, it can mean that the eventual interests of AI and the scientists themselves have not impaired the quality of their work at a level that would be noticeable to the general public. Next, reasoning is connected to the norm of organized skepticism, which mandates the temporary suspension of judgment and the critical scrutiny of beliefs based on empirical and logical criteria. The scientist's ethics variable represents a kind of overall approach that generally enables the realization of the ultimate institutional purpose of science – "the extension of certified knowledge" [11; p.270]. Since scientists, as well as other users, do not have full control over AI tools, a legitimate question arises, can AI tools be used ethically in scientific research? Therefore, it is necessary to point out already some of the problems regarding each of our norms. Objectivity and thus the norm of universalism is threatened through the fundamental mismatch between the formal rationality of AI and substantial human rationality, which can lead to systematic errors when processing value-laden data [15]. The same problem is then transferred to efficiency and thus to the norm of communalism, which requires compliance with moral and cognitive norms in order to preserve the integrity of science [16]. At the same time, it is known that AI easily creates systemic inequality in the visibility of knowledge through ranking designs, thus favoring some sources over others and preventing the uniform and proper distribution of scientific knowledge. For example, according to Laurito et al. [17] large language models (LLMs) show a clear preference for communicating and selecting content generated by other LLMs over content created by humans, thus reducing the availability of most original scientific works. Quality and the norm of disinterestedness are also compromised through algorithmic bias because they are "trained on general and unimaginably large data sets with human feedback, [and therefore] present challenges in identifying and addressing bias" [18]. Finally, judgment and the norm of skepticism are compromised when "summarizing scientific texts, [since] LLMs may omit details that limit the scope of research conclusions, leading to generalizations of results broader than those warranted by the original study" [19; p.1]. It is precisely considering these problems that we can reflect on the growing epistemological awareness of our public. In order to further deepen interpretation of the results given the aforementioned threats, presented variables will be compared with few other variables from the research, such as general concern about the misuse, or unethical use of AI tools, which represent the dimensions of 'Ethics and Empathy' and 'Rights and Responsibilities' in the Well-being online domain. To distinguish between the ethics of human use of AI tools and the ethics of the algorithm itself more clearly, we will also check the attitudes about the very possibility of AI to make ethically correct decisions. This directly problematizes the reliability of automated decision-making and points us to the problem of 'dataism', which Van Dijck [20] sees as an ideology of belief in the ethics, impartiality, and objectivity of automated decision-making. While the term "trust" in this context denotes the willingness to practically rely on the functional suitability and safety of AI tools, "beliefs" and "attitudes" denote mere intellectual convictions about its capabilities. Also, on the issue of objectivity, which in Merton's norm of universalism speaks of impersonal criteria of rationality, it is necessary to distinguish between substantial and formal rationality [15]. Due to the abstract nature of the concept of rationality, in this regard, the attitude towards the difference between the functioning of the human brain and the functioning of computers was measured. It is precisely such a worldview that could make a significant difference in attitudes towards the impact of AI on objectivity in science.

LITERATURE REVIEW – EXISTING RESEARCH

Although in recent years, particularly since 2022, when ChatGPT became widely available and popular, there has been a rapid increase in scholarly and scientific publications on the use and role of AI, especially in the social sciences, empirical research on this topic within the Croatian academic community is virtually nonexistent. The corpus of available studies narrows further when focusing specifically on the role of AI in scientific research. Consequently, this review will primarily rely on international studies.

Based on the literature, it can be stated that AI, including machine learning (ML) and deep learning (DL), has become a significant tool in contemporary scientific research, affecting all stages of the research process, from hypothesis formulation to data analysis [21-23]. However, it is important to distinguish between AI and machine learning (ML). AI can be defined as the capability of artificial systems to perform tasks requiring human cognitive abilities, such as problem-solving, reasoning, and communication [24], whereas machine learning is a subset of AI that enables learning from data to make predictions and improve efficiency [21, 22].

Although AI promises increased efficiency in scientific work, its application simultaneously raises important questions regarding research reliability, algorithmic interpretability, and the need for human judgment to remain central in the scientific process. Several factors are particularly relevant in this context, notably ethical, methodological, and sociodemographic considerations.

Generative AI (GenAI) carries specific ethical risks as it can produce "factually incorrect responses", including so-called hallucinations [25]. Studies indicate that tools such as ChatGPT should not be relied upon for citing scientific literature, as they may generate inaccurate or nonexistent references [25]. Consequently, excessive reliance on AI may negatively affect academic innovation and the development of critical thinking [25]. There is also general concern regarding the so-called "black box" effect, which refers to the lack of transparency and explainability in AI algorithms [22, 26]. Due to the complexity of deep learning models, even researchers themselves may sometimes be unable to explain how an algorithm arrives at its decisions [22].

Authorship is another increasingly important issue, as generative AI blurs the boundary between content created by humans and content generated by machines [25, 27]. Nevertheless, human judgment appears to be irreplaceable, in line with the "Human-in-the-Loop" (HITL) concept [21, 28]. AI should function as a tool that supports and facilitates researchers' work rather than replacing them [27]. The human mind remains essential for critical thinking, understanding causal relationships, interpreting results, and developing theories [27, 29].

Numerous studies show that positive attitudes toward and trust in AI are significantly influenced by sociodemographic characteristics (such as gender, age, and frequency of use) as well as certain institutional factors.

The use of AI in scientific and civic contexts demonstrates that sociodemographic factors, including gender and age, as well as AI literacy levels, significantly shape users' attitudes and practices. Research consistently shows that men are more frequent users of AI tools, hold more positive attitudes toward them, and report higher self-assessed AI literacy compared to women, while women are more likely to express concerns regarding risks, security, and privacy [24, 30]. Similarly, user age affects trust in and frequency of AI use: younger individuals and senior students generally show higher adoption and trust in AI, whereas older professionals with more than five years of experience tend to exhibit more positive attitudes and higher knowledge levels, likely due to their professional adaptation [24, 30, 31].

A key factor shaping attitudes toward AI is AI literacy. Individuals with a better understanding of AI who use it frequently are more likely to hold positive attitudes and trust the technology, and they are better equipped to critically evaluate AI tools and use them responsibly [30, 32]. This competency is not only important for the individual but also affects the broader capacity of users to shape knowledge creation in scientific and civic contexts. For instance, AI use can transform the ways in which citizens and researchers influence the knowledge production process [33].

Awareness of the importance of human judgment further strengthens positive attitudes toward AI, especially when it is used as a tool to support and augment human work rather than replace it [27]. In short, sociodemographic factors, AI literacy, and the design of AI systems collectively shape not only the frequency of use and user attitudes but also the ethical and epistemological potential of this technology in scientific and civic contexts [27, 32, 33].

Perceptions of AI's ability to make ethically sound decisions are strongly linked to institutional trust. Trust in AI acts as a "psychological mechanism to reduce uncertainty" and is a critical prerequisite for technology adoption [26].

Although a large majority of the public (70% globally) supports AI regulation, fewer than half of respondents (43%) believe that existing laws and regulations provide sufficient protection [32]. The lack of institutional training and guidelines for responsible AI use further hinders transparent technology adoption; for example, only 11.4% of medical researchers report having access to adequate training [30, 34]. Therefore, it is crucial for institutions to develop clear guidelines to ensure the ethical and transparent integration of AI into research practice [30].

RESEARCH AIM

The aim of this article is to analyze how the public perceives the impact of AI tools on the fundamental norms of scientific institutions by relating them to variables of digital citizenship and the impact of AI tools on the ethos of science. The research question is: What is the direction and relative strength of the effects of the predictors – gender, age, frequency of AI tool use, familiarity with AI tools, reasons for not using AI tools, concerns about the misuse of AI tools, its possibility of making ethically correct decisions and difference between human and computational rationality – in explaining the criterion variable affirmative attitudes about the use of AI tools in science.

METHODOLOGY

For the purposes of this research, a survey was conducted on a sample of 500 citizens of the Republic of Croatia. A more detailed description of the sample characteristics is provided in the Introduction. Several questions from the survey questionnaire were used for the analysis, specifically those related to the topic of this article. In this article, the term "artificial intelligence" refers to a broader understanding of generative artificial intelligence and large language models (LLM) (such as ChatGPT, Gemini, etc.), since they represent the forms of artificial intelligence that are the most accessible and recognizable to the general public.

PREDICTORS

The dimensions of digital citizenship were examined by the following questions. The first question, *How often do you use different AI tools?* (further in the text: *frequency of AI use*), was measured on a five-point scale: *I do not use them at all; rarely (a few times a year); sometimes (a few times a month); often (every week or daily); and I'm not sure*. The second

question, *How familiar are you currently with the possibilities of using artificial intelligence tools?* (further in the text: *familiarity with AI possibilities*), was also measured on a five-point Likert scale: *I am not familiar at all; I am slightly familiar; I am somewhat familiar; I am very familiar; and I'm not sure*.

Next, we used a question for description of reasons for not using AI tools, *If you do not use AI tools at all, please select the reasons*. Respondents were able to indicate which of the five listed statements were applied to them. For the purposes of the analysis, each of these statements was treated as a binary predictor variable coded as 1 (the reason applies to me) or 0 (the reason does not apply to me). The statements were: *I am not sufficiently familiar with AI tools* (further in the text: *lack of familiarity with AI*)*; I do not trust AI tools* (further in the text: *trust in AI*)*; I have certain fears and concerns related to AI tools* (further in the text: *fears and concerns about AI*)*; I do not consider AI tools useful for my needs* (further in the text: *perceived usefulness of AI tools*)*; I am not interested in AI tools* (further in the text: *interest in AI tools*).

In addition to the mentioned variables, the research covered a number of other topics among which we will look for additional explanations of the obtained attitudes about the impact of AI on scientific research, such as the attitudes: *There is a great similarity between the work of the human brain and the work of computers* further in the text: *similarity between brain and computer*), *Artificial intelligence tools can make ethically correct decisions* further in the text: *AI ethical decision-making*), and *I am concerned about the potential misuse of artificial intelligence tools* further in the text: *concerns about AI misuse*). All variables were formulated as statements rated on a five-point Likert scale*: I completely disagree*; *I mostly disagree*; *I neither agree nor disagree*; *I mostly agree*; *I completely agree*.

CRITERION

Finally, two socio-demographic questions were also included as predictors in the analysis: sex (coded as 1 for men and 0 for women) and age, which was treated as a quantitative variable.

Finally, the variables of scientific ethos: objectivity, quality, judgment, efficiency and ethics, are expressed in the questionnaire through next items: *I think that using AI tools helps scientists be more objective in their work*; *I think that using AI tools helps scientists achieve better-quality results*; *I think that AI tools help scientists make more cautious, evidence-based conclusions*; *I think that AI tools help scientists access other researchers' studies more easily*; *I think that scientists use AI tools ethically in their work*. All items were formulated as statements rated on a five-point Likert scale*: I completely disagree*; *I mostly disagree*; *I neither agree nor disagree*; *I mostly agree*; *I completely agree*.

Given the stated research aim and the planned statistical analyses, the responses to these five statements were summed for each participant to create a composite index (a non-refined factor score). This index served as the criterion variable named *affirmative attitudes about the use of AI tools in science*. An exploratory factor analysis confirmed that the five items form a unidimensional structure, with a Kaiser-Meyer-Olkin measure of 0,867 and a significant Bartlett's Test of Sphericity ($\chi^2 = 1465{,}4$; df = 10; $p = 0{,}000$). The communalities ranged from 0,536 to 0,798. The extracted factor accounted for 70,1% of the total variance. Additionally, Cronbach's alpha indicated satisfactory internal consistency of the items ($\alpha = 0{,}893$).

The statistical analyses used in this study included descriptive statistics to provide an overview of respondents' answers, exploratory factor analysis, and Cronbach's alpha to assess the dimensionality and internal consistency of the items, and finally, linear regression analysis to address the stated research aim. All analyses were conducted using the statistical software SPSS (version 20).

RESULTS

USE OF AI TOOLS

Examining the basic patterns of AI tool use among the respondents in this research, the results show that the largest proportion (54,5%) use such tools at least a few times per month or more frequently, on a weekly or daily basis. In contrast, 23,6% of respondents reported that they do not use AI tools at all. As previously described, respondents who do not use these tools were able to indicate their reasons for non-use. The most frequently selected reason (14,0%) was a lack of sufficient familiarity with AI tools, whereas the least common reason (4,0%) was having certain fears or concerns related to AI and perceiving AI tools. Other reasons were reported to the following extent: lack of interest in AI tools (7,8%); lack of trust in AI tools (6,2%); and perceiving AI tools as not useful (5,8%).

ATTITUDES ABOUT THE USE OF AI TOOLS IN SCIENCE

When examining the individual statements regarding the use of AI tools in science, which together form the criterion variable "affirmative attitudes about the use of AI tools in science", Table 1 shows that respondents do not differ substantially in their level of agreement with any specific statement. The mean values for all items range between 3,3 and 3,5 out of a maximum of 5. The absence of more pronounced variation among the items further supports the calculation of a composite index based on their scores. Furthermore, as shown in Figure 1, the largest proportion of respondents mostly or completely agree that the use of AI tools in science can facilitate researchers' access to the work of other scientists (58,8%), while the smallest proportion of respondents agree that scientists use AI tools in an ethical manner in their work (41,7%).

Table 1. Descriptive indicators of attitudes about the use of AI tools in science.

	N	Mean	SD	Median
I think that using AI tools helps scientists be more objective in their work	500	3,3	1,0	3
I think that using AI tools helps scientists achieve better-quality results	500	3,5	1,0	4
I think that AI tools help scientists make more cautious, evidence-based conclusions	500	3,3	1,0	3
I think that AI tools help scientists access other researchers' studies more easily	500	3,5	1,0	4
I think that scientists use AI tools ethically in their work	500	3,3	0,9	3

PREDICTORS OF ATTITUDES ABOUT THE USE OF AI TOOLS IN SCIENCE

After gaining an initial overview of respondents' attitudes toward the use of AI tools in science, the next part of the analysis focuses on results related to the research aim. A correlational analysis and a multiple linear regression were conducted to examine the relationships between the previously described criterion variable and the set of predictors. As shown in Table 2, affirmative attitudes toward the use of AI tools in science (the criterion) exhibit statistically significant but relatively weak associations with the predictors, except for age. The strongest positive correlation is found between attitudes and the belief that AI can make ethically sound decisions ($r = 0,5$), while the strongest negative correlation is observed between attitudes and trust in AI tools ($r = –0,23$). Both predictors were also significant in the regression model, as discussed further in the text.

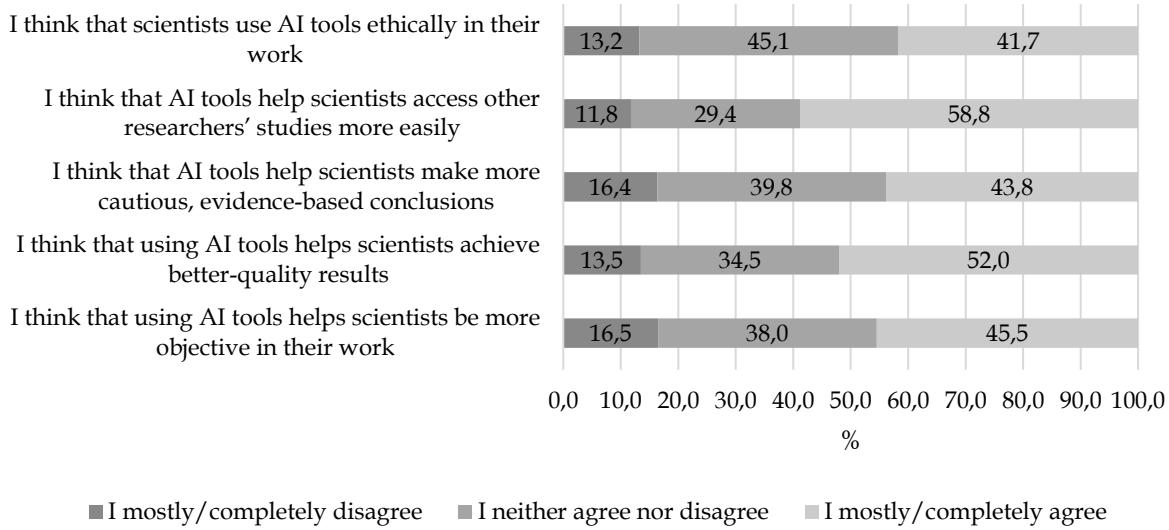

Figure 1. Level of agreement with statements on the use of AI tools in science.

Table 2. Correlation between affirmative attitudes about the use of AI tools in science and the predictors.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Affirmative attitudes about the use of AI tools in science (1)	1	0,09*	0,05	0,29*	0,14*	-0,09*	-0,23*	-0,15*	-0,17*	-0,12*	0,33*	0,5*	0,08*
Sex (2)		1	0,18*	-0,1*	-0,1*	0,08*	0,02	0,01	0,04	0,03	0,07	0,01	-0,08*
Age (3)			1	-0,33*	-0,34*	0,26*	0,08*	0,05	0,07	0,11*	-0,1*	-0,08*	0,05
Frequency of AI use (4)				1	0,62*	-0,56*	-0,37*	-0,3*	-0,35*	-0,41*	0,15*	0,32*	0,03
Familiarity with AI possibilities (5)					1	-0,61*	-0,19*	-0,21*	-0,11*	-0,14*	0,11*	0,24*	-0,01
Lack of familiarity with AI (6)						1	0,27*	0,34*	0,17*	0,09*	-0,1*	-0,18*	-0,01
Trust in AI tools (7)							1	0,4*	0,36*	0,23*	-0,07*	-0,24*	0,05
Fears and concerns about AI (8)								1	0,21*	0,21*	-0,12*	-0,16*	0,09*
Perceived usefulness of AI (9)									1	0,3*	-0,08*	-0,15*	-0,03
Interest in AI tools (10)										1	-0,05	-0,17*	0,05
Similarity between brain and computer (11)											1	0,35*	-0,08*
AI ethical decision-making (12)												1	-0,07
Concerns about AI misuse (13)													1

*significant at the 0,05 or 0,01 level (1-tailed)

Using the obtained regression model, 35,1% of the variance in the criterion variable was explained (adjusted R^2 = 33,5%), and the overall model was significant (F(12, 480) = 21,664; p = 0,000). The enter method was applied, resulting in twelve predictor variables being included in the model. The predictors that reached statistical significance are presented in Table 3.

Both socio-demographic variables proved to be significant predictors of affirmative attitudes toward the use of AI tools in science. More specifically, the analysis showed that men exhibit affirmative attitudes that are 0,1 points higher compared to women (t = 2,10; p = 0,04). Additionally, age was also significant: each one-year increase in age is associated with a 0,1-point increase in affirmative attitudes (t = 3,04; p = 0,00).

Beyond socio-demographic variables, five additional predictors were significant. The first was the frequency of AI tool use (β = 0,24; t = 4,05; p = 0,00), indicating that an increase of one level in usage frequency corresponds to a 0.24-point increase in affirmative attitudes of using AI in science. The next predictor showed the same direction but a smaller effect: (lack of) familiarity with AI tools (β = 0,12; t = 2,38; p = 0,02). Since this was a binary variable, the model indicates that individuals who report not being sufficiently familiar with AI tools (and therefore do not personally use them) nevertheless express more affirmative attitudes toward the use of AI in science compared with those who consider themselves sufficiently familiar. In other words, a lack of familiarity with AI tools on a personal level does not appear to impede holding positive views about their use by scientists. Next, the model shows that individuals who lack personal trust in AI tools express less affirmative attitudes toward their use in scientific contexts compared to those who do have trust (β = –0,09; t = –1,98; p < 0,05).

Furthermore, the predictor related to the perceived similarity between the human brain and a computer was also significant in a positive direction (β = 0,18; t = 4,51; p = 0,00), indicating that greater agreement with this statement corresponds to higher affirmative attitudes toward using AI in science. In addition, the predictor with the strongest contribution to explaining the criterion was the statement regarding AI's ability to make ethical decisions (β = 0,38; t = 9,22; p = 0,00), suggesting that a stronger belief in AI's capacity for ethical decision-making is associated with more positive attitudes toward using AI in science. Finally, the predictor describing concerns about AI misuse also showed a positive relationship (β = 0,12; t = 3,31; p = 0,00), indicating that increased concern about the misuse of AI tools corresponds to higher affirmative attitudes toward using AI in science. A more detailed interpretation of this relationship is provided in conclusion.

To conclude this part, it is necessary to mention, the predictor reflecting (non)familiarity with AI tools showed a statistically significant negative bivariate correlation with the criterion variable (r = –0,09) (Table 2), yet its regression coefficient in the multivariate model was positive (B = 1,42) (Table 3). This pattern is indicative of a partial suppressor effect. To examine the stability of the model, an additional regression analysis was conducted, excluding this potential suppressor. The alternative model explained 34,4% of the variance in the criterion variable (F(11, 481) = 22,900; p = 0,000), and the relative contributions of the significant predictors remained similar, with no change in the direction of their effects. Based on these findings, the model that includes the described predictor was retained for interpretation.

Table 3. Results of the multiple regression analysis explaining affirmative attitudes toward the use of AI tools in science.

	B	Std. Error	Beta	*t*	Sig.
Constant	4,94	1,22		4,03	0,00
Sex (male)	**0,64**	**0,31**	**0,08**	**2,10**	**0,04**
Age	**0,03**	**0,01**	**0,12**	**3,04**	**0,00**
Frequency of AI use	**0,85**	**0,21**	**0,24**	**4,05**	**0,00**
Familiarity with AI possibilities	–0,07	0,25	–0,02	–0,29	0,78
Lack of familiarity with AI	**1,42**	**0,60**	**0,12**	**2,38**	**0,02**
Trust in AI tools	**–1,42**	**0,72**	**–0,09**	**–1,98**	**0,05**
Fears and concerns about AI	–0,58	0,85	–0,03	–0,68	0,49
Perceived usefulness of AI	–0,32	0,73	–0,02	–0,44	0,66
Interest in AI tools	0,69	0,64	0,05	1,09	0,28
Similarity between brain and computer	**0,57**	**0,13**	**0,18**	**4,51**	**0,00**
AI ethical decision-making	**1,58**	**0,17**	**0,38**	**9,22**	**0,00**
Concerns about AI misuse	**0,51**	**0,15**	**0,12**	**3,31**	**0,00**

CONCLUSION

This research focuses on science as an important epistemic institution whose purpose is to expand certified knowledge. This issue is particularly highlighted by the expansion of AI, which unpredictably changes cognitive processes and calls into question the reliability of scientific knowledge. The article analyzed how Croatian citizens perceive the impact of AI on various aspects of scientific practice, which not only indicates certain aspects of the relationship between science and society, but presumably also about the epistemological awareness of that society. The research focused on assessing five aspects of scientific practice (objectivity, quality, efficiency, judgment, and ethics), formed based on Merton's ethos [13], and sought to explain citizens' attitudes using the predictors of digital citizenship, sociodemographics and certain cognitive-ethical attitudes.

Respondents expressed moderately affirmative attitudes towards the impact of AI on scientific practice, with average scores ranging from 3,3 to 3,5 (of max 5) for all items examined. This medium level of confidence may indicate a possible balanced awareness and caution towards the epistemological obstacles that AI inevitably introduces scientific cognitive processes. Therefore, citizens currently, with a dose of criticism, predominantly see the impact of AI on science positively. The highest agreement was recorded in areas related to 'efficiency' (easier access to scientific research) and 'quality' (achieving better results), both with an average score of 3,5. This indicates the recognition of AI as a tool that supports the norm of communalism [13], accelerating the collaboration and distribution of scientific knowledge. However, this increase in efficiency must be aligned with the moral and cognitive norms of the scientific ethos to preserve the integrity and trust in science [16], and the most critical point of public perception is precisely the ethical dimension of the use of AI tools. The lowest agreement was obtained for the ethical use of AI by scientists (average 3,3, with 41.7% affirmative responses). This ethical skepticism is significant because it could signal that the public probably recognizes the inherent moral and cognitive uncertainty of the algorithms themselves, regardless of the actors who use them. Finally, AI should function as a tool that supports and facilitates researchers' work rather than replacing them [30], particularly because, due to the complexity of deep learning models, even researchers themselves are sometimes unable to explain how an algorithm arrives at its decisions [22]. The noticeable epistemological caution of citizens is fully consistent with existing theoretical insights about the dangers, including the threat to

objectivity due to the discrepancy between formal and substantive rationality [15], the impairment of organized skepticism due to inappropriate content summarization [19], and the norm of disinterestedness due to algorithmic bias [18].

Given the theoretical framework and statistically high correlation of these five aspects of scientific practice (objectivity, quality, efficiency, reasoning and ethics), they were summed up into a unique composite index called 'affirmative attitudes about the use of AI tools in science', which served as a criterion variable in further analyses. In a multivariate regression model (R^2=35,1%), firstly, although weak, the sociodemographic variables of gender and age were found to be statistically significant predictors of affirmative attitudes towards the use of AI in science where men express more affirmative attitudes compared to women. This is consistent with other research, which consistently shows that men use AI tools more frequently, hold more positive attitudes toward them, and report higher self-assessed AI literacy compared to women, whereas women are more likely to express concerns regarding risks, security, and privacy [27, 33]. Furthermore, age is positively correlated with affirmative attitudes, which contrasts with common models of the digital divide that attribute greater technological literacy and greater trust in technology to younger generations [24, 30, 31]. A possible explanation for such a result is that older generations, regardless of digital literacy, may have a higher level of institutional trust in science as such, which acts as compensation for the perceived risks of the tool itself, what should be examined in greater detail in future studies.

Regarding the predictors of digital citizenship, only the frequency of AI use proved to be the significant predictor. That is, a higher level of active use is positively correlated with trust in the ability of science to use these tools reliably. Such a result also points to a possible charismatic genesis of the authority of AI tools, which acquires and develops present trust mainly through direct contact with citizens, a phenomenon that requires further research. The most complex finding concerns the role of insufficient familiarity with AI tools, which in the correlation analysis was negatively associated with affirmative attitudes, but in the multivariate regression model showed a statistically significant positive coefficient. In this case, it seems that trust is not anchored in the tool itself, but in the institutional integrity of science that is capable of overcoming the shortcomings of AI, which also remains a question for future research. A similar conclusion is suggested by the lack of any connection between general concerns about potential misuse of AI tools and affirmative attitudes towards the use of AI in science, including the ethical use of AI by scientists, which suggests that citizens perceive the scientific institution as an ethical corrective factor in the digital society. Despite awareness of the dangers that AI poses outside the academic sphere (e.g., in surveillance, commercialization) [11], the public trusts the institutional ability of scientists to manage these risks responsibly and successfully. The general high concern did not lead to specific concerns about science and thus indicated the belief that scientists possess the necessary organized skepticism to overcome algorithmic biases and moral dilemmas. In this way, citizens implicitly confirm that science, in their opinion, retains its credibility in spreading certified knowledge, even in conditions of algorithmic uncertainty.

The predictor with the highest standardized coefficient in the entire model is the belief that AI tools can make ethically correct decisions. Such a strong association of trust in the intrinsic moral power of the algorithm, independent of user oversight and control, can be explained by the phenomenon of 'dataism' [20], which represents the belief in the impartiality and objectivity of automated AI decision-making, which creates the danger of uncritical acceptance of data logic as neutral truth. Furthermore, a significant positive contribution to affirmative attitudes is also made by agreement with the idea that the work of the human brain and computers is similar. If citizens equate inherently subjective human rationality (substantive) with logic based on big data (formal), they perceive the difference only in degree, not in kind.

Such a 'computational turn' which means a change in the logic of cognition according to which knowledge obtained computationally from big data is reliable and objective [35], in the context of further progress in AI, suggests a potential loss of epistemological awareness. This loss of critical distinction undermines the ability to understand how knowledge is created and verified, which is the basis for exercising epistemic rights.

Overall, the results show that citizens have a predominantly positive view of AI-supported science. According to citizens, science is succeeding in fulfilling its institutional purpose despite technological challenges of which they are somewhat aware. Future research should focus on the ambivalence revealed in this article. It would be useful to examine within the scientific community itself the same set of views, but also to what extent the use of AI may also be realizing anti-Mertonian norms (such as particularism or organized dogmatism). Only with repeated and more extensive tests of the public's trust in scientists can the question of whether science will be able to maintain trust in the long term and thus secure the epistemological rights of our digital citizenry be fully answered.

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