Spanish normative data of the Zuckerman-Kuhlman Personality Questionnaire in a general population sample

Montserrat Gomà-i-Freixanet and Sergi Valero Ventura*
Autonomous University of Barcelona, and * Hospital Universitari Vall d'Hebron de Barcelona

The Zuckerman-Kuhlman Personality Questionnaire (ZKPQ), a tool designed to measure the alternative five-factor model of personality, was translated and adapted into the Spanish language. To date, there appears to be no normative data for the ZKPQ in general population samples in any culture. The aim of this study was to obtain Spanish normative data for the scales and subscales in a community sample of the general population. The questionnaire was administered to 1,678 participants of both genders (55.8 % females) with ages ranging from 18 to 93 years. The magnitude of the sample, as well as an adequate representativity of both genders and the wide age range being considered, provides a satisfactory description of each scale and subscale of this instrument. The normative data obtained showed a normal distribution of the scales. The norms (means and standard deviations) are presented by gender and five age ranges and are adjusted according to the level of education attained. Gender differences are in accordance with data obtained with instruments measuring similar personality traits. This is the first time the normative data of the ZKPQ is reported in a general community sample in any culture.

Datos normativos españoles del Zuckerman-Kuhlman Personality Questionnaire en una muestra de población general. El Zuckerman-Kuhlman Personality Questionnaire (ZKPQ), un instrumento diseñado para la evaluación del modelo alternativo de los cinco factores de personalidad, ha sido traducido y adaptado a la lengua española. Hasta la fecha, no existen datos normativos en población general en ninguna cultura. El objetivo del presente estudio fue obtener datos normativos españoles de las escalas y subescalas en una muestra de la población general. El cuestionario fue administrado a 1.678 participantes de ambos géneros (55.8 % mujeres) con edades comprendidas entre los 18 y 93 años. La magnitud de la muestra, así como una adecuada representatividad de ambos géneros y el amplio rango de edad considerado, proporcionan una descripción satisfactoria de cada escala y subescala de dicho instrumento. Los datos normativos obtenidos mostraron una distribución normal de las escalas. Las medias y desviaciones estándar son presentadas por género y cinco rangos de edad, y ajustadas por el nivel de educación alcanzado. Las diferencias de género van en la misma dirección que las obtenidas con instrumentos que evalúan rasgos de personalidad similar. Esta es la primera vez que se refieren datos normativos del ZKPQ en una muestra de población general.

Zuckerman, Kuhlman, Joireman, Teta and Kraft (1993) have proposed an alternative five factor model (AFFM) of personality. This model emerged from a series of factor analyses of scales believed to measure basic dimensions of personality or temperament, particularly those used in psychobiological research (Zuckerman, Kuhlman, & Camac, 1988; Zuckerman, Kuhlman, Thornquist, & Kiers, 1991). Eysenck (1992) and Zuckerman (1992) pointed out that psychobiological studies of personality provide a better understanding of the neurobiological and genetic underpinnings of personality. Relying only on the encoding of personality traits in language may be treacherous, as this encoding

probably reflects the observability of these traits in social interactions and may not necessarily mirror the proportional biological relevance of the traits (Zuckerman, 1992; Zuckerman et al., 1993). Therefore, in contrast to the lexical approach, using psychobiological data allows researchers to explore the causal, biological origins of personality (Eysenck, 1992).

The Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) was developed to measure the dimensions that constitute the AFFM (Zuckerman, 2002; Zuckerman et al., 1993). The basic traits in the AFFM and measured by the Zuckerman-Kuhlman Personality Questionnaire are: Neuroticism-Anxiety (N-Anx), Activity (Act), Sociability (Sy), Impulsive Sensation Seeking (ImpSS) and Aggression-Hostility (Agg-Host). In this model, no measures of cultural interests or intellectual styles were included because of Zuckerman's (1984) conception that basic traits should be easily comparable to traits in other species and found throughout the human lifespan. Similarly, Aggression rather than Agreeableness, and Impulsive Sensation Seeking rather than

Conscientiousness were included. Furthermore, the broad dimension of Extraversion was divided into the separate factors of Activity and Sociability (Zuckerman, 2002) because in earlier studies Activity emerged as a distinct factor at the five-factor analyses of scales (Zuckerman et al., 1988; Zuckerman et al., 1991).

Due to its identification as a basic developmental trait (see, for example, Buss & Plomin, 1984; Thomas & Chess, 1977) activity level merits a distinctive assessment as a major trait of temperament in the child as well as of personality in the adult human. Moreover, the distinction between Hostility and Anxiety is also important because both traits have different psychobiological bases (Gray, 1982) and should not be confounded within a single factor. On the other hand, Impulsivity and Sensation Seeking are conceptually closely related and have many important psychobiological correlates (Zuckerman, 1983, 1984, 1991, 1994). Together with Socialization they form a distinctive factor in five-factor analyses of scales (Zuckerman et al., 1991) and of items. Finally, a measure of social desirability was also included in the questionnaire, named Infrequency scale (Infreq) to ensure none of the basic traits were affected by this response set bias and to control for inaccurate responding.

Since its first publication in 1993, the ZKPQ has undergone extensive psychometric testing, demonstrating good internal reliability, temporal stability, validity and cross-cultural replicability (Zuckerman, 2002). Concerning concurrent validity, for example, some studies have already been conducted, e.g., characteristics of drug abusers and prediction of therapy course (Ball, 1995), characteristics of psychopathology (Thornquist & Zuckerman, 1995; O'Sullivan, Zuckerman, & Kraft, 1996) and risk taking (O'Sullivan, Zuckerman, & Kraft, 1998; Zuckerman & Kuhlman, 2000). Several cross-cultural studies have also been performed as well using translations into other languages, e. g. German (Ostendorf & Angleitner, 1994), Japanese (Shiomi, Kuhlman, Zuckerman, Joireman, Sato, & Yata, 1996), Chinese (Wu, Wang, Du, Li, Jiang, & Wang, 2000), or Italian (De Pascalis & Russo, 2003) among others.

The ZKPQ has also been used with Spanish samples (Aluja, García, & García, 2004; Gomà-i-Freixanet, Valero, Punti, & Zuckerman, 2004; Gutiérrez-Zotes, Ramos, & Sáiz, 2001; Peñate, Ibáñez, & González, 1999; Romero, Luengo, Gómez, & Sobral, 2002). Gomà-i-Freixanet et al. (2004) have reported that the ZKPQ has shown good psychometric properties in non-clinical samples, with test-retest reliability coefficients over a 2-week period ranging from 0.77 to 0.91, internal consistency alpha coefficients ranging from 0.67 to 0.84, and convergent, discriminant and consensual validity (Gomà-i-Freixanet, Wismeijer, & Valero, 2005). The factorial structure has also been replicated with congruence coefficients ranging from 0.88 to 0.96, and from 0.84 to 0.92 in a female and male sample respectively (Gomà-i-Freixanet et al., 2004). This questionnaire has also been used with clinical samples (Gomà-i-Freixanet et al., in press) showing good discriminant properties.

However, even though this questionnaire has undergone much psychometric testing most of the data have been obtained with student's populations. Up to this point, there appears to be no normative data on the ZKPQ in general population samples in any culture. Such normative data are necessary to interpret the figures obtained with the ZKPQ, but are also of interest to address some cross-cultural issues about the assessment of personality in various countries, e.g. the US compared to European countries. Thus, the primary objective of this study was to obtain Spanish normative data for the scales and subscales of the ZKPQ in a community sample of the general population. These data are fundamentally important to interpret the scores obtained by one individual compared to his own group of reference, either in clinical or non-clinical samples.

Method

Participants

Our community sample consisted of 1,678 participants, 741 males (44.2%) and 937 females (55.8%). The age of the respondents ranged from 18 to 88 yrs for males and 18 to 93 yrs for females, with a total mean age of 40.26 yrs (SD= 18.84).

Instrument

The Zuckerman-Kuhlman Personality Questionnaire (ZKPQ; Zuckerman & Kuhlman, 1993) consists of 5 content scales, plus an Infrequency scale that allows eliminating subjects with careless responding. The ZKPQ has in total 99 dichotomous items (in sentence format and true-false response set). The five scales can be described in terms of their typical content:

1. *Neuroticism-Anxiety (N-Anx, 19 items)* items describe frequent emotional upset, tension, worry, fearfulness, obsessive indecision, lack of self-confidence and sensitivity to criticism.
2. *Activity (Act, 17 items)* items describe the need for general activity, an inability to relax and do nothing when the opportunity arises, and a preference for hard and challenging work, an active busy life and high energy level. Two facet scores can be obtained from this scale: Need for General Activity, impatience and restlessness (*GenAct, 9 items*) and need for Work Activity (*WorkAct, 8 items*).
3. *Sociability (Sy, 17 items)* items describe the number of friends one has and the amount of time spent with them, outgoingness at parties and a preference for being with others as opposed to being alone and engaging in solitary activities. Two facet scores can also be obtained: Parties and friends (*Parties, 9 items*) and Isolation intolerance (*Isol, 8 items*).
4. *Impulsive Sensation-Seeking (ImpSS, 19 items))* items involve a lack of planning and the tendency to act impulsively without thinking and the seeking of excitement, novel experiences, and the willingness to take risks for these types of experiences. The ImpSS items are general in content and do not describe specific activities such as risky sports, drinking, drugs, or having sex. These items were eliminated to avoid confounding in studies of persons who actually engage in one or another of these activities. Two facet scores can be obtained from this scale: Impulsivity (*Imp, 8 items*) and Sensation Seeking (*SS, 11 items*).
5. *Aggression-Hostility (Agg-Host, 17 items)* items describe a readiness to express verbal aggression; rude, thoughtless or antisocial behaviour; vengefulness and spitefulness; having a quick temper and impatience with others.

The ZKPQ also includes an *Infrequency* scale (*Infreq, 10 items*). Rather than being regarded as a scale in the normative sense, it should only be used to detect inattention to the task or simply a validity measure for the individual test-taker. The items are mostly exaggerated, true scored, socially desirable but unlikely to be completely true statements about anyone. This scale is highly skewed, with most scores around 0 or 1.

Procedure

For the purpose of this study, subjects were contacted from very different sites (classroom, home, while waiting for a yearly health check, leisure associations, etc.) and asked to answer the questionnaire. The questionnaire was provided with written instructions and an introductory letter explaining globally the goal of the study («the study you will collaborate in attempts to evaluate the functioning of an American questionnaire in our culture»). Most of the questionnaires were administered in a group situation and others individually. In this latter situation, the subject also received a prepaid envelope which had to be posted. Around 90% of the respondents correctly completed the questionnaire. The ZKPQ was administered anonymously, and demographic variables such as age (5 age-ranges), gender and level of education (primary studies, secondary studies, higher education) were obtained. As the study was not intrusive in any way, neither informed consent waivers nor participants debriefing following participation were required. Subjects participated voluntarily in the study and did not receive any emolument for their collaboration.

Statistical analysis

Age and gender effects on scales and subscales were checked by means of an ANOVA. Bonferroni correction for multiple comparisons was not applied because multiple comparisons were not the primary goal of the study, but the behaviour of each single scale regarding age and gender. The effect of the variable «level of education» on the different scales and subscales of the ZKPQ was checked by means of subsequent ANOVAs. Partial correlation coefficients among ZKPQ scales controlling for age, gender and level of education, were used to assess the independence of the dimensions. Finally, an ANCOVA was performed including as principal effects age and gender, and the level of education as a covariant. With this statistical strategy we have a more adjusted estimation of the normative data. Means and standard deviations for both genders and by the 5 age-ranges were calculated for all the scales and subscales.

Results

The distribution of the sample by the 5 age-ranges and for both genders is shown in Table 1. The cut-off points for the 5 age-ranges were decided with the aim of obtaining a precise description of the variable age taking into account that the number of participants in each range would be sufficiently high to generate adequate estimations. In considering 5 age-ranges and 2 genders, 10 different conditions were generated with a sufficient number of subjects in each condition.

The distributions of the scores for the 6 scales are shown in Figures 1 to 6. The histograms illustrate that the scales show an

Table 1
Distribution of the sample by gender and age range

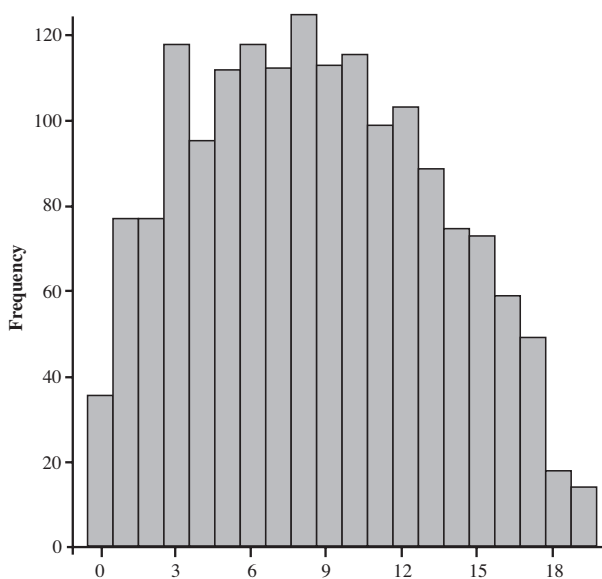| Age range	Men	Women	Total
18-25	178	325	503
26-40	216	228	442
41-55	188	192	380
56-70	77	92	169
71- 93	82	102	184
Total	741	937	1678

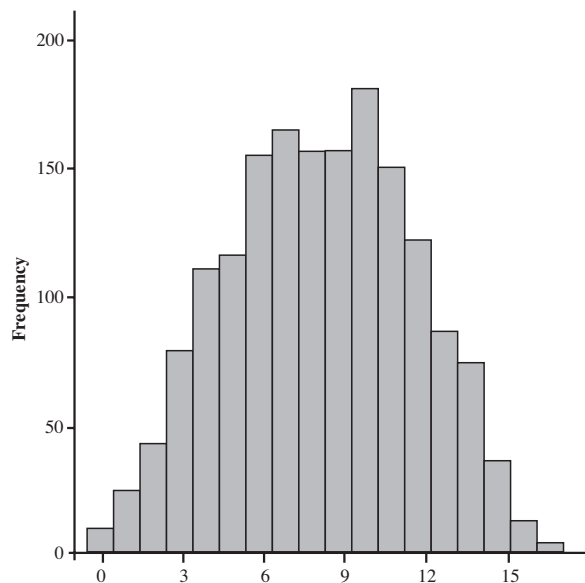**Figure 1**. *Histogram of the Neuroticism-Anxiety scale*

Figure 2. *Histogram of the Activity scale*

essentially normal distribution, except for the Infreq scale that shows a decreasing monotonic distribution.

In order to assess the effect of the variable age (5 categories) and gender in all the scales and subscales, we performed an ANOVA with these two factors (see Table 2). Both age and gender were significant in almost all conditions, except and only for the variable gender in the Act scale and its GenAct subscale, in the Parties subscale of the Sy scale, and in the Imp subscale of the ImpSS scale.

Also, in order to assess the effect of the variable level of education, subsequent ANOVAs revealed statistical significant differences among scales and subscales. Therefore, it seemed that this variable should be taken into account in the calculation of the normative data. Nevertheless, this variable has 3 categories, age has 5 categories and gender has 2 categories, giving in total 30 (3×5×2) categories. Thus, and because of the categorical nature of this variable, we have generated two dummy variables taking as a reference the category «primary studies». The first dummy variable was the contrast between the category «primary studies» vs «secondary studies». The second dummy variable generated was the contrast between the category «primary studies» vs «higher education». These dummy variables were also taken into account for the calculation of the correlation coefficients and the normative data. Table 3 shows ANOVAs for scales and subscales analysing the effect of level of education.

Table 4 shows the correlation matrix among the different scales of the ZKPQ. The correlation coefficients presented are partial correlations controlling for age, gender and level of education in order to obtain better adjusted estimations. As it can be observed, there exists a low level of covariation among the dimensions with correlations ranging from r= -.01 to r= .25, with an absolute mean interscale correlation of r= .14. These data show the independence of the dimensions although almost all of the correlations were significant due to the large sample size.

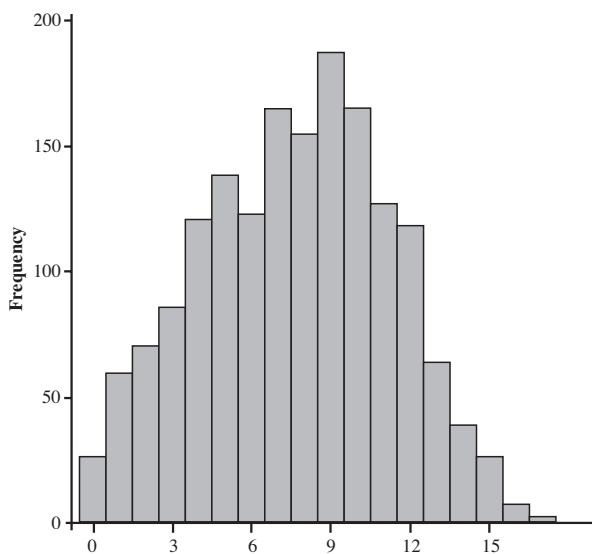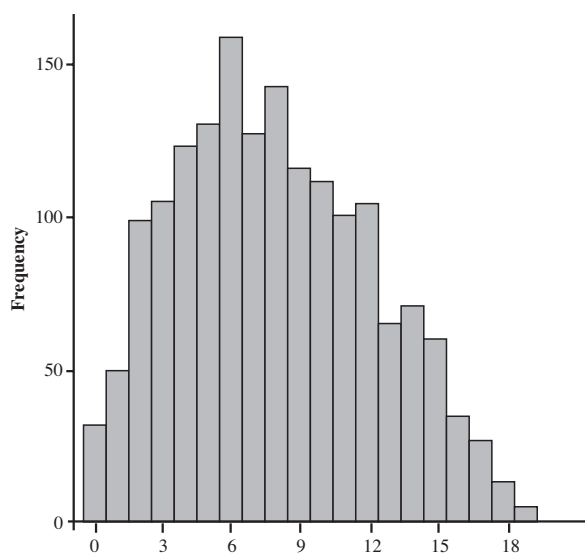*Figure 3. Histogram of the Sociability scale*

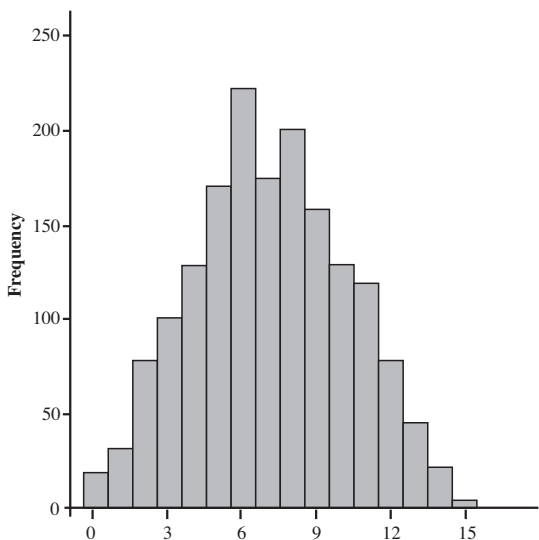*Figure 4. Histogram of the ImpulsiveSensationSeeking scale*

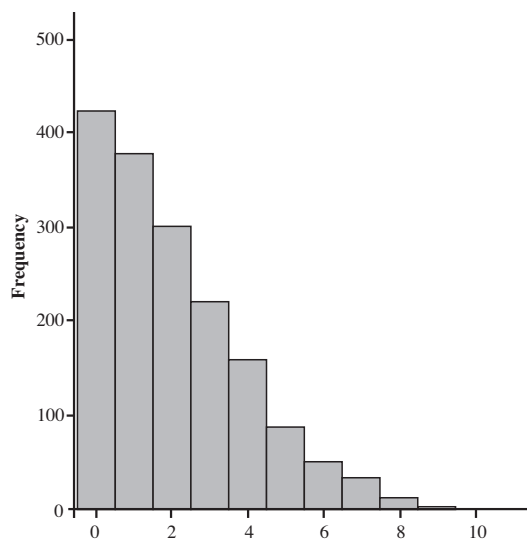*Figure 5. Histogram of the Aggression-Hostility scale*

Figure 6. Histogram of the Infrequency scale

Normative data by gender and age are presented in Table 5. The descriptive statistics shown are estimated due to the adjustment of the variable level of education. For each scale and subscale, we performed an ANCOVA taking as principal effects age and gender, and level of education (2 dummy variables) as a covariant. With this statistical strategy, normative means and standard deviations are more precisely estimated.

Discussion

The normative data obtained from a community sample of the general population showed a normal distribution of the scales. This implies that the items on each scale distribute the participants along the continuum on each dimension.

The pertinence of providing norms by gender is supported by the significant differences obtained in all but one scale (Act),

women scoring higher on N-Anx and Sy, and men higher on ImpSS, Agg-Host and Infreq. These results are in accordance with data obtained with instruments measuring similar personality traits, as the EPQ (Lynn & Martin, 1997) or the NEO-PI-R (Costa, Terracciano, & McCrae, 2001). The same applies for providing normative data by different age-ranges. Age was significantly different on all scales and subscales which imply that these dimensions may be influenced by subsequent biological and social factors. Nonetheless, the similarity with findings by Eysenck & Eysenck (1976) made 30 years ago suggests that the age related changes found are independent from potential cohort effects.

Finally, the fact of giving normative data adjusted by level of education is supported by the fact that all but one scale (ImpSS) show significant differences according to the level of education reached. This variable has been seldom considered in studies on normative data. We believe that this variable is worth considering in future publications of normative data because life expectancy is increasing and the older generations attained lower levels of education. Also, these results suggest that specific cross-cultural

Table 2
Two factors (age[1] and gender) ANOVAs for scales and subscales

Scale			F	p
ZKPQ				
N-Anx				
		Age	22.35	.0005
		Gender	121.43	.0005
Act				
		Age	6.88	.0005
		Gender	1.56	.212
	GenAct	Age	22.78	.0005
		Gender	2.48	.115
	WorkAct	Age	6.18	.0005
		Gender	23.42	.0005
Sy				
		Age	41.01	.0005
		Gender	10.44	.001
	Parties	Age	13.63	.0005
		Gender	1.57	.211
	Isol	Age	53.51	.0005
		Gender	16.19	.0005
ImpSS				
		Age	25.38	.0005
		Gender	4.31	.038
	Imp	Age	4.99	.001
		Gender	1.65	.199
	SS	Age	41.71	.0005
		Gender	17.25	.0005
Agg-Host				
		Age	22.69	.0005
		Gender	10.74	.001
Infreq				
		Age	134.90	.0005
		Gender	5.56	.018

Note: ZKPQ= Zuckerman-Kuhlman Personality Questionnaire; N-Anx= Neuroticism-Anxiety; Act= Activity; Sy= Sociability; ImpSS= Impulsive Sensation Seeking; Agg-Host= Aggression-Hostility; Infreq= Infrequency.
[1] The variable Age has 5 categories

Table 3
ANOVAs for scales and subscales analysing the effect of level of education

	F	p
ZKPQ		
N-Anx	20.21	.0005
Act	4.93	.007
GenAct	23.87	.0005
WorkAct	7.26	.001
Sy	22.77	.0005
Parties	3.37	.035
Isol	40.01	.0005
ImpSS	.78	.459
Imp	13.83	.0005
SS	8.81	.0005
Agg-Host	5.42	.005
Infreq	116.03	.0005

Note: ZKPQ= Zuckerman-Kuhlman Personality Questionnaire; N-Anx= Neuroticism-Anxiety; Act= Activity; Sy= Sociability; ImpSS= Impulsive Sensation Seeking; Agg-Host= Aggression-Hostility; Infreq= Infrequency

Table 4
Partial correlations among scales of the ZKPQ controlling for the effect of age, gender and level of education[1]

Scale	N-Anx	Act	Sy	ImpSS	Agg-Host
ZKPQ					
Act	-.009				
Sy	-.052*	.172**			
ImpSS	.157**	.239**	.239**		
Agg-Host	.217**	.097**	.100**	.253**	
Infreq	-.037	.208**	.135**	.153**	-.098**

Note: ZKPQ= Zuckerman-Kuhlman Personality Questionnaire; N-Anx= Neuroticism-Anxiety; Act= Activity; Sy= Sociability; ImpSS= Impulsive Sensation Seeking; Agg-Host= Aggression-Hostility; Infreq= Infrequency.
*p<.05, two-tailed; **p<.0005, two-tailed.
[1] The variable level of education has been considered by their 2 dummy variables

Table 5
Normative data by gender and age adjusted by level of education

Scale	Gender	Age ranges	Mean	SD
N-Anx	Men	18-25	8.47	4.46
		26-40	5.75	4.41
		41-55	6.02	4.39
		56-70	7.30	4.42
		71-93	8.07	4.54
	Women	18-25	10.44	4.78
		26-40	8.46	4.52
		41-55	9.47	4.45
		56-70	9.93	4.55
		71-93	10.31	4.77
Act	Men	18-25	8.03	3.55
		26-40	8.47	3.51
		41-55	8.59	3.50
		56-70	8.86	3.53
		71-93	9.40	3.61
	Women	18-25	7.78	3.80
		26-40	8.29	3.54
		41-55	7.76	3.54
		56-70	9.00	3.62
		71-93	9.16	3.80
GenAct	Men	18-25	3.83	2.47
		26-40	3.98	2.44
		41-55	4.24	2.43
		56-70	4.90	2.46
		71-93	5.47	2.51
	Women	18-25	3.93	2.65
		26-40	4.27	2.45
		41-55	4.44	2.47
		56-70	5.38	2.52
		71-93	5.30	2.65
WorkAct	Men	18-25	4.20	1.72
		26-40	4.49	1.70
		41-55	4.36	1.70
		56-70	3.96	1.71
		71-93	3.93	1.75
	Women	18-25	3.86	1.84
		26-40	4.02	1.71
		41-55	3.33	1.72
		56-70	3.62	1.76
		71-93	3.87	1.84
Sy	Men	18-25	8.61	3.47
		26-40	7.27	3.44
		41-55	6.29	3.42
		56-70	5.78	3.45
		71-93	7.52	3.53
	Women	18-25	9.32	3.73
		26-40	8.02	3.44
		41-55	6.33	3.47
		56-70	6.66	3.54
		71-93	7.97	3.72
Parties	Men	18-25	3.38	1.98
		26-40	2.97	1.95
		41-55	2.61	1.96
		56-70	2.49	1.97
		71-93	3.23	2.01
	Women	18-25	3.38	2.13
		26-40	3.06	1.97
		41-55	2.42	1.98
		56-70	2.79	2.01
		71-93	3.58	2.12

Table 5 (continuation)
Normative data by gender and age adjusted by level of education

Scale	Gender	Age ranges	Mean	SD
Isol	Men	18-25	5.23	2.17
		26-40	4.30	2.15
		41-55	3.68	2.13
		56-70	3.29	2.16
		71-93	4.29	2.21
	Women	18-25	5.93	2.33
		26-40	4.96	2.16
		41-55	3.91	2.18
		56-70	3.87	2.22
		71-93	4.38	2.32
ImpSS	Men	18-25	10.16	4.24
		26-40	8.60	4.20
		41-55	7.08	4.17
		56-70	6.12	4.21
		71-93	6.92	4.31
	Women	18-25	9.51	4.54
		26-40	7.72	4.21
		41-55	6.19	4.23
		56-70	6.18	4.33
		71-93	6.80	4.53
Imp	Men	18-25	3.55	2.13
		26-40	2.87	2.12
		41-55	2.61	2.11
		56-70	2.17	2.12
		71-93	2.70	2.17
	Women	18-25	3.36	2.29
		26-40	2.98	2.12
		41-55	2.57	2.14
		56-70	2.61	2.18
		71-93	3.09	2.28
SS	Men	18-25	6.67	2.85
		26-40	5.73	2.82
		41-55	4.47	2.80
		56-70	3.95	2.83
		71-93	4.21	2.90
	Women	18-25	6.16	3.06
		26-40	4.74	2.83
		41-55	3.61	2.85
		56-70	3.57	2.91
		71-93	3.70	3.05
Agg-Host	Men	18-25	8.15	3.06
		26-40	6.84	3.03
		41-55	6.92	3.01
		56-70	7.11	3.04
		71-93	6.22	3.12
	Women	18-25	8.48	3.28
		26-40	7.28	3.04
		41-55	6.36	3.06
		56-70	5.92	3.12
		71-93	4.51	3.27
Infreq	Men	18-25	1.51	1.65
		26-40	1.94	1.63
		41-55	2.27	1.63
		56-70	3.10	1.64
		71-93	3.90	1.58
	Women	18-25	1.08	1.77
		26-40	1.43	1.64
		41-55	1.88	1.65
		56-70	2.92	1.69
		71-93	4.16	1.77

Note: N-Anx= Neuroticism-Anxiety; Act= Activity; Sy= Sociability; ImpSS= Impulsive Sensation Seeking; Agg-Host= Aggression-Hostility; Infreq= Infrequency

normative data should be taken into account for the interpretation of non-clinical and clinical scores derived from translated versions of questionnaires.

This is the first time the normative data of the Spanish version of the ZKPQ in a general community sample is reported. The magnitude of the sample as well as an adequate representativity of both genders and the wide range of age being considered, gives a satisfactory description of each scale and subscales of this instrument.

We are confident that the availability of the norms as well as the psychometric properties of the ZKPQ will stimulate its use not only in normal populations but in clinical settings. Researchers and clinicians whose interest also includes general personality functioning as well as maladaptive personality traits might be well served by using this instrument as a useful adjunct for diagnosing, case conceptualization, differential treatment planning and predicting response to treatment.

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