Proceeding Paper

Cyberaggression, Personality and Genetics †

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†   Presented at the 6th International Congress of CiiEM—Immediate and Future Challenges to Foster One
    Health, Almada, Portugal, 5–7 July 2023.

Abstract: Cyber aggression can be defined as a form of aggression where the perpetrator uses digital media to harm a person or group of people. The literature has linked aggression to personality and genetics. This study aimed to show the relationship between cyber aggression and personality and polymorphisms associated with aggression-related serotonergic and dopaminergic processes. The sample consisted of 93 individuals, 81 women (87.1%) and 12 males (12.9%) with a mean age of 20.95 (SD = 2.98), and it was collected as part of the research project "Aggressiveness and Genetics in a University Context". The most important results indicate that cyber aggression and aggression are related to personality traits, especially agreeableness. An influence of genetic variables was not found.

Keywords: aggression; cyber aggression; personality; genetics; serotonin; dopamine

1. Introduction

Human aggression can be defined as any behaviour performed by an individual with intention to cause harm to another person or group of people. The perpetrator must believe that the behaviour will cause harm to the victim and the victim must be motivated to avoid that harm [1].

With the expansion of communication technologies in recent years and their integration into everyday life, new benefits and problems have emerged, including a new form of aggression, cyber aggression, amplified by internet communication [2,3]. This includes defamation, social exclusion, swearing and comments that indirectly apply to an individual [2,4]. Some forms of cyber aggression are similar to verbal aggression, involving hostile words and insults to cause psychological harm to the victim [3,5].

Several variables are used to study aggression, and therefore cyber aggression, and one of these variables is personality. Personality traits such as agreeableness, neuroticism [6] and conscientiousness [7] are usually studied to understand their relationship with aggression, and studies have shown a relationship between personality traits and aggression. Looking at these personality dimensions and their relationship with aggression, the agreeableness trait is the one that is most negatively associated with aggression, i.e., people with higher scores on this personality dimension show less aggressive behaviour [6], as is conscientiousness, which also tends to be negatively associated with aggression [7]. On the other hand, neuroticism is positively associated with aggressive behaviour. Openness to experience is not associated with aggression [6], and extroversion has had mixed results, with studies finding negative relationships between extroversion and physical aggression [7] and other studies finding a positive relationship between the two [8].

Personality and aggression are also linked to some genetic markers. Some studies on this issue have found a relationship between the serotoninergic and dopaminergic systems

and aggression. These genetic markers impact the manifestation of hostile behaviour, anger and other antecedents of aggressive behaviour [9–11] and personality, thus influencing human behaviour [12]. According to some studies on the General Model of Aggression, one of the models that tries to explain aggression, it has been possible to verify a link between aggression and serotonin [13].

This paper aimed to show the relationship between cyber aggression and personality traits and some polymorphisms related to serotoninergic and dopaminergic processes.

2. Materials and Methods

The sample consists of 93 individuals, including 81 females (87.1%) and 12 males (12.9%), aged between 17 and 40 years, with a mean age of 20.95 (SD = 2.98). First, genetic material was collected to find two polymorphisms related to serotonin and dopamine. The collection was performed by collecting DNA from mouth cells obtained from swabs. The volunteers extracted their own mouth cells, which were properly stored for later use in the Laboratory of Molecular Pathology and Forensic Biochemistry. Participants completed an online battery of psychological instruments: (1) the short version of the Buss-Perry Aggression Questionnaire (BPAQ-SF) [14], which assesses four forms of aggression (Physical and Verbal Aggression, Anger and Hostility); (2) the Reactive-Proactive Aggression Questionnaire (RPQ) [15], which assesses reactive and proactive aggression; (3) the Cyber-Aggression Typology Questionnaire (CATQ) [16], which assesses the different dimensions of cyber, impulsive-appetitive, impulsive-aversive, controlled-appetitive and controlled-aversive aggression; (4) and the NEO Five-Factor Inventory-3 (NEO-FFI-3) [17], which assesses the five dimensions of personality (Openness, Conscientiousness, Extroversion, Agreeableness and Neuroticism).

The present research is integrated in the scope of the project "Aggressiveness and Genetics in a University Context" which was previously approved in the IUEM's ethics committee. All of the participants signed an informed consent form, and their data were coded to ensure the privacy and confidentiality of each individual participant.

3. Results and Discussion

Concerning the cyber aggression behaviours, weak to moderate, positive, statistically significant correlations were found between the cyber aggression subscales and the other forms and functions of aggression. The results presented in Table 1 indicate that the agreeableness dimension showed significant and negative correlations with all the subscales that define cyber aggression, noting that participants with higher scores in agreeableness showed lower scores in all the subscales that assess cyber aggression. Another study [18] supports this finding by showing that agreeableness is negatively correlated with the perpetration of cyber aggression. No significant correlations were found between the other personality dimensions and cyber aggression.

Table 1. Relationship between cyber aggression and personality.

	Neuroticism	Conscientiousness	Extraversion	Agreeableness	Openness
Impulsive-Aversive	0.09	−0.09	0.06	−0.35 **	−0.09
Controlled-Aversive	−0.00	0.00	0.08	−0.32 **	−0.09
Controlled-Appetitive	0.03	−0.05	0.03	−0.27 **	−0.02
Impulsive-Appetitive	−0.02	−0.05	0.05	−0.37 **	0.02
Total	0.06	−0.07	0.06	−0.37 **	−0.07

** $p < 0.05$.

Regarding the dopaminergic and serotoninergic processes related to cyber aggression, the results showed no significant differences between the two genetic polymorphisms in relation to cyber aggression. Concerning the dopaminergic and serotoninergic processes involved in personality, the results showed no significant differences between the categories defining the two genetic polymorphisms and personality. According to studies on the Gen-

eral Model of Aggression, it has been possible to verify relationships between personality and aggression, especially with the serotonin polymorphism, which was not verified in this study [13].

4. Conclusions

In summary, this study presented significant results concerning the relationship between cyber aggression and personality. The study between cyber aggression and genetics did not show any significant results, even though the literature found relationships between the two variables, which may be related to this study's limitations. These are related to the sample, which is small and presents a much lower number of men than women, which may have significantly influenced the results obtained. This is important because studies have reported higher aggression scores in men than women [19,20]. It is therefore essential to have a large and more representative sample of the university population. With this study, we tried to find and confirm information about cyber aggression, personality and genetics that can contribute to the prevention of and intervention in cases of cyber aggression.

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