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# NEUROTICISM AND ARTIFICIAL INTELLIGENCE ANXIETY. THE MEDIATING ROLE OF CORE SELF-EVALUATION

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## Abstract

Through a quantitative approach, this paper investigates the relationship between Neuroticism and Artificial Intelligence Anxiety and the mediating role of Core Self-Evaluation in this relationship. As AI technologies become deeply embedded in various sectors such as social media, smart devices, healthcare, and education, understanding how people perceive and interact with Artificial Intelligence is progressively essential. A total of 297 participants, consisting of 32 males and 165 females, completed surveys measuring their Neuroticism, Artificial Intelligence Anxiety, and Core Self-Evaluation levels. The data were collected via Google Forms using the following structured questionnaires: Neuroticism Scale, Artificial Intelligence Anxiety Scale, and Core Self-Evaluation Scale. Results showed significant positive correlations between Neuroticism and Artificial Intelligence anxiety ($r=-.301$, $p<.01$) suggesting that individuals with higher levels of AI anxiety are inclined towards adopting more skeptical viewpoints regarding AI technologies. Moreover, three of the four Artificial Intelligence anxiety subscales (job replacement, $r=-.178$, $p<.05$; sociotechnical blindness, $r=-.208$, $p<.01$, and Artificial Intelligence configuration, $r=-.166$, $p<.05$) also showed negative significant correlations with the attitudes toward AI. At the same time, Core Self-Evaluation showed significant negative correlations with the composite score of Artificial Intelligence anxiety ($r=.304$, $p<.01$) and all its subscales (learning, $r=-.304$, $p<.01$; job replacement, $r=-.181$, $p<.05$; sociotechnical blindness, $r=-.236$, $p<.01$, and Artificial Intelligence configuration, $r=-.218$, $p<.01$). Furthermore, Core Self-Evaluation was found to be a strong mediator between Neuroticism and Artificial Intelligence Anxiety. Understanding the role of AI anxiety and Core Self-Evaluation in shaping attitudes toward Artificial Intelligence can inform the development of strategies to mitigate negative perceptions and foster more positive attitudes toward Artificial Intelligence technologies.

***Keywords:*** *Neuroticism, Artificial Intelligence, core self-evaluation, mediation.*

## 1. Introduction

Grouped under the broad domain of AI, applications such as Machine Learning, Big Data processing, Deep Learning, and Neural Networks have generated significant interest in recent years. Usually defined as a suite of tools and technologies designed to augment and enhance organizational performance (Alsheibani, Cheung, & Messom, 2018), the rapid expansion of AI-based technologies has heightened public awareness as companies continuously seek new ways to increase their businesses and profit (Bourne, 2019).

Decisions regarding the introduction and implementation of AI-based technologies will predominantly be made by influential stakeholders, such as large corporations and governments rather than individual users (Chen & Wen, 2021; Jones, Kaufman, & Edenberg, 2018). The inevitable impact of AI on society is evident, as highlighted by various authors (Makridakis, 2017). This impact may take various forms, ranging from optimism and hope (Kieslich, Lünich, & Marcinkowski, 2021) to significant challenges (Wang & Wang, 2019).

## 2. Literature review

Neuroticism reflects a person's tendency to adopt a negative cognitive style and focus on their negative aspects (Watson, 2000). Barlow and his collaborators emphasize that "neuroticism is typically defined as the tendency to experience frequent and intense negative emotions in response to various

stressors" (Barlow et al., 2014, pp. 344-345). The spectrum of negative emotions is broad, with the authors (Barlow et al., 2014) observing that this perspective generally encompasses "anxiety, fear, irritability, anger, sadness (…) although the strongest emphasis has been placed on the experience of anxious or depressive mood states" (Barlow et al., 2014, p. 345).

According to Barlow and his colleagues (2014), the prevailing view of the world as a dangerous place, combined with limiting beliefs about an individual's ability to confront challenging events, consistently aligns with the heightened negativity characteristic of neuroticism (Barlow et al., 2014). Additionally, Costa and McCrae (1992) and Goldberg (1993) assert that neuroticism refers to individual differences in negative emotional responses to threats, frustration, or loss. Lahey (2009) points out that factor analyses have revealed substantial correlations among the elements operationally defining neuroticism, which include irritability, anger, sadness, anxiety, worry, hostility, self-consciousness, and vulnerability (Lahey, 2009, p. 241). Furthermore, Widiger (2009) notes that individuals with high levels of neuroticism manage environmental stress poorly, perceive ordinary situations as threatening, and may view minor frustrations as overwhelming or hopeless.

Core self-evaluation (CSE) represents a person's fundamental and subconscious appraisal of their worth, competence, and capabilities (Judge, Locke, & Durham, 1997). Iqbal (2012) highlights that "people with high core self-evaluation (CSE) feel confident and think positively of themselves, whereas those with low self-evaluation tend to lack confidence" (Iqbal, 2012, p. 132). According to Judge and colleagues (1997), core self-evaluation (CSE) is a construct representing a broad dispositional trait composed of four specific characteristics: self-esteem, generalized self-efficacy, emotional stability (low neuroticism), and locus of control (Judge et al., 1997).

An integrative perspective on the effects fostered by a high core self-evaluation (CSE) is offered by Judge and Kammeyer-Mueller (2011), who emphasize that "people with positive core self-evaluations (CSE) view themselves positively across various situations and approach the world with confidence and self-assurance. They believe they are capable of solving problems (high self-efficacy), deserving of respect and esteem (high self-esteem), in control of their circumstances (internal locus of control), and tend to be optimistic, free from doubt and worry (high emotional stability)" (Judge & Kammeyer-Mueller, 2011, p. 332).

Characterized by a strong sense of control over their own lives, individuals with positive core self-evaluations (CSE) tend to view themselves favorably concerning challenging situations they may encounter, confidently believing in their ability to overcome any obstacle they face (Stumpp et al., 2010). Conversely, individuals who assess themselves negatively display low self-confidence, perceive themselves as less capable than others, and often focus on their shortcomings or failures while adopting a victim mentality (Judge et al., 1997).

Bernazzani (2017) observed that AI technologies will likely replace various jobs, especially those categorized as 3D – dumb, dirty, and dangerous. The increasing reliance on AI may lead to a loss of meaning as human work is substituted by automation. Moreover, individuals may be compelled to change careers and upgrade their skill sets. Supporting this, Manyika and colleagues from the McKinsey Global Institute (2017) estimated that “by 2030, 75 million to 375 million workers (3 to 14 percent of the global workforce) will need to change occupational categories” (p. 4). While these changes are anticipated to enhance economic productivity (Wang & Wang, 2019), they also raise concerns and anxieties about the future development and application of AI. This anxiety, related to current or future interactions with AI technologies and accompanied by negative thoughts regarding these interactions (Rosen & Weil, 1990), is termed AI anxiety. Johnson and Verdicchio (2017) define AI anxiety as fear or unease from worrying about AI becoming uncontrollable. Although earlier studies (Wang, 2007) have shown that anxiety associated with AI technology can either hinder or encourage future behavioral intentions, Johnson and Verdicchio (2017) highlighted that the emotional response of anxiety or fear may deter individuals from engaging with A. Based on the findings from the literature review, the following hypotheses were selected (Figure 1):

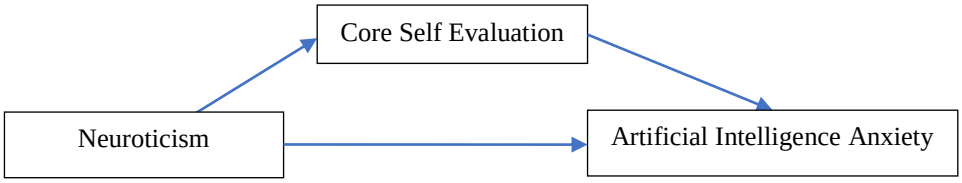
Hy1: Neuroticism negatively correlates with Core Self Evaluation

Hy2: Core Self Evaluation negatively correlates with Artificial Intelligence Anxiety

Hy3: Neuroticism positively correlates with Artificial Intelligence Anxiety

Hy4: Core Self Evaluation mediates the relationship between Neuroticism and Artificial Intelligence Anxiety

*Figure 1. Conceptual framework.*




## 3. Methods

The sample comprised 197 participants, including 32 males and 165 females, aged between 18 and 55 years, with a mean age of 20.59 years (SD = 5.87). Data collection utilized a purposive convenience sampling method and a self-reported data collection technique. Participants received a brief explanation of the study's objectives before completing the survey, and informed consent was obtained. Confidentiality of their data was assured, with the information used exclusively for research purposes.

Participants completed a series of questionnaires, which included the following measures: the Artificial Intelligence Anxiety Scale (Wang & Wang, 2019), the Core Self-Evaluation Scale (Judge et al., 2003), and the Neuroticism Scale (Eysenck & Eysenck, 1968).

The Artificial Intelligence Anxiety Scale (AIA) (Wang & Wang, 2019) consists of 21 items (e.g., "I am afraid that widespread use of humanoid robots will take jobs away from people") across four subscales: learning, job replacement, sociotechnical blindness, and AI configuration. Responses are measured on a seven-point Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree). For the current sample, the internal consistency coefficient was $\alpha = .938$.

The Core Self-Evaluation Scale (Judge et al., 2003) includes 12 items (e.g., "I am confident I get the success I deserve in life"). Responses are distributed on a five-point Likert scale, with one representing “Strongly disagree" and five representing "Strongly agree." For this sample, the internal consistency coefficient was $\alpha = .828$.

The Neuroticism Scale (Eysenck & Eysenck, 1968) comprises 12 items (e.g., "I am often troubled by feelings of guilt"). Responses are recorded on a five-point Likert scale, where 1 signifies "Strongly disagree" and 5 indicates "Strongly agree." The composite score achieved a Cronbach's Alpha of $\alpha = .917$.

## 4. Results

The analysis was conducted using SPSS 26.0 software and the PROCESS macro version 3.2.02 developed by Andrew Hayes (Preacher & Hayes, 2004). Table 1 presents an overview of the means, standard deviations, and bivariate correlations for all study variables. The results indicate several significant positive and negative correlations.

The findings reveal that Neuroticism negatively correlates with Core Self-Evaluation (r=-.622**, p<.01), thereby confirming our first hypothesis. This aligns with the observation that individuals with high neuroticism scores tend to hold limiting beliefs about their ability to manage demanding or challenging situations (Barlow et al., 2014), in contrast to the confidence and self-assurance experienced by individuals with high CSE (Judge et al., 2003).

*Table 1. Descriptive statistics and inter-correlations of the study variable.*

| | Mean | SD | 1 | 1.a | 1.b | 1.c | 1.d | 2 | 3 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Artificial Intelligence Anxiety | 83.64 | 24.11 | - | | | | | | |
| 1.a Learning | 23.19 | 10.82 | .790** | - | | | | | |
| 1.b Job replacement | 30.29 | 8.42 | .790** | .337** | - | | | | |
| 1.c Sociotechnical blindness | 18.20 | 5.50 | .810** | .433** | .713** | - | | | |
| 1.d AI configuration | 11.94 | 5.54 | .802** | .542** | .548** | .600** | - | | |
| 2. Core Self Evaluation | 39.16 | 7.27 | -.304** | -.304** | -.181* | -.236** | -.218** | - | |
| 3. Neuroticism | 41.04 | 10.70 | .301** | .219** | .250** | .226** | .277** | -.622** | - |

**p<0.01; *p<0.05

The second hypothesis (Hy2: Core Self Evaluation negatively correlates with Artificial Intelligence Anxiety) was also confirmed by the results (r=-.304**, p<.01). Therefore, elevated levels of

AI-related anxiety are negatively linked to the ability to solve problems, self-trust and confidence, and internal locus of control (Judge & Kammeyer-Mueller, 2011).

Concerning the third hypothesis (Hy3: Neuroticism positively correlates with Artificial Intelligence Anxiety), the results indicated a significant positive correlation ($r = .301$, $p < .01$) between Neuroticism and AI Anxiety (Table 1). This relationship can be attributed to traits commonly associated with neuroticism – the tendency to experience frequent and intense negative emotions such as anxiety, fear, irritability, and sadness (John & Srivastava, 1999). Several factors contribute to AI-related anxiety, particularly among those with high levels of neuroticism. One key factor is the complexity of AI technologies, which often function in ways that are not fully understood by the general public. This, combined with the "black-box" nature of many AI systems, contributes to a sense of uncertainty (Pellegrino, 2015). Furthermore, concerns about job displacement due to automation can be particularly troubling for those who worry and perceive AI's future as overwhelming or hopeless.

The fourth hypothesis (Hy4: CSE mediates the relationship between Neuroticism and Artificial Intelligence Anxiety) was tested using the PROCESS macro developed by Andrew Hayes (Preacher & Hayes, 2004). The model included Neuroticism as the predictor variable, Core Self-Evaluation (CSE) as the mediator, and Artificial Intelligence Anxiety as the outcome variable (Figure 1).

*Table 2. Regression results for the mediation process.*

| Model | Coeff. | SE | t | p | CI(lower) | CI(upper) |
|---|---|---|---|---|---|---|
| Without mediator | | | | | | |
| Neuroticism -> AI Anxiety (c) | .6777 | .1539 | 4.4051 | .0000 | .3743 | .9811 |
| With mediator | | | | | | |
| Neuroticism -> CSE (a) | -.4225 | .0381 | -11.0810 | .0000 | -.4977 | -.3473 |
| CSE -> AI Anxiety (b) | -.6329 | .2861 | -2.2118 | .0281 | -1.1972 | -.0685 |
| Neuroticism -> AI Anxiety (c') | .4103 | .1945 | 2.1100 | .0361 | .0268 | .7939 |

In the first step of the analysis, the regression of Neuroticism on AI Anxiety, ignoring CSE, is significant, $F(1,195) = 19.40$, $p < .01$, $R2 = .09$, $b = .67$, $t(195) = 4.40$, $p < .01$. The second step of the mediation model shows that the regression of the Neuroticism on CSE, is significant, $F(1,195) = 122.78$, $p < .01$, $R2 = .38$, $b = -.42$, $t(195) = -11.08$, $p < .01$. The third step of the mediation process shows that CSE, controlling for Neuroticism is also significant, $F(2,194) = 12.34$, $R2 = .11$, $p < .05$, $b = -.63$, $t(194) = -2.21$, $p < .05$. The last step reveals that controlling for CSE, Neuroticism is a less significant predictor of AI Anxiety, $b = .41$, $t(194) = -2.11$, $p < .05$.

## 5. Conclusion

The current study aimed to explore the impact of Neuroticism on AI anxiety using a quantitative approach. Additionally, it examined the mediating role of CSE in the relationship between Neuroticism and AI anxiety. The findings revealed a significant positive correlation between Neuroticism and AI anxiety and negative ones between CSE and Neuroticism, as well as between CSE and AI Anxiety, in line with results from previous research, indicating that individuals with higher levels of neuroticism are more likely to experience heightened anxiety concerning the development and implementation of AI technologies (Kieslich, Keller, & Starke, 2022).

Despite the significant findings of this study, several limitations must be acknowledged. A key limitation is the use of a cross-sectional design, which hinders the ability to establish cause-and-effect relationships. Additionally, the small sample size restricts the generalizability of the results. Future research should explore the role of self-esteem, self-efficacy, and locus of control in shaping AI Anxiety to help the development of strategies to mitigate negative perceptions and foster more positive attitudes toward AI technologies.

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