

COOPERATIVITY, SELF-TRANSCENDENCE AND SELF-DIRECTION IN MEN AND WOMEN WHO PRACTICE CONTACT SPORTS

COOPERATIVIDAD, AUTOTRASCENDENCIA, AUTODIRECCIÓN EN HOMBRES Y MUJERES QUE PRACTICAN DEPORTES DE CONTACTO

Karla Rebeca Gil Alvarado. krebecagil01@hotmail.com. National Autonomous University of Mexico. ORCID: <https://orcid.org/0009-0003-3907-0153>

Gabriela Orozco Calderón. gabrielaorocal@gmail.com. National Autonomous University of Mexico. ORCID: <https://orcid.org/0000-0002-4978-1667>

Olivia Ramos Mohedano. olirm94@hotmail.com. National Autonomous University of Mexico. ORCID: <https://orcid.org/0009-0009-9195-7070>

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ABSTRACT

The constant practice of a sport influences the personality, molding it, modifying it and enhancing its traits. Differences in personality have been described according to the gender of birth of individuals. Character is defined as the self-concept and individual differences in goals and values guiding the individual's life experiences and are influenced by sociocultural learning. In this trait, social environment and the zone in which one lives influence the individual's development and the way to interact in sports as a function of their gender. The purpose of this research is describing and comparing personality and character dimensions of male and female practicing contact sports, as well as sedentary people of both sexes. One hundred two people participated in the study. Each participant was individually assessed with the Temperament and Character Inventory. The results suggest that athletes scored higher in self-direction. In cooperativity, athletes and men in the controlling group, scored higher than women did. In self-transcendence, female athletes outperformed the control groups. In addition, differences were found in character sub dimensions between

the groups. In conclusion, gender is an important variable to take into account in the character trait.

KEYWORDS: Gender; sport; cooperativity; self-transcendence; self-direction

RESUMEN

La práctica constante de un deporte influye en la personalidad moldeando, modificando y potenciando los rasgos que la constituyen. Han sido descritas diferencias en personalidad dependiendo del género de nacimiento de las personas. El carácter se define como el autoconcepto y diferencias individuales en metas y valores que guían las experiencias de vida del individuo influenciadas por el aprendizaje sociocultural. En este rasgo, el ambiente social y el medio en el que se vive influyen en cómo se van desarrollando los individuos y como interactúa en los deportes en función de su género. El objetivo fue describir y comparar las dimensiones de la personalidad carácter en hombres y mujeres deportistas de contacto y personas sedentarias de ambos sexos. Participaron 122 personas. Fueron evaluados individualmente con el Inventario de Temperamento y Carácter. Los hallazgos indican que los grupos deportistas puntuaron más alto en autodirección. En cooperatividad los deportistas y el grupo de hombres control que puntuaron más alto comparado con mujeres control. En autotranscendencia las mujeres deportistas superaron a los grupos control. Además, fueron encontradas diferencias en las subdimensiones de carácter entre los grupos. Se concluye que el género es una variable importante para tomar en cuenta en el rasgo de carácter en la personalidad de los deportistas.

PALABRAS CLAVE: género; deporte; cooperatividad; autotranscendencia; autodirección

INTRODUCTION

To understand the psychological factors involved in sports and their effects on behavior, it is important to study personality from a psychobiological perspective, which includes not only inherited aspects but also the importance of environmental factors understood as social and/or learned aspects. The term personality is often

used to describe people; however, its definition is varied. Its etymology derives from the Latin *person*, which refers to the mask used by actors in a play (Montaño et al., 2009).

From personality psychobiological theories, behavior focuses on two main traits: temperament and character. Cloninger is one of the main authors who proposes the Temperament and Character Inventory (Montaño et al., 2009; Coon, 2005 & Cloninger, Svrakic, & Przybeck, 1993). It is considered that individual differences in personality are explained by biological mechanisms, which account for cognitive processes. Furthermore, these models are not only descriptive but also explanatory, pragmatic, and causal, linked to applied psychology (Dolcet, 2006).

For Cloninger, personality is defined as «the dynamic organization of the psychobiological systems that modulate adaptation to experience»; these different adaptive systems make each individual different (Cloninger, Svrakic, & Przybeck, 1993). Developing personality is understood from the interaction between the subject's genetics (inheritance) related to temperament and the influence of the environment understood as character, which are formed from childhood until they become stable structures in adulthood (Allen, Greenless, & Jones, 2013), and has differences according to age and gender (Pelegrin & Garcés, 2008; Pelka-Wysiecka, et al., 2012 & Gaytán, 2009).

Thus, it is explained that there is a biological component originating at the brain level, which interacts with various social and environmental factors that influence behavior (Cloninger, Svrakic, & Przybeck, 1993).

Cloninger proposes three-character dimensions: Self-direction, Cooperativity, and Self-transcendence, thus giving rise to the current model named Cloninger's Temperament and Character Questionnaire (Cloninger, 1993; Dolcet, 2006).

Self-direction refers to self-determination, self-esteem, and the individual's ability to control, regulate, and adapt his behavior according to personal values and goals (Minaya, Fresán, & Loyzaga, 2009).

It has been described to correlate with brain areas called the previous cingulate cortex, back of the cingulate cortex, and medial prefrontal cortex (Van et al., 2011; Tuominen, et al., 2013) and it has been linked to ADOR_{2A} (adenosine A_{2A} receptor) (Comings, et al., 2000).

The other dimension, called *cooperativity*, is the ability to accept and identify with other people. It has also been related to brain areas, such as the motor and premotor cortex, partially with the medial prefrontal cortex, the medial temporal gyrus, the previous insular cortex, and the hippocampus (Van et al., 2011 & Tuominen et al., 2013), as well as with ADRA_{2B} (adrenergic alpha-2B receptor, involved in the release of neurotransmitters from adrenergic neurons) and a relationship with the genes DAT₁ (dopamine transporter, its function is to transport the dopaminergic neurotransmitter), phenylethanolamine N-methyltransferase, an enzyme that converts norepinephrine to epinephrine (PNMT), GABRA₆ (Gamma-aminobutyric acid type A receptor alpha-6 subunit, it is the main inhibitory neurotransmitter of Gaba-A receptors), NMDAR₁ (N-methyl-D-apparatus, related to glutamate receptor channels), CYP₁₉ (aromatase) and OXYR (oxidative and nitrosative stress) (Comings, et al., 2000).

Finally, *self-transcendence* refers to spiritual maturity, transpersonal identification, and creativity. It has been related to the temporal and frontal cortex (Van et al., 2011), and also, it linked to the serotonin receptor 5HT₂ and the serotonin transporter (Calati, et al., 2014 & Kim, et al., 2015) and a relationship with DRD₄ (dopamine D4 receptor, encodes the D4 subtype of the dopamine receptor) and GABRA₁ (Gamma-aminobutyric acid type A receptor alpha-1 subunit) (Comings, et al., 2000).

These dimensions are subdivided into general subdimensions; there are thirteen subdimensions (See Table 1) to assess character, (González-Santos et al., 2007; Dolcet, 2006; Kose, 2003; Cloninger, Svrakic, & Przybeck, 1993; Sánchez de Carmona et al., 1996).

Dimensions	Subdimensions
Character	
<i>Self-direction</i> (SD 40 items)	SD1: responsibility vs. culpability SD2: determination vs undirected SD3: resourcefulness vs apathy SD4: self-acceptance vs self-striving SD5: congruence with ideals
<i>Cooperativity</i> (C 42 items)	C1: social acceptance vs intolerance C2: empathy vs social disinterest C3 helpfulness vs incapability C4: compassion vs revenge C5: integrity vs lack of scruples
<i>Self-transcendence</i> (ST 33 items)	ST1: creative concentration vs awareness ST2: transpersonal identification ST3: social acceptance vs materialism

Table 1. Dimensions and subdimensions of character

Note: Items, dimensions, and subdimensions are taken from the standardization to Mexican population by Sánchez de Carmona et al. (1996) and from the Serbian adaptation by Dzamonja-Ignjatovic et al. (2010).

Gender is an important variable when discussing personality. Some studies have linked psychiatric alterations to gender differences, as it has been found that women with antisocial personality disorder present fewer episodes of antisocial behavior than men (Sher, et al., 2015).

Similarly, it has been found in people without psychiatric illness that men have lower scores in cooperativity (Richter, Polak, & Eisemann, 2003), which contrasts with women who have high cooperativity, as well as higher scores in self-transcendence compared to men. Personality differences between genders have even been studied in patients with diseases such as heart disease, where men worry about their health, have a greater depression and anger regarding their illness, while women show a greater need to make a favorable impression and offer socially accepted responses, feel more dissatisfied, moody, and have fewer

defenses to face their situation (Ríos Martínez, Huitrón Cervantes, & Rangel Rodríguez, 2009).

A sport constant practice also influences personality by shaping and modifying its traits, enhancing them, such as leadership, dominance, personal security, confidence, emotional maturity, and social balance.

In the case of character, the social environment and the zone in which one lives influence the individual's development. In team sports, higher scores have been found in self-actualization, humanitarian spirit, irritability, and aggressiveness. While individual sports show higher scores in emotionality (Bara Filho, Ribeiro, & García, 2004).

In athletes who practice combat sports, which are mainly individual sports (Ruiz, 2012; Orozco-Calderón, 2015; Ruz-Santos & Orozco-Calderón, 2019), it has been found that men and women are more emotionally stable, with greater open-mindedness, dynamism, perseverance, and greater impulse control; thus, they are greater openness to culture and experience compared to non-athletes.

Regarding cooperativity character trait, women score higher than men, which means that they are more empathetic, kind, pleasant, helpful, compassionate, and tolerant.

On the other hand, regarding character male and female martial athletes got higher scores in self-transcendence subdimensions; mainly in subscales SD2, SD3, SD4 and SD5, cooperativity; mainly in CO1, CO2, CO3, CO4 and CO5 and self-direction; mainly in ST1, compared to non-practicing men and women (Orozco Calderón, 2015). Therefore, this research is carried out to describe and compare personality, temperament, and character dimensions in men and women practicing contact sports and compare them, as well as sedentary people of both sexes.

MATERIALS AND METHODS

It is a non-experimental, cross-sectional, descriptive, and comparative study design (Kerlinger, 2002). The sample is composed by 122 participants divided into four groups; the male athlete group (MA) (n=36) was about 23 and 47 years old and a standard deviation of 3,62 years old, with a practicing time frequency for 1,5 months to 288 (68,68/62,51) and an average of 7,97/5,25 practicing hours per week. Meanwhile, the female athlete group (FA) (n=25) was about 27,68 and a standard deviation of 8,10, with a practicing time frequency from 1 to 324 months and hours practiced per week from 2 to 15 hours.

The two control groups were men and women who did not practice any sport; men (MC) (n=36) were about 21,25 years old and a standard deviation of 3,91 and, in the case of sedentary women (FS) (n=25) they were about 23,72 years old and a standard deviation of 5,55 (Table 2).

Gender	n	Age	Practicing time (months)	Hours per week
Male athletes (MA)	3	18-31	1,5-288 (68,68/62,51)	1-25 (7,97/5,25)
	6	(23,47/3,62)		
Female athletes (FA)	2	18-52	1-324 (54,16/79,37)	2-15 (5,88/3,61)
	5	(27,68/8,10)		
Male control (MC)	3	17-34	0	0
	6	(21,25/3,91)		
Female control (FC)	2	18-39	0	0
	5	(23,72/5,55)		

Table 2. Sociodemographic data of the groups.

Instrument. The Temperament and Character Inventory (TCI) created by Cloninger was used, which was translated, standardized, and validated in the Mexican population by Sánchez de Carmona et al. (1996). It has 240 dichotomous response items (true and false), which requires the participant to understand each item and answer honestly according to what best reflects their self-experience.

The ITC evaluates personality in three-character dimensions, understood as self-concepts and individual differences in goals and values that guide choices and influence the meaning the individual gives to experiences (Sánchez de Carmona et al., 1996).

The three character dimensions are: Self-direction (SD), subdivided into SD1 responsibility vs. culpability, SD2 determination vs. undirected, SD3 resourcefulness vs. apathy, SD4 self-acceptance vs. self-striving, and SD5 congruence with ideals; cooperativity (C), subdivided into C1 social acceptance vs. intolerance, C2 empathy vs. social disinterest, C3 helpfulness vs. incapability, C4 compassion vs. revenge, and C5 integrity vs. lack of scruples; and Self-Transcendence (ST), subdivided into ST1 creative concentration vs. awareness, ST2 transpersonal identification, and ST3 social acceptance vs. materialism (Sánchez de Carmona et al., 1996).

Procedure. Participants were recruited by means of flyers and online advertisements requesting voluntary participation. Once contacted, a semi-structured interview was initially conducted with the athletes to obtain sociodemographic data, sport practiced, duration of practice, among other details. They were individually asked to read and, if they agreed, sign the informed consent form after a detailed explanation about the study and the personal information confidentiality and results.

Inclusion criteria were: practicing a contact sport (e.g., boxing, judo, taekwondo, kickboxing, kendo, mixed martial arts, American football, full contact, and Rugby) continuously; having a minimum of practicing five months; being of legal age; signing the informed consent. Exclusion criteria were: having a neurological or psychiatric illness history; having uncorrected vision or hearing problems.

Data Analysis. It was used the statistical package SPSS (*Statistical Package for the Social Sciences*) version 20 for the database analysis. Descriptive statistics were performed to observe the data distribution, thus determining the use of the non-parametric Kruskal-Wallis (H) test for statistical analysis, with a Post hoc Mann-

Whitney U (U) test for independent samples, to compare personality dimensions between male and female contact sport athletes and sedentary groups (Guardia Olmos, Freixa Blanxart, Però Cebollero, & Turbany Oset, 2007; Kerlinger, 2002; Rivera Aragón & García Méndez, 2012).

RESULTS AND DISCUSSION

In the general character dimensions, the statistical analysis showed significant differences in the TCI dimensions for character in SD ($K=42,02$; $p=0,00$), C ($K=20,00$; $p=0,00$), ST ($K=8,54$; $p=0.036$) and P ($K=24,79$; $p=0,000$). In SD, differences were found in the female (28,88/7) and male (31,27/8,22) athlete groups, as they scored higher compared to the controlling groups (males: 21,94/5,98; females: 18,52/4,38).

In C, there were found differences in the athlete groups (Males: 30,47/6,04; Females: 29,08/7,10) and male in the controlling group (30.30/5.88), who scored higher compared to female in the controlling control group (23,48/4,85). In ST, there were found differences in female athlete group (18,84/6,31), which scored higher compared to the controlling groups (males: 14,75/6,09; females: 14,40/4,33). *It was done with the post hoc Mann-Whitney U test, $p \leq 0.05$.*

There were found differences in the results of the character subdimension analyses, SD1 ($K=40,33$; $p=0,000$), SD2 ($K=17,95$; $p=0,000$), SD3 ($K=41,26$; $p=0,000$), SD4 ($K=11,90$; $p=0,008$), SD5 ($K=26,57$; $p=0,000$), C1 ($K=29,95$; $p=0,000$), C2 ($K=24,35$; $p=0,000$), C3 ($K=8,96$; $p=0,030$), C4 ($K=13,50$; $p=0,004$), C5 ($K=20,45$; $p=0,000$), and in ST1 ($K=7,96$; $p=0,047$).

In SD1, differences were found in the athlete groups who scored higher (males: 5,94/2,68; females: 5,20/2,54) compared to the controlling groups (males: 2,27/1,46; females: 2,36/1,80). In SD2, differences were found in male athlete group (6,05/1,63), which scored higher compared to the controlling groups, and female athlete group (6,00/1,58), which scored higher compared to the controlling groups (males: 4,88/1,36; females: 4,64/1,25).

In SD3, there were differences in the athlete groups (males: 3,52/1,42; females: 3,44/1,47), who scored higher compared to the controlling groups (males: 1,75/0,99; females: 1,48/0,82).

In SD4, differences were found in male athlete (6,44/2,71) and male controlling groups (6,13/2,38), who scored higher compared to female controlling group (4,32/2,01). In SD5, differences were in the athlete groups (males: 9,30/2,38; females: 8,60/2,36), as they scored higher compared to the controlling groups (males: 6,88/2,35; females: 6,44/2,10).

In C1, differences were in the athlete groups who scored higher (males: 6,05/1,94; females: 5,84/1,70) compared to the controlling groups (males: 4,05/0,98; females: 4,12/0,72). In C2, differences were found in male and female athlete groups (males: 4,77/1,35; females: 4,52/1,53), who scored higher compared to the controlling groups (males: 3,58/1,22; females: 3,20/0,86). In C3, differences were found in male athlete group (6,11/0,97), which scored higher compared to the controlling groups (males: 5,61/1,29; females: 5,16/1,40), and female athlete group (5,84/1,62), which scored higher compared to female controlling group (females: 5,16/1,40). In C4, differences were found in male athlete (7,19/2,75), female athlete (6,36/2,44), and male controlling groups (6,94/2,85), who scored higher compared to female controlling group (4,84/1,97).

Finally, in C5, differences were in the athlete groups (males: 6,33/1,35; females: 6,52/1,47), who scored higher compared to the controlling groups.

In ST1, differences were found in female athlete group (7,32/1,95), who scored higher relative to the controlling groups (males: 5,83/2,38; females: 5,92/2,37). In ST2, differences were found in male athlete group (4,50/2,48), which scored higher relative to female controlling group (3,28/1,81). In ST3, differences were found in female athlete group (7,28/3,47), which scored higher relative to male groups (male athletes: 6,30/3,48; male controls: 5,41/2,64).

In self-direction, the differences in the total score are: athletes scored higher than the controlling groups, indicating that athletes are responsible, their lives have meaning and purpose, they are capable of postponing immediate satisfaction for achieving a greater goal, and they have the initiative to overcome challenges. Also, within the controlling groups, women scored is lower than men's group, while women are insecure, lacking initiative, they feel lost or feel their lives lack meaning and purpose, and they are unable to postpone immediate gratification.

It is found the following in its subdimensions: in responsibility vs. culpability (SD1), the athlete groups scored higher compared to the controlling groups, suggesting that athletes have a high sense of responsibility. In determination vs. undirected (SD2), male athletes scored higher than the controlling groups, and female athletes scored higher compared to the controlling groups, suggesting that athlete groups have a life with meaning and purpose, which focuses their behavior on their goals. In resourcefulness vs. apathy (SD3), male and female athletes scored higher than the controlling groups, indicating that they feel the necessary confidence and have the tools needed to solve their problems, high self-esteem, and confidence to achieve their goals. In self-acceptance vs. self-striving (SD4), male athletes and male controlling scored higher than female controlling, suggesting that these groups show initiative and confidence to overcome challenges. In congruence vs. ideals (SD5), athlete groups scored higher compared to the controlling groups, suggesting they have the capacity to delay satisfaction to achieve their goals.

These findings agree with the literature where athletes also scored higher compared to controlling groups. This means that athletes are responsible, their lives have meaning and purpose, they are capable of postponing immediate satisfaction for achieving a greater goal, and they have the initiative to overcome challenges (Orozco, 2015; Cloninger, 1993; Minaya, Fresán, & Loyzaga, 2009).

Regarding gender differences, the results agree with studies indicating that men get higher scores compared to women (Castellanos Cano, Guerra Mora, & Bueno Alvarez, 2014), which suggests that men's personality is more purposeful in their

goals and resolution. Concerning cooperativity dimension, the differences in the total score are found in the athlete groups and male controlling group, who scored higher compared to female controlling group. This suggests that formers are more socially tolerant, empathic, kind, and helpful, which contrasts with findings from one study where men had lower scores than women (Richter, Polak, & Eisemann, 2003). Regarding cooperativity subdimensions, it was found the following: In social acceptance vs. intolerance (C1), the athlete groups scored higher compared to the controlling groups, suggesting that athletes have the capacity to identify with other people.

In empathy vs. social disinterest (C2), male and female athletes scored higher relative to the controlling groups, indicating that they feel sympathy to others and have the capacity to feel the same towards others.

In helpfulness vs. incapability (C3), male athlete group scored higher compared to the controlling groups, and female athlete group scored higher compared to female controlling group, suggesting that these groups are kind towards others. In compassion vs. revenge (C4), male athlete, female athlete, and male controlling groups scored higher compared to female controlling group, suggesting that these groups are generous towards others.

In integrity vs. lack of scruples (C5), athlete groups scored higher than the controlling groups, suggesting they are honest and loyal. These results agree with studies where athletes got higher scores in cooperativity. There are differences in athlete groups and the male controlling group scored higher compared to the female controlling group, meaning these groups are more socially tolerant, empathic, kind, and helpful (Orozco, 2015); however, regarding gender differences, this contrasts with findings from another study where women have higher scores compared to men (Richter, Polak, & Eisemann, 2003; Orozco Calderón & González Osornio, 2012; Miyajima, et al. 2014).

In self-transcendence, differences were found in the total score in athlete groups, who scored higher than the controlling groups, and within the controlling groups, male group scored higher than females. This suggests a creative consciousness and intrapersonal identification in these groups; that is, they are aware of their capabilities and limitations, they are able to realistically see their way of being and where they want to go, and also, they are connected with their spirituality. This aligns with findings from a study where women present high scores in this dimension compared to men (Richter, Polak, & Eisemann, 2003). Concerning self-transcendence subdimensions, it is found the following: in creative concentration vs. awareness (ST1), female athlete group scored higher compared to the controlling groups, suggesting that female athletes have a creative consciousness and are simultaneously aware of their own abilities and capacities.

The results agree with scientific background, where differences in the female athlete group, who scored higher relative to the controlling groups, suggest they have a creative consciousness; they identify intrapersonal, meaning they are aware of their capabilities and limitations, they know who they are and where they want to go, realistically and are connected with their spirituality. This agrees with other studies where women have high scores in this dimension compared to men (Richter, Polak, & Eisemann, 2003 & Miyajima, et al., 2014).

CONCLUSIONS

This study shows that there are significant differences in character dimensions between men and women groups: athletes and sedentary individuals. Specifically, athletes have high scores in self-transcendence, cooperativity, and self-direction, which suggests that practicing a sport helps to increase socially acceptable characteristics, such as empathy, helpfulness and reflectivity towards others or to decrease characteristics, such as impulsivity. Regarding differences based on birth gender, men got better scores in self-direction and cooperativity. Women have higher scores in self-transcendence. This means that gender is an important variable in personality study; however, scores were very similar within the athlete group while differences were more evident in the controlling groups. The results

in this study agrees with what has been previously found in literature, concerning differences between athletes and non-athletes, as well as gender differences, in addition to allowing us to provide information about the psychobiological personality in Mexican athletes.

BIBLIOGRAPHIC REFERENCES

- Allen, M. S., Greenless, I., & Jones, M. (2013). Personality in sport: A comprehensive review. *International Review of Sport and Exercise Psychology*, 6(1), 184-208.
<https://www.tandfonline.com/doi/abs/10.1080/1750984X.2013.769614>
- Bara Filho, M., Ribeiro, L. C., & García, F. G. (2004). La personalidad de deportistas brasileños de alto nivel: comparación entre diferentes modalidades deportivas. *Cuadernos de psicología del deporte*, 4.
<https://revistas.um.es/cpd/article/view/112491>
- Cloninger, C. R., Svrakic, D., & Przybeck, R. (1993). A Psychobiological Model of Temperament and Character. *Archives of General Psychiatry*, 50(12), 975-990.
<https://psycnet.apa.org/record/1994-13434-001>
- Cloninger, C. R., Zohar, A. H., Hirschmann, S., & Dahan, D. (2012). The psychological costs and benefits of being highly persistent: Personality profiles distinguish mood disorders from anxiety disorders. *Journal of affective disorders*, 136(3), 758-766. <https://pubmed.ncbi.nlm.nih.gov/22036800/>
- Cloninger, S. C. (2002). *Teorías de la personalidad*. Pearson Educación.
[https://books.google.com/books?hl=es&lr=&id=8O81kic5J5AC&oi=fnd&pg=PA1&dq=Cloninger,+S.+\(2003\).+Teor%C3%ADas+de+la+personalidad+\(3+ed.\)+M%C3%A9xico:+Pearson.&ots=21AFXGnGJn&sig=QRFgEySqLhzRcDfx1KEw5SLlqT4](https://books.google.com/books?hl=es&lr=&id=8O81kic5J5AC&oi=fnd&pg=PA1&dq=Cloninger,+S.+(2003).+Teor%C3%ADas+de+la+personalidad+(3+ed.)+M%C3%A9xico:+Pearson.&ots=21AFXGnGJn&sig=QRFgEySqLhzRcDfx1KEw5SLlqT4)

- Comings, D. E., Gade Andavolu, R., Gonzalez, N., Wu, S., Muhleman, D., Blake, H., . . . MacMurray, J. P. (2000). A multivariate analysis of 59 candidate genes in personality traits: the temperament and character inventory. *Clinical Genetics*, 58(5), 375-385. <https://pubmed.ncbi.nlm.nih.gov/11140838/>
- Coon, D. (2005). *Funamentos de psicología*. México: Cengage Learning Editores.
- Dolcet i Serra, J. (2006). *Carácter y temperamento: similitudes y diferencias entre los modelos de personalidad de 7 y 5 factores (el TCI-R versus el NEO-FFI-y el ZKPQ-50-CC)*. Universitat de Lleida. https://www.academia.edu/download/32479796/Estudio_modelo_Cloninger_i_Zuckerman.pdf
- Dzamonja-Ignjatovic, T., Svrakic, D. M., Svrakic, N., Jovanovic, M. D., & Cloninger, R. C. (2010). Cross-cultural validation of the revised Temperament and Character Inventory: Serbian data. *Comprehensive psychiatry*, 51(6), 649-655. <https://www.sciencedirect.com/science/article/pii/S0010440X09001424>
- González-Santos, L., Mercadillo, R., Graff, A., & Barrios, F. (2007). Versión computarizada para la aplicación del listado de síntomas 90 (SCL 90) y del Inventario de Temperamento y Carácter (ITC). *Salud Mental*, 30(4), 31-40. https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0185-33252007000400031
- Kerlinger, F. N. (2002). *Investigación del comportamiento*. México: McGRAW-HILL.
- Kim, J.-H., Son, Y.-D., Kim, J.-H., Choi, E.-J., Lee, S.-Y., Joo, Y.-H., . . . Cho, Z.-H. (2015). Self-transcendence Trait and Its Relationship with in vivo serotonin transporter Availability in Brainstem Raphe Nuclei: An Ultra-High Resolution PET-MRI Study. *Brain Research*. <https://www.semanticscholar.org/paper/Self-transcendence-trait-and-its-relationship-with-Kim-Son/357aa501c3bf3ec50cb49e9cfd0973e7d7ea5c56>

Kose, S. (2003). Psychobiological model of temperament and character: TCI. *Yeni Symposium*.

https://www.researchgate.net/publication/26390766_A_Psychobiological_Model_of_Temperament_and_Character_TCI

Minaya, O., Fresán, A., & Loyzaga, C. (2009). Dimensiones de temperamento y carácter en pacientes con primer episodio de depresión mayor. *Salud Mental*, 32, 309-315. <https://www.redalyc.org/pdf/582/58212276006.pdf>

Miyajima, E., Taira, N., Koda, M., & Kondo, T. (2014). Differences in personality traits between male-to-female and female-to-male gender identity disorder subjects. *Psychiatry research*, 220, 496-499. <https://pubmed.ncbi.nlm.nih.gov/25130781/>

Montaño Sinisterra, M., Palacios Cruz, J., & Gantiva, C. (2009). Teorías de la personalidad: Un análisis histórico del concepto y su medición. *Psychologia: Avances de la disciplina*, 3(2), 81-107. <https://www.redalyc.org/articulo.oa?id=297225531007>

Orozco Calderón, G. (2015). Cerebro y artes marciales: beneficios, riesgos e intervención neuropsicológica. *Ciencia & Futuro*, 5(4), 142-156. <https://revista.ismm.edu.cu/index.php/revistacyf/article/view/1201>

Orozco-Calderón, G. (2015). Temperamento y Carácter en practicantes mexicanos de Haidong Gumdo (Espada Coreana): Una perspectiva Psicobiológica de la Personalidad. *Acta de Investigación Psicológica*, 5(3), 2148-2161. <https://www.sciencedirect.com/science/article/pii/S2007471916300060>

Pelegrin, A., & Garcés de los Fayos, E. (2008). Evaluación teorica de un mmodelo explicativo de la agresion en el deporte. *EduPsykhé*, 7(1), 13-21. <https://dialnet.unirioja.es/servlet/articulo?codigo=2696646>

- Pelka-Wysiecka, J., Zietek, J., Grzywacz, A., Kucharska-Mazur, J., Bienkowski, P., & Samachowiec, J. (2012). Association of genetic polymorphisms with personality profile in individuals without psychiatric disorders. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, 30(30). <https://www.sciencedirect.com/science/article/abs/pii/S0278584612000814>
- Richter, J., Polak, T., & Eisemann, M. (2003). Depressive mood and personality in terms of temperament and character among the normal population and depressive inpatients. *Personality and individual differences*, 35, 917-927. <https://www.sciencedirect.com/science/article/abs/pii/S0191886902003082>
- Ríos Martínez, B., Huitrón Cervantes, G., & Rangel Rodríguez, G. (2009). Psicopatología y personalidad en pacientes cardíopatas. *Archivos de Cardiología de México*, 79(4), 257-262.
- Ruiz Barquín, R. (2012). Relaciones entre características de personalidad y estados de ánimo: un estudio con deportistas de combate universitarios. *Revista Iberoamericana de Psicología del ejercicio y el deporte*, 7(1), 89-112. <https://www.redalyc.org/articulo.oa?id=311126297006>
- Ruz-Santos, I.A. & Orozco-Calderón, G. (2019). Caracterización psicológica en deportistas de contacto con historial de conmoción cerebral. *Ciencia & Futuro*, 9(4), 94-114. <https://revista.ismm.edu.cu/index.php/revistacyf/article/view/1873>
- Sánchez de Carmona, M., Paez, F., López, J., & Nicolini, H. (1996). Traducción y confiabilidad del Inventario de Temperamento y Carácter (ITC). *Salud Mental*, 19, 5-9. <https://dialnet.unirioja.es/servlet/articulo?codigo=5794639>
- Sher, L., Siever, L. J., Goodman, M., McNamara, M., Hazlett, E. A., Koenigsberg, H. W., & New, A. S. (2015). Gender differences in the clinical characteristics and psychiatric comorbidity in patients with antisocial personality disorder. *Investigacion en Psiquiatría*, 229(3), 685-689. <https://www.sciencedirect.com/science/article/abs/pii/S0165178115301499>

Tuominen, L., Salo, J., Hirvonen, J., Nagren, K., Laine, P., Melartin, T., . . . Keltikangas Järvinen, L. (2013). Temperament, character and serotonin activity in the human brain: a positron emission tomography study based on a general population cohort. *Psychological Medicine*, 43, 881-894.

Van Schuerbeek, P., Baeken, C., De Raedt, R., De Mey, J., & Luyckaert, R. (2011). Individual differences in local gray and white matter volumes reflect differences in temperament and character: a voxel-based morphometry study in healthy young females. *Brain Research*, 1371, 32-42.
<https://www.sciencedirect.com/science/article/pii/S0006899310025862>