





Prediction of Wisdom Based on Executive Function, Attachment Style, and Personality Traits

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ABSTRACT

Objective: The current research aimed to predict wisdom based on executive function, attachment style, and personality traits.

Methods and Materials: This was a descriptive and correlational study. The study population consisted of all students at Wasit University in Iraq. The sample comprised 350 students selected based on inclusion and exclusion criteria. The research tools included the Ardelit Wisdom Scale (2003), Executive Function (Yousefi & Golkar, 2020), Personality (Costa et al., 1998), and Parental Attachment Style (Armsden & Greenberg, 2000). The collected data were analyzed using stepwise regression.

Findings: The results of the analysis indicated that all dimensions of executive function were positively and significantly related to wisdom. All personality traits, except for extraversion, showed a positive and significant relationship with wisdom ($p = .0051$). All dimensions of attachment were significantly related to wisdom, with secure attachment to parents being positively significant ($p = .000$) and insecure attachment to parents being negatively significant ($p = .000$). Neuroticism, insecure attachment with parents, and increased hours spent in the virtual environment were negatively and significantly related to wisdom, while the remaining variables had a positive and significant relationship. Stepwise regression results showed that among the variables studied, initiation, organization, monitoring, secure attachment to mother, secure attachment to father, inhibition, emotional control, and insecure attachment to father had predictive power for wisdom.

Conclusion: Based on these results, it can be concluded that changes in these variables are associated with changes in wisdom among students.

Keywords: Wisdom, Executive Function, Attachment Style, Personality.

1. Introduction

For many young people who are interested in pursuing higher education, entering university and experiencing student life is a crucial period. This period, despite its challenges, is fruitful and enriching and marks the beginning of better days for some youths, while for others, it comes with more difficulties (Baharluoei et al., 2021). Transitioning from high school to university decreases family supervision, which allows young people to start a period of greater independence and freedom; they are less obligated to explain their behaviors to their families, can spend more time with their friends, and have the opportunity to meet people from various cultures (Alsubaie et al., 2019). However, these opportunities can also come with threats such as addiction, academic decline, probation, risky sexual experiences with the opposite sex, and overall risky experiences that may confront one's career and academic success with numerous difficulties or even deviate one from a normal life path (Ribeiro et al., 2018).

Therefore, it seems that one of the important constructs that can help these students to have better and more fruitful experiences during their university years is wisdom (Ardelt, 2003). Wisdom is a combination of personality traits with three broad dimensions: cognitive, reflective, and affective; the presence of all three dimensions is necessary for an individual to be considered wise. The cognitive dimension represents the desire to know the truth and to achieve a deeper understanding of life, including accepting the contradictory aspects of human nature, the limitations of knowledge, and the unpredictability of life (Rejali & Yousefi, 2021). To achieve this deeper understanding of reality, one must first reflect on one's own agency, i.e., instead of tending to blame others, one should reflect on one's own situation. The reflective dimension indicates self-examination, self-awareness, and the ability to view phenomena from different perspectives, while the affective dimension is defined as compassionate and caring love for others, which reflects a sympathetic and positive attitude towards others (Ardelt, 2003).

Meanwhile, it appears that wisdom is not a construct that one can suddenly be equipped with (Pedramnia & Yosefi, 2018), and one of the factors that can be related to it is executive function (Doebel, 2020). Executive functions have various roles and tasks that are influential in all individuals of any age, gender, and depending on age, the strength and health of functioning in life. Organization, decision-making, working memory, transformational memory, motor control,

sense and perception of time, future forecasting, reconstruction, internal language, and problem-solving are among the most important executive functions that help in life, learning, and cognitive performance (Baggetta & Alexander, 2016).

Although brain functions are important, the power of personality in wisdom cannot be ignored. A common perspective in the field of personality relates to trait theories, and among these, one of the most famous theories is the Big Five personality theory. These five factors (neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness) provide a framework for explaining individual differences in personality. Neuroticism is a dimension that is based on the chronic experience of desirable emotions; extraversion includes traits such as being social, decisive, active, and fond of others; openness to experience describes individuals who are receptive to experiences for the sake of the experience itself, interested in variety, tolerate ambiguity, and have richer, more complex, and unconventional lives (Aghaziarati et al., 2023; Komarraju et al., 2009). Conversely, individuals who are not open to experience seem to have weak imaginations, are not sensitive to art and beauty, have limited emotions, are behaviorally rigid, and ideologically dogmatic. Agreeableness emphasizes interpersonal inclinations. By definition, an agreeable person is kind, empathizes with others, and is eager to help them; conscientiousness encompasses a sense of duty and the need for achievement and organization (McCrae & Costa, 2021; McCrae et al., 1998).

While personality can facilitate or hinder wisdom, early relationships with primary caregivers are also recognized as determinants of many subsequent variables, known as attachment style (Mojoodei et al., 2018; Saadati et al., 2020). Attachment refers to the emotional relationship between a child and an adult caregiver. Thus, attachment behavior is an inclination in the child that is demonstrated to the caregiver (Dehghanpoor Varnamkhasti & Yousefi, 2021; Parsakia et al., 2023; Shadanloo et al., 2023). The main sign of attachment behavior is that the child seeks care from their caregiver or someone with whom they have a close relationship, and is anxious in their absence. Bowlby uses the term attachment behavior not only to respond to a child's separation from the caregiver but also as a natural reaction to any disturbance. According to Bowlby (1969), attachment occurs when there is a warm, intimate, and lasting relationship between a child and a mother that is satisfying and joyful for both. Attachment theory is not just a

developmental theory for children but also a developmental theory across the lifespan. Knowing that there is someone who cares about the person and keeps them in mind, at any age and under any circumstances, provides a secure base for the individual. According to Bowlby, attachment relationships are always present and active throughout the life cycle, such that attachment bonds are formed in adulthood and influence significant adult activities. Following researchers like Bowlby and Ainsworth, three attachment styles were identified in children: secure, insecure-avoidant, and insecure-ambivalent, which were later confirmed in adults (Parsakia et al., 2023; Shadanloo et al., 2023). Secure, avoidant, and ambivalent individuals employ completely different strategies for regulating emotions and processing emotional and cognitive information. In secure attachment, they use cognitive-emotional regulation strategies that minimize stress and activate positive emotions. Additionally, individuals with insecure-avoidant and ambivalent attachment styles utilize cognitive-emotional regulation strategies that focus on negative dimensions, either suppressing emotional and cognitive experiences (avoidant) or causing situations to be experienced as more stressful (Fraley & Roisman, 2019).

In any case, the importance of wisdom in young people has a significant impact on shaping a healthier life and a more effective future, which compels researchers to study its correlates. The results of such research can help design packages to improve and correct wisdom. Various studies have explored wisdom on the role of wisdom in the family (Rejali & Yousefi, 2021); on the relationship between cognitive abilities and self-efficacy with wisdom (Barzegar et al., 2021); on the relationship between wisdom and successful intelligence (Ghorbani & Khormae, 2016); and on the relationship between wisdom and academic vitality (Zabihi Hesari et al., 2017). However, until the writing of this article, no published research had addressed the prediction of wisdom based on executive performance, parental attachment style, and personality traits. Therefore, the current research aimed to answer the question of whether it is possible to predict the wisdom of students based on executive function, attachment style, and personality traits.

2. Methods and Materials

2.1. Study Design and Participants

This study was descriptive and correlational in nature; the study population consisted of all students at Wasit University. The sample size was determined based on

Tabachnick and Fidell's (2013) recommendation of 15 individuals per variable and sub-variable (total wisdom score, 9 scores for executive function and its dimensions, 5 scores for personality, 4 scores for attachment), totaling 285 individuals needed for the study. However, due to potential attrition, the sample size was increased to 350. The sampling method was convenience sampling from different faculties at Wasit University. The research unit for this study comprised students from Wasit city in the academic year 2023-2024. The inclusion criteria were: a minimum age of 18 years, no severe physical disability. The exclusion criteria included: lack of mental health as assessed by an initial interview, very low (outlier) scores which were handled using SPSS and the data trimming option, and no drug addiction which was checked by a question at the beginning of the surveys.

The sample consisted of 350 students from Wasit University in Iraq; questionnaires were distributed in groups among the students who were asked to return them after completion. Students were instructed to answer the questions honestly and completely.

2.2. Measures

2.2.1. Wisdom

This questionnaire was developed by Ardel (2003) and consists of 34 items divided into three subscales: cognitive (14 questions), reflective (12 questions), and affective (13 questions), used to assess wisdom. The questionnaire is scored on a 5-point Likert scale ranging from "strongly disagree" (5 points) to "strongly agree" (1 point). Additionally, certain items are scored on a 5-point Likert scale where "completely true about me" scores 1 and "not at all true about me" scores 5. Higher scores indicate the presence of cognitive, reflective, and affective wisdom traits, and the average of the three dimensions represents the overall wisdom score. In Ardel's research on the validity and reliability of this scale, Cronbach's alphas for the cognitive, reflective, and affective dimensions were 0.71, 0.75, and 0.66 respectively in a student sample, and 0.78, 0.75, and 0.74 in an elderly sample. The overall Cronbach's alpha for the three dimensions was 0.72 in the student sample and 0.66 in the elderly sample (Ardel, 2003). Rejali and Yousefi (2021) in Iran reported internal consistency above 0.80 (Rejali & Yousefi, 2021). In the present study, the Cronbach's alpha was above 0.70.

2.2.2. *Executive Function*

This questionnaire was originally designed to assess various aspects of executive functions, particularly targeting the anterior prefrontal cortex and the posterior frontal lobe areas. It was initially developed for children and adolescents aged 5-18 years. Yousefi and Golkar (2020) adapted this questionnaire for adults and verified its validity and reliability. The questionnaire, containing 86 items, is scored on a five-point scale from "strongly agree" to "strongly disagree." Major executive functions assessed include inhibition, initiation, emotional control, active memory, organization, and monitoring. Reliability coefficients for executive function subscales such as inhibition ($\alpha = 0.91$), initiation ($\alpha = 0.81$), emotional control ($\alpha = 0.91$), among others, were reported (Javanbakht & Yousefi, 2022). Internal consistency for each subscale was recalculated in this study.

2.2.3. *Personality Traits*

This self-report inventory is based on the well-known five-factor model of personality, consisting of neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Each domain contains six facets, representing specific personality traits that reflect different aspects of each domain. The revised version of the NEO Personality Inventory includes 240 items (8 items for each of the 30 facets or 48 items for each of the five domains). Responses are rated on a five-point scale from "strongly disagree" to "strongly agree." A short version containing 60 items is also available based on factor analysis. The validity of this questionnaire has been confirmed through repeated use by researchers both domestically and internationally. In Iran, the Cronbach's alpha for each of the five factors was found to be above 0.60. Yousefi et al. (2011) confirmed the factor validity of each dimension (Yousefi et al., 2011).

2.2.4. *Attachment Styles*

Developed by Armsden and Greenberg (1987), this questionnaire contains 67 items scored on a five-point Likert scale from "strongly disagree" (1) to "strongly agree" (5), assessing secure and insecure attachment styles to parents. The developers provided Cronbach's alphas for each subscale, all above 0.78. Construct validity was examined through factor analysis (Armsden & Greenberg, 1987). Mojoodi, Yousefi, and Turkkan (2018) reported Cronbach's alphas for each subscale of parental attachment above 0.75 (Mojoodi et al., 2018). In this study, internal consistency was recalculated for subscales related to attachment to father ($\alpha = 0.80$) and mother ($\alpha = 0.70$).

2.3. *Data analysis*

Multiple and stepwise regression analyses were conducted using SPSS for data analysis.

3. Findings and Results

Descriptive results of demographic characteristics indicated that 60% of participants were between twenty to thirty years old, with the remainder older than thirty. There were 123 males and 127 females. 75% of participants were married, and the rest were single. Preliminary analysis using Spearman's correlation showed no significant relationship between demographic variables and wisdom.

To investigate the research question: Can executive function, attachment style, and personality traits predict wisdom? Multivariate regression using a stepwise method was employed.

Table 1 presents descriptive statistics of research variables.

Table 1

Descriptive Statistics

Predictor Variables	Mean	Standard Deviation	Wisdom	Significance
Inhibition	61.15	5.86	0.533	<0.001
Direction	45.84	7.75	0.620	<0.001
Emotional Control	35.61	7.14	0.564	<0.001
Initiation	26.61	6.09	0.601	<0.001
Active Memory	40.41	7.48	0.667	<0.001
Planning	43.45	5.83	0.548	<0.001
Organization	4.27	22.49	0.654	<0.001
Monitoring	30.67	4.99	0.610	<0.001
Neuroticism	34.42	10.03	-0.423	<0.001
Extraversion	45.02	9.96	0.045	0.051

Openness	43.45	11.40	0.290	<0.001
Agreeableness	44.23	11.37	0.259	<0.001
Conscientiousness	39.09	10.94	0.220	<0.001
Insecure Attachment to Father	29.33	10.65	-0.509	<0.001
Secure Attachment to Father	63.57	8.63	0.505	<0.001
Insecure Attachment to Mother	26.82	10.52	-0.560	<0.001
Secure Attachment to Mother	49.77	22.11	0.654	<0.001

The findings in Table 1 indicate that all dimensions of executive function, all dimensions of personality except extraversion, and all dimensions of attachment are significantly related to wisdom. The relationship for secure

attachment to parents is positive, and for insecure attachment to parents, it is negative and significant. Stepwise regression analysis was used to identify the most significant factor among these in predicting wisdom.

Table 2

Stepwise Regression Analysis for Predicting Wisdom Based on Predictor Variables

Step	Variables Entered into Equation	Regression Coefficient	Squared Coefficient	Net Share	F-Value	df1	df2	Significance
1	Initiation	0.667	0.445	0.445	276.98	1	345	<0.001
2	Organization	0.776	0.601	0.156	134.73	1	344	<0.001
3	Monitoring	0.824	0.679	0.076	82.49	1	343	<0.001
4	Secure Attachment to Mother	0.848	0.719	0.040	49.11	1	342	<0.001
5	Secure Attachment to Father	0.863	0.745	0.026	34.05	1	341	<0.001
6	Inhibition	0.870	0.757	0.012	18.08	1	340	<0.001
7	Emotional Control	0.873	0.762	0.005	6.89	1	339	<0.001
8	Insecure Attachment to Mother	0.875	0.766	0.004	5.62	1	338	0.018

As observed in Table 2, among the variables analyzed, Initiation entered the regression equation first with a regression coefficient of 0.445 and was able to predict 44.5% of the variance in wisdom ($p < .001$). In the second step, Organization entered the regression model with a coefficient of 0.601, and this variable alongside Initiation was able to predict 60.1% of the variance in wisdom and explained an additional 1.56% of the variance by itself ($p < .001$). In the third step, Secure Attachment to Mother was added with a coefficient of 0.679, and alongside Initiation and Organization, it could predict 67.9% of the wisdom variance, explaining an additional 7.6% of the variance by itself. Monitoring entered in the fourth step, and alongside Initiation, Organization, and Secure Attachment to Mother, was able to predict 71.9% of the wisdom variance, explaining an additional 0.4% of the variance by itself; in the fifth step, Secure Attachment to Father entered the equation

and alongside Initiation, Organization, Secure Attachment to Mother, and Monitoring was able to predict 74.5% of the wisdom variance and explained an additional 2.6% of the variance by itself. In the sixth step, Inhibition entered with a regression coefficient of 0.757, and alongside Initiation, Organization, Secure Attachment to Mother, Monitoring, and Secure Attachment to Father, it could predict 75.7% of the wisdom variance and explained an additional 1.3% of the variance by itself. In the seventh step, Emotional Control entered with a coefficient of 0.762 and was able to explain 76.2% of the wisdom variance alongside other variables, accounting for an additional 0.5% of the variance by itself. Finally, in the eighth step, Insecure Attachment to Mother entered the model with a coefficient of 0.766 and was able to predict 76.6% of the wisdom variance alongside other variables, explaining an additional 0.4% of the variance by itself.

Table 3

One-Way Analysis of Variance (ANOVA) for Assessing the Significance of the Contribution of Variables Entered in the Regression Equation in Predicting Wisdom

Variable	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance
Initiation	Regression	2579.17	1	2579.17	276.98
	Residual	3212.48	345	9.31	
	Total	5791.65	346		
Organization	Regression	3483.28	2	1741.64	259.54
	Residual	2308.37	344	6.71	
	Total	5791.65	346		
Monitoring	Regression	3930.82	3	1310.27	241.51
	Residual	1860.83	343	5.24	
	Total	5791.65	346		
Secure Attachment to Mother	Regression	4164.50	4	1041.12	218.12
	Residual	1627.14	342	5.24	
	Total	5791.64	346		
Secure Attachment to Father	Regression	4312.25	5	862.45	198.75
	Residual	1479.40	341	4.33	
	Total	5791.65	346		
Inhibition	Regression	4386.95	6	731.16	176.97
	Residual	1404.70	340	4.13	
	Total	5791.65	346		
Emotional Control	Regression	4414.94	7	630.70	155.30
	Residual	1376.71	339	4.06	
	Total	5791.65	346		
Insecure Attachment to Mother	Regression	4437.46	8	554.68	138.44
	Residual	1354.19	338	4.006	
	Total	5791.65	346		

As observed in Table 3, the contribution predicted at each step is statistically significant and reliable ($p < 0.001$).

Table 4

Raw and Standardized Regression Coefficients for Predicting Wisdom Based on Predictor Variables

Variable	Raw Coefficient (B)	Standard Error	Standardized Coefficient (Beta)	T	Significance
Constant	64.94	1.56	-	41.50	<0.001
Organization	0.108	0.019	0.197	5.56	<0.001
Monitoring	0.217	0.031	0.226	6.97	<0.001
Secure Attachment to Mother	0.143	0.021	0.213	6.74	<0.001
Secure Attachment to Father	0.126	0.027	0.154	4.62	<0.001
Inhibition	0.031	0.006	0.167	4.78	<0.001
Emotional Control	0.086	0.022	0.123	3.87	<0.001
Organization (additional)	0.063	0.023	0.090	2.77	0.006
Insecure Attachment to Mother	-0.031	0.013	-0.079	-2.37	0.018

As illustrated in Table 4, the raw and standardized regression coefficients for predicting wisdom based on variables such as initiation, organization, monitoring, secure attachment to parents, inhibition, and emotional control are provided and statistically significant.

4. Discussion and Conclusion

The results of the Pearson correlation indicated that all dimensions of executive function have a positive and significant relationship with wisdom. Among personality traits, all except extraversion have a positive and significant relationship with wisdom. All dimensions of attachment also have a significant relationship with wisdom, with secure

attachment to parents being positively significant and insecure attachment to parents negatively significant.

The outcome of this analysis showed that all predictor variables, except extraversion, have a positive and significant relationship with wisdom. Among these variables, neuroticism, and insecure attachment with both parents have a negative and significant relationship with wisdom, while the remaining variables show a positive and significant relationship. Stepwise regression results demonstrated that among the examined variables, individual executive performance and secure attachment with the mother have predictive power for wisdom. Until now, no research has been conducted on predicting wisdom based on these variables; however, various studies have shown that there is a positive and significant relationship between positive psychological constructs and wisdom, and a negative and significant relationship between negative constructs and wisdom. Thus, the results of this study are consistent with other findings (Barzegar et al., 2021; Ghorbani & Khormaei, 2016; Ghorbani & Khormaei, 2018; Mojoodi et al., 2018; Saadati et al., 2020; Yousefi et al., 2011; Zabihi Hesari et al., 2017).

In explaining the significant positive relationship between the dimensions of executive function and wisdom, it can be said that since executive function refers to cognitive processes employed in the management of goal-directed behavior, including a set of higher abilities such as self-regulation, self-initiation, planning, working memory, organization, sense and perception of time, future prediction, and problem-solving, these functions help individuals control their thinking consciously using mental processing daily and learning tasks. Executive functions regulate behavioral outputs and typically involve inhibition and stimulus control, working memory, cognitive flexibility, planning, and organization. Factor analysis has shown four factors of executive functions: response inhibition, working memory, self-regulation, and interference control (Javanbakht & Yousefi, 2022). Generally, most researchers have accepted that executive functions are self-regulatory functions that demonstrate an individual's ability to inhibit, self-modify, plan, organize, use working memory, solve problems, and set goals for task completion. Thus, such a person is expected to demonstrate a combination of psychological orientations and traits considered ideal for individual and social well-being, providing a foundation for thinking and experience in the form of emotional, cognitive, and profound indices or wisdom (Baggetta & Alexander, 2016). On the other hand, the emotional index of wisdom

indicates the presence of positive emotions (including empathy and compassion) and the absence of negative emotions and behaviors towards others. The cognitive index of wisdom includes the ability and inclination to understand life and pay attention to its deeper meanings, especially with regard to intrapersonal and interpersonal topics. The profundity index of wisdom pertains to considering life events from various perspectives to gain insight into the nature of phenomena. Profundity develops self-awareness and concurrently enhances cognition and emotions (Mehraban et al., 2023). Therefore, it is expected that an individual with higher executive function would naturally possess higher wisdom (Doebel, 2020).

In explaining the significant negative relationship between neuroticism and wisdom, it can be said that since a neurotic individual suffers from sorrow, high irritation, worry, fear, anxiety about the future, inability to solve problems, rumination, weakness in cognitive abilities, feelings of shame and guilt, vulnerability to stress, and inability to make correct decisions (Poure et al., 2023), such an individual is expected to be incapable in the realm of wisdom that requires the ability to understand life and its governing meanings; also, due to negative internal experiences, they cannot establish effective and functional relationships with others and consequently are incapable of displaying positive emotions such as compassion and empathy towards their peers. Thus, it is expected that high neuroticism would be associated with low wisdom.

In explaining the significant positive relationship between openness to experience and wisdom, it can be said that since openness to experience signifies having a spirit of discovering existence and the surrounding world, and open individuals are inclined to understand the universe and acquire a more comprehensive knowledge of life, enjoying a deep and aesthetically pleasing view of life, and possess profound thinking power, it is expected that such an individual could potentially enhance their wisdom through everyday experiences, especially if they can create a synthesis of gathered information and use it properly to enhance their own well-being and that of others. In the social structure, wisdom allows everyone to listen to others, assess what they say, and then make intelligent suggestions. Thus, an individual who is open to experience can increase their wisdom provided they have developed these conditions (Ghorbani & Khormaei, 2016).

In explaining the significant positive relationship between agreeableness and wisdom, it can be said that since agreeableness is a set of traits indicating that an individual

can trust those around them, is authentic, does not have a complex and intricate personality, does not feel superior to others, understands others, and has good compassion and empathy, it seems that if these states are not extreme, such an individual would have higher wisdom, because according to Ardel (2003), a wise person has the ability to attend to the common good (Ardelt, 2003).

In explaining the positive relationship between conscientiousness and wisdom, it can be said that since in wisdom, an individual has the ability to organize life, suffers from unfinished tasks, has the ability to complete tasks they start; believes in their abilities and deems themselves worthy in performing tasks, also possesses good perseverance and continues tasks until they are completed; is conscientious and able to complete tasks and responsibilities assigned to them in the best possible way, is responsible and does not shirk their responsibilities, thus it is expected that such an individual would have a suitable position in cognitive, emotional, and behavioral indices of wisdom.

In explaining the significant positive relationship between wisdom and secure attachment style to mother and father, it can be said that since secure attachment style to mother indicates that the student has a suitable relationship with their mother, is close to her, does not feel anxiety in her presence, enjoys life with her, perceives trust and companionship from their relationship with her, perceives her support, and feels secure in her presence, it seems that this sense of security overall leads to a reduction in relational anxiety in the individual and provides a ground for cognitive, reflective, and emotional growth in the individual, and consequently helps in the development of wisdom (Mojoodi et al., 2018).

Finally, in explaining the negative relationship between insecure attachment style to father and mother and wisdom, it can be said that since in this type of attachment style to father and mother, the individual is anxious in their most important relationship and cannot trust the closest people in their life, does not hope for support from them, and worries about being harmed by them (Karimzadeh Navadian, 2023), therefore, it is expected that such an individual, due to feeling insecurity in relationships, always experiences anxieties and worries that hinder the growth of wisdom in cognitive, reflective, and emotional dimensions (Mojoodi et al., 2018).

5. Limitations & Suggestions

This research, like other studies, had limitations, including the non-random selection of subjects, and it is recommended to other researchers interested in this field to consider random selection. Also, advisors in the field of youth are advised to pay attention to improving executive performance to enhance wisdom. It is worth noting that in the packages for correcting parenting styles and considering the importance of the role of secure attachment style in the development of wisdom, it is necessary to pay attention to how a secure attachment style will affect the wise or unwise outlook on life.

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Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors contributed equally.

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