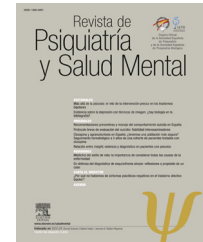




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## ORIGINAL ARTICLE

# Genetic and environmental influences on psychological traits and eating attitudes in a sample of Spanish schoolchildren<sup>☆</sup>

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### KEYWORDS

Eating disorders;  
Psychological traits;  
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### Abstract

**Introduction:** The heritability of eating disorders has been estimated to range from 22% to over 62%. The aim of this study is to determine the relative influence of genetics and environment that contribute to the drive for thinness, body dissatisfaction, perfectionism, and ineffectiveness, by evaluating sex differences in a sample of adolescent twins from Valencia, Spain.

**Material and methods:** Five hundred eighty-four pairs of adolescent twins between 13 and 18 years of age completed the study. To determine zygosity, teachers responded to a questionnaire on physical similarity. Psychological traits of eating disorders were assessed with four sub-scales of the Eating Disorder Inventory (EDI); drive for thinness, body dissatisfaction, perfectionism, and ineffectiveness. Twin models were used to assess genetic and environmental (common and unique) factors affecting these four psychological traits.

**Results:** All four traits showed significant genetic contributions among girls, with heritability estimates of 37.7% for ineffectiveness, 42.8% for perfectionism, 56.9% for drive for thinness, and 65.5% for body dissatisfaction. Among boys, body dissatisfaction showed no additive genetic contributions, indicating significant shared and individual specific environment effects. The three other traits in boys showed significant additive genetic contributions, but were lower than in girls.

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**PALABRAS CLAVE**

Trastornos de la conducta alimentaria;  
Factores de riesgo;  
Adolescentes;  
Gemelos;  
Genética

*Conclusions:* With the exception of body dissatisfaction in boys, psychological traits of eating disorders show heritability patterns that differ according to sex.

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## Influencias genéticas y ambientales en rasgos psicológicos y actitudes alimentarias en una población escolar española

### Resumen

*Introducción:* La heredabilidad de los trastornos de la conducta alimentaria, como la anorexia nerviosa y la bulimia nerviosa, se ha estimado alrededor del 22% al 62%. El objetivo del presente trabajo es determinar la influencia de los factores genéticos y ambientales que contribuyen en la expresión de los factores psicológicos medidos a través del *Eating Disorders Inventory*, en función del sexo, en adolescentes de la Comunidad Valenciana (España).

*Material y métodos:* Quinientas ochenta y cuatro parejas de gemelos de 13 a 18 años de edad. Para determinar la cigosidad los profesores rellenaron un cuestionario de similitud física. Se aplicaron las subescalas del *Eating Disorders Inventory*, impulso a la delgadez, insatisfacción corporal, perfeccionismo e ineficacia. Se ha realizado una modelización de las mismas para establecer los componentes genéticos y ambientales (comunes y específicos) de su varianza.

*Resultados:* En las niñas las 4 variables mostraron un componente de heredabilidad, del 37,7% para la ineficacia, del 42,8% para el perfeccionismo, del 56,9% para el impulso a la delgadez y del 65,5% para la insatisfacción corporal. En los niños se descarta una influencia genética para la insatisfacción corporal, que aparece influenciada exclusivamente por factores ambientales. El resto de variables mostraron un componente heredable, pero en menor medida que en las niñas.

*Conclusiones:* A excepción de la IC en niños, las actitudes y comportamientos alimentarios muestran un patrón parcialmente heredable, que varía en función del sexo.

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## Introduction

The genetics of psychiatric disorders is complex, and it is complicated further by gene–gene and gene–environment interactions. Many genes interact, giving rise to the activation of multiple neuronal circuits resulting in the appearance of behavioural variations.<sup>1</sup> Studies of twins are a source of information about the genetic bases of complex traits; comparing monozygotic (MZ) and dizygotic twins (DZ) makes it possible to evaluate the importance of genetic variability in the likelihood of suffering a disease.<sup>2</sup>

The heritability of eating disorders (ED), their symptoms and behavioural traits have been evaluated using multiple records of twins in North American, Australian and European populations, among others. Anorexia nervosa (AN) has been found to be heritable in from 22% to 58% of cases,<sup>3–6</sup> while bulimia nervosa (BN) is so in from 55% to 62% of cases.<sup>3,5,7,8</sup> Abnormal eating behaviours such as “intentional weight loss”, “over-eating” and “gorging” have also been estimated to be heritable in from 14% to 51% of cases.<sup>9–11</sup>

Less is known about the genetic factors which influence the personality traits that are associated with ED. Perfectionism has been said to be heritable in 29%–42% of cases,<sup>12–14</sup> while for the desire to be thin (DT) this ranges from 44% to 59.4%,<sup>15,16</sup> for bodily dissatisfaction

(BD) from 49% to 60%<sup>15,17</sup> and inefficacy from 0% to 37%.<sup>12,16</sup> Nevertheless, no Spanish research has evaluated all of these psychological factors, which are ED risk factors, together in the same sample of twins.

The aim of our work was to evaluate the heritability of several core psychological aspects of ED measured using the “Eating Disorders Inventory” (EDI) in a sample of Spanish twins. This is the first such study to be undertaken in our country, and it analyses the influence of genetic factors in the expression of perfectionism, DT, BD and inefficacy according to sex.

## Material and methods

### The sample

The population and data of this study originate in an institutional project for the diagnosis and treatment of eating disorders which the Dirección General de Salud Pública and Consellería de Educación of the Valencian Autonomous Community (Spain) have been running for a decade (the DITCA project). Participation is voluntary and it is open to all of the schools in the Valencian Community. The overall purpose of the project is the primary prevention and early detection of

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