



A cross-cultural comparison between Spain and the USA: Temperament and character distribution by sex and age

Susana Al-Halabí^{a,*}, Rocío Herrero^b, Pilar A. Sáiz^a, María Paz García-Portilla^a, José M. Errasti^c, Paul Corcoran^d, María Teresa Bascarán^a, Manuel Bousoño^a, Serafín Lemos^e, Julio Bobes^a

^a Department of Psychiatry, School of Medicine, University of Oviedo. Centro de Investigación Biomédica en Red de Salud Mental, CIBERSAM. Julián Clavería 6-3°. 33006 Oviedo, Spain

^b Health Services of Asturias (SESPA). Álvaro Flórez Estrada s/n, 33006 Oviedo, Spain

^c Department of Psychology (Area of Personality, Evaluation and Psychological Treatment), University of Oviedo. Plaza Feijoo s/n. 33003 Oviedo, Spain

^d National Suicide Research Foundation. 1 Perrott Avenue, College Road, Cork, Ireland

^e Department of Psychology, University of Oviedo. Centro de Investigación Biomédica en Red de Salud Mental, CIBERSAM. Plaza Feijoo s/n. 33003 Oviedo, Spain

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ABSTRACT

The Unified Biosocial Theory of Personality developed by Cloninger has been applied in different cultures. Distribution by age and sex of the Temperament and Character Inventory (TCI) dimensions were assessed cross-culturally for samples in Spain and the USA. Three non-clinical samples were included: i) 404 participants from Asturias (Spain); ii) 240 participants from Burgos (Spain); and iii) 300 adults from St. Louis (USA). Each participant was assessed by means of the TCI. A significant negative correlation between NS and both HA ($r = -0.329$; $P < 0.01$) and P ($r = -0.217$; $P < 0.01$) was found in the study sample, as well as significant effects of age in NS, HA, RD, and C for women and in NS and HA for men, and also of sex in HA and RD. Personality dimensions for the two Spanish samples appear to be similar (differences in HA4 and RD) compared to those for the US sample (differences in NS, HA, RD and P). Findings support Cloninger's theory about differences between men and women, but not regarding the intercorrelations between temperament dimensions.

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1. Introduction

The study of personality is a field which has had to deal with numerous problems of concept and definition. Cloninger et al. (1993) formulated the Unified Biosocial Theory of Personality, which postulates that personality is structured around four primary temperament dimension – Novelty Seeking (NS), Harm Avoidance (HA), Reward Dependence (RD) and Persistence (P) – and three character dimensions – Self-directedness (SD), Cooperation (C) and Self-transcendence (ST). To measure these dimensions, Cloninger et al. (1994) developed the Temperament and Character Inventory (TCI).

The model has been applied in a variety of different cultures. Previous cross-cultural studies on Cloninger's scales have included samples from two or three countries using *t*-test comparison (Svrakic et al., 1991; Richter et al., 1999; Pélissolo and Lépine, 2000; Brändström et al., 2001; Dzamonja-Ignjatovic et al., 2010). The study by Brändström et al. (2001) was performed using three samples from Sweden, Germany, and the USA, which were individually matched for age-cohort and sex, and were representative of the normal population. The main finding was that

European samples appear highly comparable in score distributions for all dimensions – explained by the fact that the two European countries considered are in the same cultural region (Brändström et al., 2001). Another study by Richter et al. (2004) consisted in a cross-cultural comparison by means of ANOVA and *t*-test of personality traits between individuals from two very different cultures (Sweden and Iran) and refugees from one culture who had resettled several years earlier in the other (Iranians in Sweden). The differences between the Swedish and Iranian individuals were greater than those found between the Swedes and the refugees. (Richter et al., 2004).

As far as meta-analytic studies are concerned, Miettunen et al. (2006, 2007, 2008) have carried out three. The aim of the first study was to compare Cloninger's temperament dimensions across 20 countries. The main finding was that there were few major differences in the mean scores on Cloninger's temperament scales between the different countries. The means of HA and NS varied very little, and in that of P, the US sample scored higher than those from the other countries; the Japanese sample differed significantly in RD (Miettunen et al., 2006). In the second meta-analysis, the objectives were to estimate sex differences in temperament dimensions and study the effect of mean age of the sample and location of the study (Asia/other) on possible differences. It can be concluded that women scored consistently higher in HA and RD (Miettunen et al., 2007). Finally, the objective of the third study was to obtain estimates for the magnitude

* Corresponding author. Tel.: +34 985 102 735; fax: +34 985 103 552.

E-mail address: alsusana@uniovi.es (S. Al-Halabí).

of the correlations between Cloninger's temperament dimensions. The principal finding was a moderate negative correlation between NS and HA (Miettunen et al., 2008).

However, neither of these meta-analyses considered studies carried out with Spanish samples. Thus, the objectives of the present research are: i) to study distribution by sex and age of the TCI dimensions in a healthy Spanish sample; ii) to analyze Cloninger's model from a cross-cultural perspective with samples from Spain and the USA, in the same line as the study by Brändström et al. (2001), comparing the TCI mean scores of the sample recruited in the present study with one from the same cultural area [using a Spanish sample from a previous report (Mateos Agut and De la Gándara, 2001)] and also using for comparison the US sample from the original study by Cloninger et al. (1993); iii) to study the inter-correlation between Cloninger's temperament dimension and the meta-analysis results from 20 countries from Miettunen et al. (2008).

2. Method

2.1. Participants

The present study sample comprised 404 unrelated healthy subjects of Spanish Caucasian origin, resident in the region of Asturias (north-western Spain) and aged 20–60 years, with an average age of 40.96 ± 11.47 years for men and 40.10 ± 11.02 for women (50% males). Half (50.5%) of the men had attained a level of education beyond secondary, while the corresponding figure for women was 61.9%. Almost one in four men was either retired (10.9%) or unable to work (12.9%), compared to just 3% of the women. Homemakers accounted for 12.4% of the women and just 1% of the men. A higher proportion of women worked in public administration (36.6% vs. 21.3%), whereas farming/fishing/mining/building and other industries were predominantly male employment sectors (27.7% vs. 2.0%). As regards marital status, in both men and women, about 32% of the sample was single and roughly 53% were married.

These individuals were consecutively selected and evaluated by the same general practitioner after seeking medical care for an acute, non-serious medical event (e.g., cold, otitis, lumbago). Only those with no history of drug or alcohol abuse or dependence, without psychiatric disorder data in their clinical records, and without a personal or first-degree family history of psychiatric disorders were invited to take part, and participation was wholly voluntary and unrewarded. These criteria were intended to ensure that participants were really healthy. It is known that personality traits may be affected by various disorders, and given the heritability of some of them, we decided to establish as an exclusion criterion from the study those who had first-degree relatives affected by a mental disorder. Patients filled out the TCI in an office at the health centre. The Spanish version of the Mini-International Neuropsychiatric Interview (MINI, DSM-IV criteria) was used as a psychiatric screening interview – Axis I (Sheehan et al., 1997), and was applied by the general practitioner (previously trained for this purpose). Initially, 540 patients (by strict order of appearance during the field phase) were selected, of whom 66 (12.2%) were ruled out due to positive results in the MINI, while another 70 (12.9%) declined to participate.

The characteristics of the comparison samples were as follows: the Spanish sample comprised 240 healthy subjects aged 18–76 years from the region of Burgos (north-central Spain), balanced in accordance with the general Spanish population with regard to age and sex distribution (50% males), with an average age of 34.7 years for women and 34.6 for men. Mean age of the total sample was 34.65 ± 14.36 years. The sample was obtained from among the family members, supposedly healthy, of staff at a hospital in Burgos. All agreed to participate voluntarily (Mateos Agut and De la Gándara, 2001). The US normative data are based on a study of a community sample of 300 adults from the city of St. Louis (mid-USA). Participation in the study was requested as they entered a shopping mall whose customers were thought to be fairly representative of the general population of St. Louis. Participants, all aged 18 or over, were recruited sequentially, and were excluded only if they were in an oversampled gender-age group. Mean (\pm S.D.) age of the sample was 34.1 ± 12.9 years (range, 18 to 91 years). The women (35.5 ± 13.7 years) were slightly older than the men (32.7 ± 11.9 years) (Cloninger et al., 1993).

2.2. Procedure

Each participant completed the most commonly used version of the TCI (version 9), which assesses the personality traits of Cloninger's model by means of 240 true/false items. The TCI measures four temperament dimensions: novelty seeking (NS) – a heritable tendency to excitement in response to novelty; harm avoidance (HA) – a heritable tendency to inhibit behaviours for avoiding novelty and punishment; reward dependence (RD) – a heritable tendency to maintain response to reward signals; and persistence (P) – a heritable tendency to persevere despite frustration and fatigue. There are three character dimensions: self-directedness (SD) – the self-determination and ability to regulate behaviour to suit one's own goals and values; cooperativeness (C) – the identification with and acceptance of others; and self-transcendence (ST) – the identification with some form of spirituality (Tse and Bond, 2007). The descriptors

for low and high scores on TCI subscales are shown in Table 1 (adapted from Dzamonja-Ignjatovic et al., 2010).

2.3. Statistical analysis

Pearson's correlation coefficient was used to assess the linear association between temperament dimensions in the sample obtained in the present study. Gender and age differences relating to the TCI measures were assessed using *t*-tests. Bonferroni correction was used and statistical significance was set at a level of $P = 0.0016$. For studying differences according to age, the sample was stratified in the following groups: 21–30 years, 31–40 years, 41–50 years, and 51–60 years. Differences between the two Spanish samples and between the Spanish sample and the US sample were also assessed using *t*-tests. SPSS version 15.0 (SPSS Inc., Chicago, Illinois, USA) was used for the statistical analyses.

3. Results

3.1. Intercorrelation between temperament dimensions

Table 2 shows the correlations between NS, HA, RD and P, respectively, and in comparison to the meta-analysis results from 20 countries (Miettunen et al., 2008). There was a significant negative correlation between NS and both HA and P. The negative correlation between HA and P is weaker in Spain than internationally.

3.2. TCI dimensions by sex and age

The mean scores and standard deviations for the sample by sex on the TCI scales and subscales are shown in Table 3. Significant differences were found according to sex in the dimensions HA [$t = -2.46$, $P = 0.014$] and RD [$t = -3.17$, $P = 0.002$], as well as on three temperament subscales [HA1: $t = -2.05$, $P = 0.041$; HA2: $t = -4.76$, $P < 0.001$; and RD1: $t = -3.94$, $P < 0.001$] and on two character subscales [C5: $t = 2.6$, $P = 0.010$; ST3: $t = -2.81$, $P = 0.005$].

Table 1
Description of TCI subscales.

Personality traits	High score	Low score
Temperament		
Novelty seeking (NS)		
NS1: exploratory excitability	Exploratory	Reserved
NS2: impulsiveness	Impulsive	Deliberate
NS3: extravagance	Extravagant	Thrifty
NS4: disorderliness	Irritable	Stoical
Harm Avoidance (HA)		
HA1: worry and pessimism	Pessimistic	Optimistic
HA2: fear of uncertainty	Fearful	Daring
HA3: shyness	Shy	Outgoing
HA4: fatigability	Fatigable	Energetic
Reward dependence (RD)		
RD1: sentimentality	Sentimental	Detached
RD3: attachment	Warm	Cold
RD4: dependence	Appreciative	Independent
Persistence (P)	Determined	Spoiled
Character		
Self-directedness (SD)		
SD1: responsibility	Responsible	Blaming
SD2: purposefulness	Purposeful	Aimless
SD3: resourcefulness	Resourceful	Inept
SD4: self-acceptance	Self-accepted	Vain
SD5: congruent second nature	Disciplined	Undisciplined
Cooperativeness (CO)		
C1: social acceptance	Tenderhearted	Intolerant
C2: empathy	Empathic	Insensitive
C3: helpfulness	Helpful	Hostile
C4: compassion	Compassionate	Revengeful
C5: pure hearted	Principled	Opportunistic
Self-transcendence (ST)		
ST1: self-forgetful	Intuitive	Contrived
ST2: transpersonal identification	Acquiescent	Controlling
ST3: spiritual acceptance	Spiritual	Materialistic

Adapted from Dzamonja-Ignjatovic et al., 2010.

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