Comparación de la salud subjetiva entre prototipos de personalidad recuperados en población general de México

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Resumen

El objetivo de este estudio fue obtener prototipos de personalidad en población general de México y comparar la salud subjetiva entre ellos. En total, participaron 994 individuos de 14 a 63 años de edad. Se evaluaron cinco rasgos de personalidad (Neuroticismo, Extraversión, Apertura, Responsabilidad y Amabilidad) con el NEO-FFI, y la salud subjetiva con el GHQ-12 y una pregunta sobre el estado de salud. Para corroborar la consistencia de los prototipos se dividió la muestra en dos grupos de edad: joven (de 14 a 25 años) y maduro (de 26 a 63 años). Y como resultado se recuperaron tres prototipos en ambos grupos: las personas *Resilientes* —bajo neuroticismo y alto en el resto de los rasgos—, quienes tuvieron la mejor salud subjetiva; las *No-Resilientes* —alto neuroticismo y bajo en el resto de los rasgos—, que presentaron la peor salud subjetiva; y las personas *Disciplinadas* —alto en responsabilidad y promedio en los otros rasgos—, que presentaron una salud subjetiva intermedia en comparación con los otros prototipos. Finalmente, la autodisciplina y la resiliencia fueron los rasgos que discriminaron mejor la buena salud. Los hallazgos se discuten en términos de la generalización de prototipos a través de culturas.
Palabras clave: Disciplinado, no-resiliente, personalidad, prototipos, resiliente, salud.

Comparison of subjective health between personality prototypes extracted from general population of Mexico

Abstract

The objective of this study was to extract personality prototypes from general population of Mexico and to compare subjective health indicators between these prototypes. Participants were 994 individuals (aged 14 to 63 years). Five personality traits (Neuroticism, Extraversion, Openness, Conscientiousness, and Agreeableness) were assessed with the NEO-FFI. Subjective indicators of health (self-rated health and psychological distress) were assessed with a question regarding health status and the GHQ-12. To verify the consistency of the prototypes, the sample was divided into two age groups, young (14 to 25 years) and mature (26 to 63 years.). Three stable prototypes were recovered from both groups. Resilient individuals (low neuroticism and high in other traits) had the best subjective health; the Non-Resilient individuals (high neuroticism and low in other traits) had the worst subjective health; and Self-Disciplined individuals (high conscientiousness and medium scores in other traits) were in the middle of these extremes in subjective health. Self-discipline and resilience were most discriminative in terms of subjective health. Findings are discussed in terms of the generalization of prototypes across cultures.
Key words: Self disciplined, non-resilient, personality, prototypes, resilient, health.

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Comparação da saúde subjetiva entre protótipos de personalidade em população geral do México

Resumo

O objetivo deste estudo foi obter protótipos da personalidade em população geral do México e comparar a saúde subjetiva entre eles. No total, participaram 994 indivíduos de 14 a 63 anos. Avaliaram-se cinco traços de personalidade (extroversão, neuroticismo, abertura à experiência, conscienciosidade e amabilidade) com o NEO-FFI, e a saúde subjetiva com o GHQ-12, e uma pergunta sobre o estado de saúde. Para corroborar a consistência dos protótipos, dividiu-se a amostra em dois grupos de idade: jovem (de 14 a 25 anos) e adulto (de 26 a 63 anos). Como resultado, obtiveram-se três protótipos em ambos os grupos: as pessoas *resilientes* —baixo neuroticismo e alto nos demais traços—, os que tiveram a melhor saúde subjetiva; as *não resilientes* —alto neuroticismo e baixo no restante dos traços—, que apresentaram a pior saúde subjetiva, e as pessoas *disciplinadas* —alto em conscienciosidade e média nos outros traços—, que apresentaram uma saúde subjetiva intermediária em comparação com os outros protótipos. Finalmente, a autodisciplina e a resiliência foram os traços que melhor discriminaram a boa saúde. Os achados são discutidos em termos da generalização de protótipos através de culturas.
Palavras-chave: disciplinado, não resiliente, personalidade, protótipos, resiliente, saúde.

INTRODUCTION

One of the main proposals for the study of personality which has achieved considerable support is the taxonomy of personality represented by the Big Five Traits model, also known as Five-Factor Model (FFM; Garcia, Aluja & Garcia, 2004; Hoyle, 2010). The NEO Personality Inventory (NEO-PI-R) (Smith, Williams & Segerstrom, 2015) and a short version of the same known as the NEO-FFI, are probably the most well-known instruments to assess personality traits within the Five-Factor Model. These two instruments, characterized as self-reports assess the following dimensions: *Neuroticism* (N: anxiety, hostility, depression, social anxiety, impulsivity and vulnerability to stress); *Extraversion* (E: warmth, gregariousness, assertiveness, activity, excitement seeking and positive emotions); *Openness to Experience* (O: fantasy, aesthetics, feelings, actions, ideas and values); *Agreeableness* (A: trust, straightforwardness, altruism, compliance, modesty and tendermindedness); and, finally, *Consciousness* (C: order, dutifulness, achievement striving and self-discipline) (Costa & McCrae, 2008).

Personality studies within the Five-Factor Model can be divided into two broad approaches (De Fruyt, Mervielde & Van Leeuwen, 2002). The first one, known as variable-centred approach, conceptualizes personality in terms of individual differences among people; in this proposal, each one of the dimensions of the NEO-FFI describes differences across individuals with any number of variables as the primary research goal (e.g., Roberts, Kuncel, Shiner, Caspi & Goldberg 2007). The second approach is the typological, or person-centred, which is founded on the configuration or set of attributes that define each individual, and based on this notion, it can group individuals with a similar personality pattern and explore the relationships with the variables of interest (Xie, Chen, Lei, Xing & Zhang, 2016).

According to Donellan and Robins (2010), the Resilient, Overcontrolled, and Undercontrolled personality types were identified for the first time by Robins, John, Caspi, Moffitt, and Stouthamer-Loeber (1996). Studies have found that the three types are replicable and have been reported to have external validity to predict behavior problems, as well as being useful in research and for applied purposes (e.g., Asendorpf, Borkenau, Ostendopf & Van Aken, 2001; De Fruyt et al., 2002; Van Leeuwen, De Fruyt & Mervielde, 2004).

In terms of the outstanding traits of the types, *Resilient* people show low scores in *Neuroticism* and relatively high scores in the rest of the dimensions; these people have been described as emotionally stable, assertive and kind toward others. *Overcontrolled* individuals have a high score in *Neuroticism* and low in *Extraversion*, with relatively low or average scores in the other dimensions; these people have been described as emotionally brittle (anxious or tense), and introverted. The characteristics of the *Undercontrolled* individuals are low scores in *Agreeableness* and *Consciousness*, and mean scores in the other dimensions; they are described as people with lack of self-control, are excitement seekers and oriented to actions (antisocial behavior). Multiple findings confirm that these personality types are associated with psychological and social variables in all developmental stages of individuals (Akse, Hale, Engels, Raaijmakers & Meeus, 2007; Hart, Burock, London, Atkins & Bonilla-Santiago, 2005; Klimstra, Hale, Raaijmakers, Branje & Meeus, 2010; Steca, Alessandri & Caprara, 2010; Van Leeuwen et al., 2004).

In spite of the above, the person-centred approach to personality description is just emerging, particularly in

Latin-American countries and, moreover, it is no stranger to controversy. This paper does not intend to elaborate on all outstanding issues since there are excellent reviews on the subject (Caspi, 1998; Donellan & Robins, 2010; Herzberg & Roth, 2006; Miller, 2012), but it seeks to explore the most remarkable contradictions and the possible reasons for them. Thus, it is necessary to consider the following:

1. Some authors have pointed out the lack of consistency within the personality types. For example, Herzberg and Roth (2006), in their analysis of seven studies, show that unlike other dimensions, *Neuroticism* is consistent in *Resilent* and *Overcontrolled* people, but not so the other traits. For example, they found that traits such as *Extraversion* and *Openness*, of the *Undercontrolled* type, varied greatly in *z*-scores (from < 0.05 to > 0.50). This lack of consistency within a personality type is a problem, and this variability can be worse if researchers are using the same label for what may be a different type, thus pretending homogeneity of types which is far from being perfect (Herzberg & Roth, 2006). Related to the above, Donellan and Robins (2010) report studies that found a "*Nondesirable*" type, instead of the *Undercontrolled* which resembles the reverse type of *Resilient* -high score in *Neuroticims* and low in the rest of the traits-. But it seems that it would be more appropriate to name it *Non-Resilient*, as suggested by Zawadzki and Strelau (2003). Configurations with four and five types have also been reported (Isler, Liu, Sibley & Fletcher, 2016); for example, with five types which include the *Confident* -relatively high scores in *Openness* and *Extraversion*- (Herzberg & Roth, 2006) and in other cases, the *Reserved or Discrete* -with low scores in *Openness*- (Roth & von Collani, 2007) whereas others include the *Reserved* and *Ordinary*- mean scores in all traits - (Kinnunen et al., 2012).

2. A problem that can be related to the above is the use of cluster analysis. This has been the preferred method, particularly with Ward analysis, followed by K-Means procedure (Akse, Hale, Engels, Raaijmakers & Meeus, 2004; Chapman & Goldberg, 2011; Steca et al., 2010). However, Donellan and Robins (2010) argue that when using that method, multiple analyses of the data are not carried out, or subsamples are not obtained. For example, in the studies reviewed by Herzberg and Roth (2006), the samples ranged from 156 to 786 individuals, but in a number of studies these were divided in half with the purpose of demonstrating the criterion of replicability of the types. In doing so, the samples were much lower than 500, and it is argued (Steinley, 2003) that they are therefore inadequate to obtain stable classifications. In addition, several samples did not correspond to the general population, nor were homogeneous in one variable (e.g., university students).

This can lead to greater or lesser prevalence of personality disorders affecting the recovery of personality types (Donellan & Robins, 2010).

3. It is also of interest to consider that not all dimensions that supposedly characterize each type behave the same through studies. For the *Resilient* type, most of the studies agree in a low score in *Neuroticism* and high in the rest of the dimensions. But other works indicate mean scores in all dimensions and low in *Neuroticism* (Van Leeuwen et al., 2004); or relatively high in *Extraversion* and *Consciousness* but low in *Neuroticism* (Ekehammar & Akrami, 2003). For the *Overcontrolled* type they coincide in high score in *Neuroticism* and low in *Extraversion*; but other studies indicate mean or low scores in the rest of the traits (Donellan & Robins, 2010), or high in *Neuroticism* and *Consciousness,* and low in *Extraversion* and *Openness* (Herzberg, 2009). For the *Undercontrolled* type there is a great variability and only coincides in low score in *Consciousness* and in some cases in *Agreeableness*, with some other exceptions (Ekehammar & Akrami, 2003) or in greater detail, Donellan & Robins (2010) and Herzberg & Roth (2006). As a result, these findings generate uncertainty about the characteristics of the personality types. In addition, an aspect missing in the studies is about the quantitative criterion to identify high or low scores. This is important because, as happens in a study which does specify standard deviations below or above the arithmetic mean of the traits to classify the types (De Fruyt et al., 2002), it prevents inaccurate interpretations about what it means "slightly low or relatively high scores".

4. Researchers have argued that contradictory results are likely due to other sample characteristics, such as sex, age, and culture (Herzberg & Roth, 2006). Regarding sex, no consistent evidence was found that this variable should be controlled. In terms of age, there are few studies, like the one by De Fruyt et al. (2002) where the three types of personality were not recovered in samples of different ages. Other investigators argue that since the traits are related to age, it is likely that this variable has an effect on the prototypes (Strus, Cieciuch & Rowinski, 2014). Regarding culture, in Philippines' university students, two of the three most common types were recovered in both women and men, but investigators extracted other types also. Avdeyeva and Church (2005) conclude that support for cross-cultural generalization is partial. No studies were found in the Latin American population, although in Spain the three types have been replicated with a student sample, but not with one of the general population (Boehm, Asendorpf & Avia, 2002). Recently, Alessandri et al. (2014) recovered the three types from university students (*n's* from 235 to 499), although with some variations; anyhow, the authors considered that

the transcultural generalization was relatively good among the countries studied (Spain, USA, Italy and Poland). Either way, it is premature to draw conclusions about the effect of culture since most of the studies have been performed in industrialized countries, particularly in Europe. In contrast, in the first study in Chinese adolescents, Xie et al. (2016) only recovered the *Resilient* and *Undercontrolled* types (the last has the lowest consistency in European studies), and two others, named *Ordinary* and *Withdrawn.*

5. Finally, an important distinction on the conceptualization of personality types as labels or as categories that are found in nature, is discussed. The generalized perspective looks at the types as appropriate labels to summarize the information of personality and it is recognized that does not reflect biological categories, but rather relative distinctions between people. For these and other reasons (see Donellan & Robins, 2010) it seems more appropriate to use the term *prototype* rather than *type*, as has been suggested by several authors (Weir & Gjerde, 2002). *Prototype* indicates preeminence, synonym of the first mold or model, and should not be confused with a consolidated or final status. However, in research these labels are interchangeably referred to as types, profiles or prototypes of personality.

Based on the above, the present study addresses two questions regarding whether it is possible to derive the most common personality prototypes from the general population of Mexico and whether it is possible to corroborate differences in subjective health among the recovered prototypes. Despite the fact that several studies support the cross-cultural generalization of the FFM, at present this is questioned (see: Church, 2016). And, given the above considerations, to replicate the prototype studies is of great importance in Latin-American countries, because, as far as it is known, no evidence has been obtained in favor of or against such generalization. In this context, it seems premature to establish hypothesis; however, it would be expected to recover at least the three most common prototypes (*Resilient, Overcontrolled, and Undercontrolled*) and perhaps others.

On the other hand, it is important to compare subjective health indicators by prototypes, considering that studies in developed countries have found that people with high *Neuroticism* perceive themselves as having a poorer health status and more physical illnesses than individuals with lower *Neuroticism.* In general, *Neuroticism* has been associated with a negative impact on health in both subjective and objective measures; while Consciousness has been associated with positive outcomes (Lahey, 2009; Roberts, Kuncel, Shiner, Caspi & Goldberg, 2007).

For example, Kinnunen et al. (2012) studied the personality prototypes and health of 304 adults. They included objective measures (e.g., body mass, blood pressure, etc.) and subjective health indicators. The latter were assessed in three ways: the health status was obtained by means of a question regarding how participants would describe their health in the last year; through a health interview to assess physical symptoms, and with the GHQ-12 as a measure of psychological distress. Prototypes were formed based on the NEO-FFI scores using a latent profile analysis (clusters of traits) and were referred as *Resilient* (low N-high in the other traits), *Overcontrolled* (high in N-low in E), *Undercontrolled* (high in O and E-low in C and N) *Reserved* (low in N, E, O, and A-high in C) and *Ordinary* (profile zero in the latent model for all of the traits). Regarding significant differences, the *Resilient* people had the best subjective health. *Overcontrolled* individuals had the poorest subjective health. The other three profiles were in the middle of these two extremes.

In summary, the objective of the present study was to extract personality prototypes from the general population of Mexico and to compare subjective health indicators among them. It was planned to include, in addition to the GHQ-12 as a measure of health, a question similar to the one made by Kinnunen et al. (2012). It should be added that analysis by sex was considered due to the evidences that indicate that men have a better self-perceived health than women, who more frequently present physical and psychological symptoms (Kaleta, Polańska, Dziankowska-Zaborszcsyk, Hanke & Drygas, 2009). Analysis by sex for the prototypes were not performed because previous findings showed no consistent sex-differences (Borkenau, Hrebickova, Kuppens, Realo & Allik, 2013). It is expected that the results provided in this study offer knowledge on the subject in Latin-America for the first time.

METHOD

This is a cross-sectional descriptive study.

Participants

Bearing in mind that the state-of-the-art studies on prototypes were taken into account, it was planned to obtain a larger sample and split it into two age groups, thus generating a young group and a mature group. A sample of 1440 participants was calculated by using a non-probability cluster sampling, using sex and chronological age as criteria. The study had a 69% response rate, so the sample was composed of 994 individuals living in 13 counties in four

different states of Mexico (i.e., Jalisco, Veracruz, Colima and Michoacán).

Ages ranged from 14 to 63 years. Men (*n* = 413) had a mean age of 31.6 yrs (*SD* = 13.1) and women (*n* = 581) 28.3 yrs (*SD* = 11.8). The percentages of the major demographic variables were:
• Marital status: 64.6 single, 29.0 married, 3.7 with a partner, 1.7 divorced, and 1.0 widowed;
• Educational level: 1.1 without studies, 5.1 elementary school, 9.2 junior high school, 25.3 high school, 14.4 technical school, 38.6 bachelor's degree, and 6.3 graduate or postgraduate degree;
• Current occupation: 51.7 student, 9.4 blue-collar worker, 10.2 house-keeper, 9.6 trader, 3.4 technician, and 15.8 professional.

None of the participants reported a history of mental or psychiatric disorders and all of them signed the respective letter of informed consent. For minors (7.5%), their parents signed an informed consent.

Instruments

Socio-demographic questionnaire Data on age, marital status, educational level, and the current occupation were collected. In addition, the participant was requested to answer the question: "Do you have any health problems?"

General Health Questionnaire (GHQ-12). The GHQ-12 evaluates the self-perceived health as well as the general health status (Goldberg and Williams,1988). It is recognized for its usefulness as a screening measure of the subjective general health status and some mental dysfunctions. It is presented in a Likert-type scale with four answer choices: never (0), sometimes (1), almost always (2) and always (3). In this study, the 12 items were divided based on the wording in positive or negative format, with six items in each subscale; the higher the score, the greater the dysfunction. For descriptive purposes internal consistencies (Cronbach's alpha) are reported for the full scale (.80), for positive items (.85) and for negative ones (.82). Other authors have reported alpha values of .81, .85, and .82, respectively (Solís-Cámara et al., 2016). The version used was the same with which the factorial structure of the GHQ-12 was demonstrated in general population of Mexico (Solís-Cámara et al., 2016).

It should be mentioned that the GHQ is probably the most widely recognized instrument in the world to assess the degree of perceived health and the 12-item version has been identified as the most widely used because of its ease of administration (Sánchez-López & Dresch, 2008). Is a screening tool for mental health that is significantly associated with multiple physical disorders (González et al., 2012, Tuuliainen / Kirsi Sipilä, Mäki, Könönen & Suominen, 2015), and has been the recommended version for Health surveys (McDowell, 2006). However, it seems necessary to take into account that Hankins (2008) showed that factorial analyzes that support the multidimensional nature of GHQ-12 do not take into account that negatively formatted items generate spurious factor divisions (two or three) due to negative format responses. Studies in many countries, including Mexico, have confirmed this error of the method in GHQ-12, and have suggested, among other options, to separate positive and negative items from the instrument to have a general screening method for subjective health or psychological distress (Smith, Oluboyede, West, Hewison & House, 2013; Solís-Cámara, Meda Lara, Moreno-Jiménez & Juárez, 2016; Urzúa, Caqueo-Urizar, Bargsted & Irarrázaval, 2015).

NEO-Five Factors Inventory (NEO-FFI (Costa & McCrae, 2008). The Spanish version of the instrument (Costa & McCrae, 2008) was used because on the date the study was conducted, there was no version of it validated in Mexico, and it was only until recently when a 30 items version was proposed (Meda Lara, Moreno-Jimenez, Garcia, Palomera Chávez & Mariscal de Santiago, 2015). The NEO-FFI evaluates the dimensions of the FFM: Neuroticism, Extraversion, Openness to experience, Agreeableness and Consciousness (N, E, O, A, C, respectively). It is suitable for adolescents and adults, and consists of 60 items, divided into five scales with 12 items each.

The NEO-FFI is presented in a five-point Likert type format: strongly agree, agree, neutral, disagree and strongly disagree; high scores indicate greater expression of the trait. Cronbach's alpha coefficients obtained in this study were: N (.78), and E (.81), O (.73), A (.71), C (.81). If .75 is considered as acceptable reliability, three dimensions meet the criterion and two are slightly below it (Hernández, Fernández & Baptista, 2010). Other studies report .86, .77, .73, .68 and 0.81 (Costa & McCrae, 2008); or .83, .78, .67, .67 and .84, respectively (Martinez & Cassaretto, 2011).

It should be mentioned that the NEO-FFI, was chosen to assess the personality, and the conglomerate analysis method, to recover the prototypes. In addition, the quantitative criteria by De Fruyt et al. (2002) were taken into account to identify the prototype scores. In general, the *Resilient* was identified by a low score in N (half standard deviation below average) and high scores (+ ½ *DE*) in the other dimensions; The *Overcontrolled* by a high score in N (+ ½ *DE*), low in E (-½ *DE*) and average in the rest of the dimensions; And the *Undercontrolled* by a low score

in C (between -½ and 1 *DE)* and in A (-½ *DE*) and average in the other dimensions.

Procedure

The instruments and the letter of informed consent were converted to electronic format with the SurveyMonkey software; these were sent to the email address of potential participants who were mainly students and university teachers, housewives, blue-collar workers and traders residing in the states of Mexico mentioned above. For this study, the 2004 Declaration of Helsinki and the Ethics Code of Psychologists (Mexican Psychological Society, 2007) were taken into account, ensuring the integrity of the participants and the confidential use of the data. The project was endorsed by the Ethics Board of the University of Guadalajara.

Statistical Analysis

Data analyses were performed with the SPSS-21 statistical package. Internal consistencies (Cronbach's alpha) of the NEO-FFI scales and, separately, for the positive and negative items of the GHQ-12, were obtained. Skewness and kurtosis of the study's main variables were analyzed to know their normal distribution fit.

In order to achieve replicability of the cluster solution, the sample was split into two age groups (young and mature). A full two-step clustering analysis was performed with each group. The prototypes were derived by applying a two step clustering procedure, which assumed variables as typified (N, E, O, A and C), measurement of the Euclidean distances, with automatic number of clusters (up to 15), and with management of noise (25%). In order to carry out the hierarchical analysis method of Ward, the silhouette measure of cohesion and separation was used, with quality cluster criterion between >0.5 and the closest to 1.0 (i.e., good quality). After this, the non-hierarchical K-means clustering procedure, without updated means, was performed. The prototypes retained after the two-step clustering analysis were analyzed via *Chi^2 to* establish size differences and sex distribution. Factorial ANOVA and univariate analysis were included to determine effects by age, gender and their interaction. Post-hoc analyses included a conservative method (Scheffe test) and a suitable one to correct for multiple comparisons (Hochberg's GT2).

Finally, in order to analyze prototype differences in subjective health, raw scores were converted into *z* scores, like other studies have done (eg., Kinnunen et al., 2012). GHQ scores were analyzed by gender via the Student *t* test for independent samples, including the Levene's test for equality of variances, the standard error and confidence intervals.

RESULTS

This section presents a descriptive analyses of the sample divided by age group, followed by an analyses to determine the number of clusters to retain. Three prototypes are discussed in detail in terms of the five dimensions of personality. Finally, comparisons in subjective health by prototypes and sex in the two age groups are presented.

The sample was split into two groups, according to their mean age: young (14 to 25 yrs; *M* = 19.9, *SD* = 2.43) and mature (26 to 63 yrs; *M* = 41.2, *SD* = 9.42). The young group (YG; *n* = 541) was formed by 340 women (62.8%) and 201 men (37.2%) and the mature group (MG; *n* = 453) was formed by 241 women (53.2%) and 212 men (46.8%). Table 1 shows, for descriptive purposes, means, skewness, and kurtosis of the main variables for the total sample and by age group. Skewness and kurtosis of the majority of the variables indicate they fit the normal distribution and suggest that age concentrated slightly in a young age and most answers to the question on health status ("do you have any health problems?") focused on the response "no" (71%), particularly in the YG that shows a mean of 1.80. On the other hand, slight positive skewness is observed for GHQ-negative items, which indicates that the values grouped around low scores.

Forming personality prototypes

The procedure was similar for both groups. In the young group (YG) the two step clustering procedure indicated two solutions with cohesion and comparison indicating good quality of the clusters (from >.05 and close to 1.0). The Ward method supported two-, and three-clusters solutions; the solution with two prototypes included one with a high score in N and low scores in the other traits, and the other was the opposite. The three-cluster solution was retained for further analysis rather than the two-cluster solution because it was thought that the latter was less enriching.

In the mature group (GM) the two step clustering procedure indicated four solutions with cohesion and comparison indicating good quality of the clusters (from >.05 and close to 1.0). The method of Ward supported three-, four-, and five-cluster solutions. Four- and five-cluster solutions were similar in three prototypes, but the other two had high or low scores in all traits. Finally, the three-cluster solution was retained for further analysis rather than the four and five-cluster solutions as it offered a more consistent solution with at least two of the three common prototypes and was similar in both age groups.

Table 1
Means, deviations, skewness and kurtosis of the variables for the total sample and by group

Variables	Total				GJ		GM	
	M	SD	S	K	M	SD	M	SD
Age in years	29.7	12.5	.80	-.69	28.3	11.8	31.5	13.1
Health status	1.71	.45	-.93	-1.14	1.80	.39	1.60	.49
Positive GHQ-items	7.28	3.79	-.02	-.23	6.85	3.82	7.78	3.70
Negative GHQ-items	5.58	3.94	.81	.19	6.05	4.05	5.00	3.71
Neuroticism	20.8	7.45	.12	-.04	21.4	7.59	20.2	7.23
Extraversion	29.8	7.49	-.28	.21	30.0	7.89	29.6	6.99
Openness	27.6	6.58	.31	.07	28.3	6.42	26.7	6.68
Agreeableness	28.1	6.50	-.12	-.02	27.7	6.56	28.5	6.41
Conscientiousness	30.2	7.08	-.04	-.23	30.2	7.37	30.3	6.73

Note: Total (n = 994). YG = young group. MG = mature group. S = skewness. K = kurtosis. GHQ = General Health Questionnaire.

Description of the prototypes

Table 2 presents the YG scores in the NEO-FFI by prototypes. The *Resilient* prototype was characterized by a score with a standard deviation below the mean in *Neuroticism* and high scores in *Extraversion* (+1 SD), *Openness* (+1/2 SD), *Agreeableness* (+1/2 SD), and *Conscientiousness* (+3/4 SD). The second prototype scored half-standard deviation above the mean in *Neuroticism* and had low scores in *Extraversion* (-1/2 SD), *Openness* (-1/2 SD), *Agreeableness* (-1/2 SD), and *Conscientiousness* (-3/4 SD), and therefore was named *Non-Resilient* prototype. The third prototype had average scores (not even half *SD* below or above the mean) in all dimensions, with the exception of the high score in *Conscientiousness* (almost +3/4 SD), and was interpreted as *Self Disciplined* prototype. This because *Conscientiousness* comprises traits such as order, organization and self-discipline.

The size of the prototypes was different $X^2(2)$ = 56.0, p < .000, with 28.3% of *Resilient*, 48.2% of *Non-Resilient* and 23.5% of *Self Disciplined*. Women were over-represented: in the *Resilient* prototype there were 99 women and 54 men; in the *Non--Resilient* prototype there were 148 women and 113 men and in the *Self Disciplined*, 93 women and 34 men. There were no age differences between prototypes ($F(2, 538)$ = 0.88, p > .05), nor meaningful interaction of age by prototype and sex ($F(2, 541)$ = 0.81, p > .05).

Table 3 presents the mean scores of the MG by personality prototypes. The *Resilient* prototype had the lowest score in Neuroticism (-1 SD), and high scores in the rest of the dimensions, all of them approximately with a standard deviation above the mean. The *Non-Resilient* prototype had the highest score in *Neuroticism* (+1/2), and low scores on *Extraversion* (-3/4 SD), *Openness* (-1/2 SD), *Agreeableness* (-1/2 SD), and *Conscientiousness* (-3/4 SD). The *Self*

Disciplined prototype was characterized by a pattern of scores around the mean or slightly above it (< ½ SD) in all dimensions, with the exception of the high score in *Conscientiousness* (+1/2 SD).

The size of the prototypes for the MG was clearly different, with 18.1% of *Resilient*, 44.8% of *Non-Resilient* and 37.1% of *Self Disciplined.* There were fewer women (33) than men (49) in the *Resilient* prototype ($X^2(1)$ = 3.12, p = .07). In the *Non-Resilient* prototype, women (n = 118) were significantly over represented ($X^2(1)$ = 5.36, p < .05), in comparison with men (n = 85). In the *Self Disciplined* prototype, sex (90 women and 78 men) was distributed more evenly ($X^2(1)$ = 0.86, p = .35). Age differences were observed between prototypes ($F(2, 453)$ = 3.75, p < .05) and by sex ($F(1, 453)$ = 10.0, p < .01), but no significant interaction was found ($F(2, 453)$ = 2.63, p > .05). Post-hoc analysis (Scheffe and Hochberg tests) were statistically significant (p < .05); *Self Disciplined* individuals were younger (M = 39.6, SD = 8.67) than *Non-Resilient* individuals (M = 42.4, SD = 9.6). In addition, women (M = 39.5) were younger than men (M = 42.6).

Differences in health by prototypes

In order to enhance comparability of subjective health indicators, raw scores on health status as well as on positive and negative items of the GHQ-12 were standardized (z-scores). These z-scores were compared by prototypes and sex for both age groups. For ANOVA statistically significant results, a conservative post-hoc test (Scheffe test) and Levene's test for equality of variances were performed on the data. Table 4 shows the results of these comparisons. It is important to clarify that the comparisons are mentioned as low or high scores with the intention of facilitating the communication of the results; however, it is known that

Table 2
Scores of personality traits by prototypes in the young group

Variables	Resilient		Non-Resilient		Self Disciplined	
	M	*SD*	*M*	*SD*	*M*	*SD*
Neuroticism (N)	14.3	5.04	26.1	6.13	20.5	5.44
Extraversion (E)	38.2	4.11	25.9	7.02	28.6	5.17
Openness (O)	32.1	5.68	26.3	5.78	27.7	6.54
Agreeableness (A)	31.9	6.61	24.2	5.40	29.9	4.49
Conscientiousness (C)	35.1	5.73	25.2	5.97	34.5	4.43

Note: Resilient (*n* = 153), Non-Resilient (*n* = 261), Self Disciplined (*n* = 127).

Table 3
Scores of personality traits by prototypes in the mature group

Variables	Resilient		Non-Resilient		Self Disciplined	
	M	DE	M	DE	M	DE
Neuroticism	11.7	4.08	24.4	5.71	19.1	5.99
Extraversion	37.0	4.74	24.3	5.08	32.3	4.76
Openness	34.8	5.50	23.4	5.10	26.8	5.43
Agreeableness	34.2	4.86	25.1	5.22	29.9	5.89
Conscientiousness	36.9	5.33	25.2	4.25	33.1	5.13

Note: Resilient (*n* = 82), Non-Resilient (*n* = 203), Self Disciplined (*n* = 168).

z-scores refer to number of units below (negative) or above the mean (positive). The first statistically significant result is presented with examples to further clarify the subsequent.

For the YG, no significant differences were found to the question concerning the health status. Regarding differences found in GHQ-positive and negative items, these were similar but clearer for the positive items than for the negative ones, and only these analyses are presented. *Resilients* had the lowest score in GHQ-positive (see Table 4); that is to say, the greatest number of units or deviations (-0.72) below the mean compared with the *Self Disciplined* and *Non-Resilient* individuals; these results indicated better general health or less perceived psychological distress. In addition, *Self Disciplined* individuals also had greater number of units (-0.19) below the mean than the *Non-Resilients* (0.29).

The sex difference (Table 4) was due to the fact that men (*n* = 201) had a lower score in the positive items (*M* = -.436, Standard Error = .072; IC 95% = -.576/-.295) than women (*n* = 340; M = -.112, Standard error = .050; IC 95% = -.210/-014). That is to say, women perceived more health problems. Independent samples *t*-tests were conducted to identify the interactions prototype-sex in the positive items. The scores for men (*M* = -.716, *SD* = .87) were lower than those for women (*M* = -.000, *SD* = .86) only in the *Self Disciplined* prototype (*t*(125) = -4.11, *p* < .001; mean difference = -.716; IC 95% for the difference = -1.06/-.371); thus, women in this prototype perceived more health problems.

Due to the sex differences previously found, intra-sex comparisons were done in order to explore more in depth these effects. Differences in women were found among the *Resilients* (*M* = -.672, *SD* = .82) and *Non-Resilients* (*M* = .335, *SD* = .97; (*t*(245) = -8.420, *p* < .001) and the *Self Disciplined* women (*M* = -.000, *SD* = .86; *t*(190) = -5.488, *p* < .001); there was also a difference between these last two prototypes (*t*(239) = 2.702, *p* < .01); and, in all of these comparisons, the *Non-Resilients* showed the worst subjective health, but the *Resilients* had a significantly lower score than the other prototypes and, therefore, better subjective health. In the case of men, *Resilients* (*M* = -.815, *SD* = .79) and *Self Disciplined* individuals (*M* = -.716, *SD* = .87) had similar scores (*t*(86) = 0.543, *p* = .58). And both *Resilients* (*t*(165) = 7.04, *p* < .001) and *Self Disciplined* men (*t*(145) = 5.23, *p* < .001) had lower scores than *Non-Resilients* (*M* = .224, *DE* = .93). For this reason, *Non-Resilient* men also showed a poorer subjective health.

In the comparison of the prototypes regarding health indicators, the ANOVA for the MG resulted in no significant effects by sex or interactions (prototype x sex). Significant differences by prototypes were found to the question concerning the health status. Since the question was answered with a *yes* or a *no*, the positive responses indicate a larger negative *z*-score (see Table 4). The Levene test for equality of variance was significant (*F*(5, 447) = 8,148, *p* < .001). *Resilient* individuals (*M* = -.122, Standard Error = .121; IC 95% = -.360/.116) had a score similar to *Self Disciplined*

individuals (M = -.113, Standard Error = .083; IC 95% = -.276/.050), and only *Resilients* scored significantly lower (p < .05) than *Non-Resilients* (M = -.390, Standard Error = .076; IC 95% = -.540/-.240), both with the Scheffe and the Hochberg test. Although this difference appears to be marginal, the percentages of the "*yes*" responses to the health question, by prototypes, were clearly different: *Resilients* (15.5), *Non-Resilients* (46.8) and *Self Disciplined* individuals (32.0).

Table 4 also presents the differences by prototypes for the MG. *Resilient*s had the lowest score in GHQ-positive, the greatest number of units or deviations (-0.56) below the mean compared with the *Self Disciplined* individuals and the *Non-Resilient* ones. This indicates the *Resilients* had the best self-rated health, or, if prefered, the lowest perceived distress. In addition, the *Self Disciplined* individuals also had a greater number of units (-0.06) below the mean than the *Non-Resilients*, whose units were above the mean (0.57).

DISCUSSION

The objective of this study was to extract personality prototypes from the general population of Mexico and to compare subjective health indicators among them. The common method to find prototypes has been cluster analysis. Considering that this method is dependent on the sample characteristics, the use of a larger sample splitted into two groups or the inclusion of two samples are common criteria

to confirm the prototypes; this strategy is regarded as a type of replication or validation of the recovered prototypes (e.g., Herzberg & Roth, 2006). In addition, although age effects on the prototypes are not consistent, to minimize their potential effects on the composition of the sample for this study, this was divided arbitrarily into two large age groups: the young group (YG) in a narrow range (14-25 years) and a mature group (MG) with a wide range of ages (26-63 years).

Three prototypes were consistent in both groups. The *Undercontrolled* was not found which, as we saw earlier, is the least consistent. Two of the recovered prototypes correspond to the commonly in a large number of countries, particularly in Europe (Alessandri et al., 2014; Donellan & Robins, 2010; Herzberg & Roth, 2006). In both age groups, the *Resilient* was characterized by a low score in *Neuroticism* and high scores in the dimensions of *Openness to experience*, *Agreeableness* and, above all, in *Extraversion* and *Conscientiousness*; this configuration is similar to other studies (Herzberg, 2009; Herzberg & Roth, 2006; Kinnunen et al., 2012).

The prototype traditionally known as *Overcontrolled* has been labeled in other studies as *Non-Desirable* (Barbaranelli, 2002). But in this study it was preferred to name it *Non-Resilient*, as proposed by Zawadzki and Strelau (2003), because it is clearly the opposite of the *Resilient* (Alessandri et al., 2014), and because it shows a low score in *Conscientiousness*, which has been related to self-control

Table 4

Differences in subjective health by prototypes and gender in young and mature groups

Young group	1. Resilient (n = 153)		2. Non-Resilient (n = 261)		3. Self Disciplined (n = 127)		Prototype differences	Gender effect	Interaction
	M	DE	M	DE	M	DE	F (2, 541)	F (1, 541)	F (2, 541)
Health status	.31	.80	.14	.92	.26	.85	1.92	1.06	.017
GHQ-Positive	-.72	.81	.29	.95	-.19	.92	62.1*** 1< 2, 3; 3 < 2	13.7***	4.34**
GHQ-negative	-.43	.72	.54	1.05	-.06	.92	52.3*** 1 < 2, 3; 3 < 2	12.3***	3.27**

Mature group	1. Resilient (n = 82)		2. Non-Resilient (n = 203)		3. Self disciplined (n = 168)		Prototype differences	Gender effect	Interaction
	M	DE	M	DE	M	DE	F (2, 453)	F (1, 453)	F (2, 453)
Health status	-.11	1.05	-.39	1.10	-.12	1.05	3.56* 1 < 2	1.29	.51
GHQ-positive	-.56	.84	.57	.88	-.06	.88	52.0*** 1 < 2, 3; 3 < 2	3.14	.63
GHQ-negative	-.63	.67	.12	.99	-.23	.88	19.6*** 1 < 2, 3; 3 < 2	1.57	.20

Note: for "health status" to more negative score, the groups agreed to have health problems. For GHQ to greater positive score, the groups presented greater health problem. ***.001; **.01; *.05.

(Strus et al., 2014); this prototype configuration is similar to others (e.g., Ekehammar & Akrami, 2003).

The third prototype obtained in this study presented scores closer to the average or slightly high (they did not reach ½ *SD* above the mean) in all dimensions, with the exception of *Conscientiousness*, where the score was higher, and hence it is named *Self Disciplined* prototype; the trait scores of this group were intermediate to those of the other two prototypes. Although it would seem at first glance that this prototype can be confused with "the authentic" *Overcontrolled*, because of its high score in *Conscientiousness* (between +1/2 and +3/4 DE), this does not comply with the low score on *Extraversion*, that most of the studies support (see revisions: Donellan & Robins, 2010; Herzberg & Roth, 2006). In fact, many studies that indicate having recovered the *Overcontrolled* prototype do not show agreement on the score of *Conscientiousness*; in some studies the scores were low (e.g., Barbaranelli, 2002; De Fruyt et al., 2002), in others around the mean (e.g., Asendorpf et al., 2001; Boehm et al., 2002), and in other studies the scores were higher (e.g., Van Leeuwen et al., 2004). Undoubtedly, this is one of the reasons for the contradictory findings mentioned extensively in this work.

In the young group the percentages of *Resilients* and *Self Disciplined* people were similar, but in *Non-Resilients*, the percentage was double. However, the distribution of prototypes in the mature group was very different. A minimum percentage corresponded to *Resilient* individuals, but again the *Non-Resilient* concentrated the majority of the people, with an intermediate percentage of *Self Disciplined* individuals. In some studies the prototypes were homogeneously distributed, one third for each (Herzberg, 2009), but this is not supported by other studies (Asendorpf et al., 2001; Bohem et al., 2002; Kinnunen et al., 2012; Van Leeuwen et al., 2004).

Until today, the reason for the heterogeneity in the size of the prototypes can be awarded vaguely to the sample characteristics. In any case, not only the size but the number of recovered prototypes add to the results that, throughout more than 20 years, have promoted the argument that it is premature to generalize prototypes in multiple cultures. Recent studies support the "traditional" solution of three clusters (Alessandri et al., 2014), as well as of four (Isler et al., 2016).

There is still not enough evidence to explain why there are differences in the prototypes' distribution between men and women. This is probably due to the heterogeneity of the results (Herzberg, 2009). In this work, the only consistent result was that women were over-represented in the *Non-Resilient* prototype, in both groups. And, for age, there were no consistent results. A result that draws attention to this study is the small size of the *Resilient* prototype in the MG. It should be recalled that in this group, from two to five clusters were extracted, but in the four- and five- cluster solutions, the *Resilient* prototype remained composed by the same individuals (data not shown). In addition, the four- and five- cluster solutions had a configuration with either high or low scores in all traits, which does not allow a clear interpretation. In any case, trying to explain the reason of findings such as the low number of *Resilients* compared with the high number of *Non-Resilients* as well as the finding of the *Self Disciplined* individuals, is a complex task in the absence of similar studies. However, there is an ethno-psychological theory for the Mexican culture with empirical evidence of personality types (Díaz-Guerrero, 2012), which, facing these results, seems appropriate to consider.

Díaz-Guerrero (2012) mentions eight personality types, product of a cultural pattern which favors authoritarian relationships and an important confusion between love and power (Díaz-Guerrero, 2012, p. 76). Four of these types describe the vast majority of Mexican people according to the evidence collected over more than 25 years: the *passive and obedient-affiliative*, the *active self-affirmative rebel*, the one with *active internal control*, and the one with *passive external control*.

It may be interesting to compare the characteristics attributed to these specific personality types of Mexicans with the prototypes proposed with an Universalist model, such as the FFM (Costa & McCrae, 2008). The *obedient-affiliative* is described as methodical, disciplined, orderly, plan their things, patient and cautious, and also displays little impulsivity, spontaneity and excitability. It is worth noting that the characteristics of this type are very similar to those of the prototype that was named *Self Disciplined*. particularly because in the latter the central feature is the self-discipline or self-control.

The *active self-affirmative* rebel shows characteristics of aggressiveness and dominance, and also exhibits impulsivity, emotional problems, anxiety, and adaptation problems; this type is very similar to the *Non-Resilient* prototype. The *active internal control* type, which is regarded as the least common of the Mexican types, is characteristic of committed individuals, ordered, less aggressive, and, above all, who exhibit more internal resources to address the problems. These personality traits resemble the *Resilient* prototype. Díaz-Guerrero (2012) indicates that the *passive external control* type resembles the *active self-affirmative rebel*, but with lower intellectual and academic skills. However, with data from the present study it is not possible to differentiate this type.

The prototypes recovered in this study were compared by subjective health indicators in two ways: First, through the question: "do you suffer from any health problem?," and second, with the GHQ-12 scores. There were no important differences in response to the question on health status in the young group, since the majority answered not having problems, as would be expected given their age. The *Non-Resilients* of the mature group, on the contrary, reported more health problems than the *Resilients*. As for the GHQ-12, the differences were significant for positive and negative items, although they were clearer for positive items in both groups. Thus, it is confirmed that the personality scores of *Resilients*, in both sexes, are associated with better subjective health, and the opposite configuration of the *Non-Resilient* or *Overcontrolled,* according to other studies (Chapman & Goldberg, 2011), is related to the worst health. To avoid confusion, it is important to clarify that Kinnunen et al. (2012) named *Overcontrolled* the prototype with similar configuration to the one called *Non-Resilient* prototype in this study.

Finally, it is concluded that the person-centred research is an important complement to the research of individual differences. To our knowledge, this is the first study of personality prototypes carried out in Latin America, which makes it difficult to compare the prototypes recovered in this study. However, the fact of having the *Resilient* and the *Non-Resilient* prototypes, as well as having recovered them in two age groups provides confidence in its consistency. More interesting is to have found the prototype named *Self Disciplined*, but more studies are needed to confirm this.

A limitation of this study is not having included objective health measures (e.g. body mass index, blood pressure, among others), but resources were not available to do so. However, person-centred studies favors the development of useful models to relate and/or predict behavior in real life, such as the health status of individuals. Thus, the fact that the prototypes showed differences in subjective health may be useful knowledge to be considered in the actions necessary to prevent non-transmittable diseases that adversely affect the Latin American population.

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