



ORIGINAL ARTICLE

Moderating effect of gender and MAOA genotype on aggression and violence



G. Castillo-López^a, F. Ostrosky-Shejet^{b,*}, B. Camarena-Medellín^c, A.E. Vélez-García^a

^a Laboratorio de Neuropsicología y Psicofisiología, Facultad de Psicología, Universidad Nacional Autónoma de México (UNAM), México, D.F., Mexico

^b Directora del Laboratorio de Neuropsicología y Psicofisiología, Facultad de Psicología, Universidad Nacional Autónoma de México (UNAM), México, D.F., Mexico

^c Instituto Nacional de Psiquiatría, Ramón de la Fuente Muñiz, México, D.F., Mexico

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Abstract

Introduction: Biological sex contributes to aggression, but there are other factors, like gender and genes, which have also proven to contribute to this behavior. Gender is defined as the stereotyped characteristics of each sex, but currently four gender identities have been stated: androgynous, instrumental, expressive and undifferentiated. MAOA gene has been more often related to aggression, particularly the low variant (MAOAL) of the MAOA-uVNTR polymorphism. **Objective:** This study investigated whether there was an interaction between gender and MAOA genotype on aggression.

Method: 292 healthy undergraduates were assessed using an aggression questionnaire (AQ) and an inventory of gender traits (EDAIE). The genotyping technique was employed to obtain the students' MAOA genotype. Main and interaction effects split by sex were analyzed by two-way MANOVAs.

Results: Androgynous traits had an effect on verbal aggression, anger, hostility and total aggression in males and females; while instrumental traits had an effect on physical aggression in males. MAOAH genotype had an effect on hostility in males; and MAOALH genotype on verbal aggression in females. Finally, a gender by MAOA-uVNTR interaction was observed on anger and total aggression in males.

Conclusions: Males are more likely to show anger and aggression when the predisposing genetic and environmental factors interact. Androgynous identity seems to lead to general aggression in both sexes; while instrumental identity to physical aggression just in males. On the other

* Corresponding author at: Facultad de Psicología, Universidad Nacional Autónoma de México, Av. Universidad # 3004, Col. Copilco-Universidad, Del. Coyoacán, C.P. 04510 México, D.F., Mexico. Tel.: +52 55 5622 2327; fax: +52 5 525176 56.

E-mail address: feggyostrosky@gmail.com (F. Ostrosky-Shejet).

PALABRAS CLAVE

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hand, undifferentiated identity apparently leads to less aggression. These findings shed light on factors that could be initial indicators for future violent behavior.

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Efecto moderador del género y el genotipo MAOA sobre la agresión y la violencia**Resumen**

Introducción: El sexo biológico contribuye a la agresión, pero existen otros factores, como el género y los genes, que también contribuyen a la misma. El género corresponde a las características estereotípicas de cada sexo, pero recientemente se han propuesto cuatro tipos: andrógino, instrumental, expresivo e indiferenciado. El gen de la MAOA es el que más se ha asociado a la agresión, particularmente la variante de baja actividad (MAOAL) del polimorfismo MAOA-uVNTR.

Objetivo: Investigar si existía una interacción entre el género y el genotipo MAOA sobre la agresión.

Método: Se evaluaron 292 universitarios sanos mediante un cuestionario de agresión (AQ) y un inventario de rasgos de género (EDAIE). Se usó la técnica de genotipificación para obtener el genotipo MAOA de los participantes y se analizaron los efectos principales y de interacción para cada sexo, mediante MANOVAs factoriales.

Resultados: Se observó un efecto de los rasgos andróginos sobre la agresión verbal, el enojo, la hostilidad y el total de agresión en hombres y mujeres; y de los rasgos instrumentales sobre la agresión física en hombres. Se identificó un efecto del genotipo MAOAH sobre la hostilidad en hombres; y del genotipo MAOALH sobre la agresión verbal en mujeres. También se apreció un efecto de la interacción entre el género y el genotipo MAOA sobre el total de agresión y el enojo en hombres.

Conclusiones: Los hombres parecen ser más susceptibles al enojo y a la agresión cuando hay una interacción de factores genéticos y ambientales predisponentes. Los rasgos andróginos parecen predisponer a la agresión en ambos sexos; y los rasgos instrumentales sólo a la agresión física en hombres. En cambio, los rasgos indiferenciados aparentemente conducen a menor agresión. Tales hallazgos apuntan hacia factores que podrían ser indicadores de un comportamiento violento posterior.

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Introduction**Aggression and violence**

Aggression is a multifactorial phenomenon that could be specified as an adaptive, natural behavior regulated by reinforcements, whose immediate goal is to provoke physical or psychological damage to another individual or object, in order to survive and maintain the species.¹⁻¹¹ Anger and hostility may predispose to aggression,¹²⁻¹⁶ as they have been claimed to be its emotional and cognitive components, respectively.³ Regarding its expression, two different types of aggression have been proposed: direct and indirect one.⁸ The first one includes physical and verbal aggression; while the second one refers to aggression by social means.¹⁷

When it is extreme, destructive, unjustified and not socially approved, aggression has been better considered as violence, which is more commonly related to human beings than animals.^{2,18} This behavior has always been present in

the human history and is currently increasing as a rising problem of mortality in Latin America¹⁰ and insecurity in Mexico.¹⁹

Gender and aggression

Biological sex contributes significantly to aggression, being males more generally aggressive than females, particularly in a physical manner.^{16,20-24} However, there are other factors that also contribute to explain aggression, such as gender, which is the identity men and women have shaped through what their society has set as typical for each sex: masculinity and femininity. Hence, people are supposed to behave according to their internalized gender. Masculinity highlights acting, strength, control, independence, selfishness and domain; while femininity is more related to emotions, nursing, tenderness, passivity and obedience.²⁵⁻²⁷ However, as typical traits could coexist in the same person, regardless its biological sex, four gender identities have

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