

## Cattell's Personality Factor Questionnaire (CPFQ): Development and Preliminary Study<sup>1</sup>

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**Abstract:** This study was aimed at: (a) developing an instrument for personality assessment according to Cattell's model, in which the 16PF is based on; and (b) carrying out an empirical analysis of the internal structure of the instrument. Three hundred and forty seven people, mostly female (67.4%), attending higher education (62.5%) and aged between 16 and 66 ( $M = 25.69$ ;  $SD = 8.90$ ) participated in the study. One hundred and twenty items were created and an exploratory factor analysis of the main factors was carried out. Then, a parallel analysis, an exploratory full information factor analysis with categorical variables and an internal consistency analysis were performed. The results suggest that the instrument is composed of 12 factors of reasonable internal consistency rates. The model developed by Cattell helped to understand the structural organization found for the instrument, since there is coherency, especially in relation to more general terms (global factors).

**Keywords:** personality traits, personality measures, factor analysis

## Questionário Fatorial Cattell de Personalidade (QFCP): Construção e Estudo Preliminar

**Resumo:** Este estudo teve como objetivos: (a) construir um instrumento para avaliação da personalidade de acordo com o modelo de Cattell que dá base para o 16PF e (b) realizar uma análise empírica da estrutura interna desse instrumento. Participaram 347 pessoas, sendo a maioria do sexo feminino (67,4%), cursando o ensino superior (62,5%) e com idade variando de 16 a 66 anos ( $M = 25,69$ ;  $DP = 8,90$ ). Foram criados 120 itens e realizada uma análise exploratória de fatores principais. Posteriormente, uma análise paralela, uma análise fatorial exploratória por informação completa de variáveis categóricas e análise de consistência interna. Os resultados sugerem que o instrumento é formado por 12 fatores com índices de consistência interna razoáveis. O modelo construído por Cattell ajudou a entender a organização estrutural encontrada para o instrumento, uma vez que há coerência, principalmente em termos mais gerais (fatores globais).

**Palavras-chave:** traços de personalidade, medidas da personalidade, análise fatorial

## Cuestionario Fatorial Cattell de Personalidad (CFCP): Construcción y Estudio Preliminar

**Resumen:** Las finalidades de este estudio fueron: (a) crear un instrumento de evaluación de la personalidad según el modelo de Cattell que fundamenta el 16PF, y (b) realizar un análisis empírico de la estructura interna del instrumento. 347 personas participaron, en su mayoría mujeres (67,4%), cursando la educación superior (62,5%) y entre 16 y 66 años ( $M = 25,69$ ;  $DE = 8,90$ ). 120 puntos fueron creados y se realizó un análisis exploratorio de los factores principales, seguido de un análisis paralelo, un análisis factorial exploratorio para las variables categóricas con la información completa y análisis de la consistencia interna. Los resultados sugieren que el instrumento está formado por 12 factores de consistencia interna razonable. El modelo construido por Cattell ayudó a comprender la organización estructural que se encuentra en el instrumento, ya que hay coherencia, especialmente en términos más generales (factores globales).

**Palabras clave:** rasgos de personalidad, medidas de la personalidad, análisis factorial

Raymond Bernard Cattell (1905-1998) was one of the most important theorists in the area of personality. He is listed among the top greatest 20 psychologists of the twentieth century (Haggblom et al., 2002) and is considered one of the precursors of the current model of the Big Five Factor Model (FFM), which is proposed by some authors as

universal (McAdams, 2009; Nunes, Hutz, & Nunes, 2010). Horn (2000) stated that Cattell's personality theory can only be compared to Freud's theory, in terms of magnitude and scope, and to no other theory of empirical demonstration.

In Cattell's view, personality is the manner in which human beings behave in a certain situation. From this perspective, it is possible to infer personality traits based on a set of behaviors and, reciprocally, it is possible to predict how a person would behave in a certain situation by having information about their personality traits. In the 1940s, Cattell started a significant research that sought to identify the basic global factors of personality in a multivariate approach of traits

<sup>1</sup> Support: National Council for Scientific and Technological Development (CNPq), Coordination for the Improvement of Higher Education Personnel (CAPES), and São Paulo Research Foundation (FAPESP).

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or factors (Walter, 1995). Based on the famous list of adjectives of Allport's, Cattell reorganized it into 171 personality descriptors, which were used to describe the personality in empirical studies involving factor analysis (Cattell, 1943).

In empirical studies, he considered three kinds of basic data to capture personality dimensions: (a) responses to questionnaires, that is, the introspection of the individuals about their own behavior (Q-data); (b) third party reports based on observations about the individual everyday life behaviors (L-data); and (c) relatively straightforward measures of behavior controlled in a lab (Cattell, 1965; Cattell & Mead, 2008; Primi, 2010). Primary traits would be shown in the three situations. Therefore, in order to identify them, it would be necessary to observe the consistency of these three kinds of basic data. This perspective corresponds to the multi-method modern view of the psychological assessment, which consists of using several methods to better understand a behavior or psychological event.

Based on this view, Cattell (1957) identified 46 surface traits (a complete list is available in Cattell, 1957, p. 813), understood as the set of observed behaviors opposed to the source traits that would be the latent variables causing the surface traits. Later, with the students' help, the results were inter correlated and submitted to factor analysis, reaching 16 personality traits considered by Cattell as basic, found in the L and Q data (Cattell, 1965). These, in turn, gave rise to the instrument called Sixteen Personality Factor Questionnaire – 16PF (Cattell, Cattell, & Cattell, 1993). The personality traits assessed in the 16PF are fairly constant, and mood swings or situational changes in which individuals go through at some point in their lives are not assessed (Cattell, 1965). It is noteworthy that, in the first version, the 16PF was composed of five parallel versions (Cattell & Eber, 1954).

Each scale of the 16PF is bipolar and is called by the name of the positive pole. The factors are identified by a letter of the alphabet that indicates the order in which it was distinguished in the factor analysis, with the first letters indicating more important differences in the personality traits (Cattell, 1997). The letter Q indicates factors resulting only from Q data. According to Walter (1995), each one of the 16 factors corresponds to a stable personality trait, that is, a source trait.

The 16 global factors and their respective traits for low and high scores are described as follows: *A Warmth* (reserved, cool x outgoing, participating); *B Reasoning* (lower g x higher g); *C Emotional Stability* (Emotionally instable, affected by feelings, easily upset x Emotionally stable, adaptable, calm), *E Dominance* (deferential, docile, cooperative x assertive, dominant, independent); *F Liveliness* (taciturn, serious, introspective x carefree, cheerful, enthusiastic); *G Rule-Consciousness* (expedient, inconvenient x conscientious, conforming with cultural and conventional values); *H Social Boldness* (shy, timid x socially bold, venturesome); *I Sensitivity* (utilitarian, objective x sensitive, tender minded); *L Vigilance* (trusting, unsuspecting x skeptical,

vigilant); *M Abstractedness* (practical, grounded x abstract, absorbed in ideas); *N Privatness* (forthright, genuine x polished, private); *O Apprehension* (complacent, self-assured x apprehensive, indecisive); *Q1 Openness to Change* (conservative, traditional x experimental, open to change); *Q2 Self-Reliance* (group-oriented, affiliative x self-reliant, solitary); *Q3 Perfectionism* (undisciplined, tolerates disorder x controlling, perfectionist); *Q4 Tension* (calm, relaxed x tense, impulsive).

From the hierarchical analysis of the 16 factors, groups that gave rise to the first version of the five global factors were found, currently known as the Five Factor Model of Personality Traits (FFM) that is: extraversion, anxiety, tough mindedness, independence and self-control (Table 1), which would later be updated as extraversion, neuroticism, openness to experience (inverse correlation), agreeableness (inverse correlation) and consciousness, through reanalysis of Cattell's data by other researchers (Costa Jr. & McCrae, 2007).

Table 1  
Description of the Five Global Personality Factors of Raymond B. Cattell

Secondary Global Factors		
	I – Extraversion (x Introversion)	
A+ F+ H+ N- Q2-	Introvert Socially Inhibited	Extrovert Socially Bold
	II – Anxiety (x Stability)	
C- L+ O+ Q4+	Low Anxiety Emotionally stable	High Anxiety Emotionally reactive
	III – Tough Mindedness (x Openness)	
A- I- M- Q1-	Receptive Open Minded Intuitive	Inflexible Firm Low Empathy
	IV – Independence (x Accommodation)	
E+ H+ L+ Q1+	Accommodated Submissive Self-sacrificing	Independent Persuasive Focused on the future
	V – Self-control (x Lack of inhibition)	
F- G+ M- Q3+	Vigilant Impulsive	Controlled Inhibited

Table 1 shows the descriptors of the secondary five global factors. Taking into account the information presented in the table, there is a clear relationship with the FFM model. Currently, the most widely used instrument in the world based on this model is the Personality Inventory NEO-PI-R (Costa & McCrae, 1992). Some differences can be observed between this instrument and the 16PF. Cattell and Mead (2008) argue that the 16PF was developed through the *bottom up* methodology, that is, its primary factors empirically resulted from decades of research, which was not exactly the case of the six facets, in which each dimension of the NEO-PI-R is divided. Thus, the ingredients (primary factors) that constitute the five factors are different in the two tests. The authors point out three main differences: in the 16PF, the factor independence is similar to the dominance dimension

(or agency) in the interpersonal circumplex model (Alden, Wiggins, & Pincus, 1990). The second basic dimension of the interpersonal model, warmth (or affiliation, communion) is a primary scale of extraversion. The last difference is that the self-control factor in the 16PF is more comprehensive than consciousness (NEO-PI-R) in relation to the possible self-control strategies.

In addition, it is noteworthy that the personality test 16PF is a widely used instrument, with adaptation to more than 35 languages and broad research and information about its applicability in the workplace context (selection, promotion and career development, management training, groups work and leadership), clinical context (psycho diagnosis, couple therapy) and educational context (professional guidance) (Cattell & Mead, 2008). However, its fifth edition in Brazil has not been approved yet for professional use, according to the Psychological Tests Assessment System (SATEPSI) (<http://www2.pol.org.br/satepsi>) due to problems in its manual in the presentation of Brazilian studies. So, and coupled with the growing interest of Psychology in the development of new psychological assessment instruments, the present study was aimed at: (a) developing an instrument for personality assessment according to Cattell's model, in which the 16PF is based on; and (b) carrying out an empirical analysis of the internal structure of the instrument. Therefore, a new instrument was developed in order to assess the constructs defined by Cattell. Concomitantly, it was sought to show information about this theoretical method and its relationship with the more modern theories, such as the FFM. Therefore, this study shows the steps for the development and an initial study of the internal structure of the items created.

## Method

### Participants

Three hundred and forty seven people participated in this study, most of them being female (67.4%), single (72.1%), and they were undertaking a higher education course (62.5%). The age of the participants ranged from 14 to 66, with an average of 25.69 years ( $SD = 8.90$ ), 5.6% being between 14 and 16, 7.6% between 16 and 18, 43.3% between 19 and 24, 23.7% between 25 and 30 and 19.9% over 31. Concerning educational level, 12.2% are high school students, 61.2% are undertaking higher education and 26.6% have completed higher education. Most of the university students were from Psychology (31.3%), Education (16.1%), Architecture (6.1%), and Civil Engineering (5.8%) courses. Among the higher education courses completed by the graduated professionals were Computer Engineering (7%) and Administration (4.3%).

From the total sample, 265 subjects (76.4%) provided complete answers to the identification questionnaire, making it possible to establish the socioeconomic classification according to the Brazilian Economic Classification Criteria

(CCEB) of the Brazilian Association of Research Companies ([www.abep.org](http://www.abep.org)), which was then divided by classes (and average monthly income in brackets), as follows: 2.6% A1 (R\$ 12,926), 10.6% A2 (R\$ 8,418), 18.5% B1 (R\$ 4,418), 34% B2 (R\$ 2,565), 22.6% C1 (R\$ 1,541), 8.7% C2 (R\$ 1,024), and 3% D (R\$ 714). In general, the sample is composed of university students and professionals who have completed higher education, that is, young adults. There is a relative diversity of graduation areas and also a small portion of teenagers. It can be highlighted that this sample was composed of the combination of five studies (three undergraduate course completion assignments, one master's and the other, Ph.D.) and, therefore, there is a relative diversity in relation to the origin of the people involved.

### Instrument

Initially, for the development of the items, the definitions of the primary factors of the 16PF questionnaire were reviewed (Cattell & Eber, 1954; Cattell, Eber, & Tatsuoka, 1970; Cattell et al., 1993). An exploratory factor analysis of the 16PF items, fifth edition, was carried out based on databases of previous researches undertaken by the Psychological and Educational Assessment Laboratory (LabAPE) (<http://www.labape.com.br>; Primi, Bueno, & Muniz, 2006; Primi et al., 2002). These results were used to qualitatively examine the content of the items with higher internal validity, that is, those that had high scores in their originating factor. Based on the definition and operationalization of the construct, the first and the last authors of this research developed 377 new items for 15 factors (the factor B, reasoning, was removed, due to the fact that it is factor with contents less related to the personality). These items were distributed as follows: Warmth (A = 16 items), Emotional Stability (C = 16 items), Dominance (E = 24 items), Liveliness (F = 21 items), Rule-Consciousness (G = 30 items), Social Boldness (H = 20 items), Sensitivity (I = 37 items), Vigilance (L = 26 items), Abstractedness (M = 28 items), Privateness (N = 29 items), Apprehension (O = 26 items), Openness to Change (Q1 = 28 items), Self-Reliance (Q2 = 24 items), Perfectionism (Q3 = 26 items) and Tension (Q4 = 18 items).

Then, the two researchers analyzed the items independently and indicated the best items that should compose the 15 scales of the test, taking into account the representation of the construct and readability criteria. After that, they compared the choices in order to select eight items for the scale that had received positive indications by the two researchers, independently. Then, in the end, an initial booklet, which was the object of this study, was prepared with 120 items (8 X 15). For each item, a scale of four point answers was added (1 = *nothing to do with me*, 2 = *a little to do with me*, 3 = *a lot to do with me* and 4 = *very similar to me*), based on previous studies about scale optimization (Nunes et al., 2008) and a sheet with personal data. The instrument was called Cattell's Personality Factor Questionnaire (Primi & Carvalho, 2008).

## Procedure

**Data collection.** The participants individually answered the instrument, but mainly in collective situation (classrooms and companies). The researchers explained in detail how to answer and fill out the answer sheet of the instruments, making it clear that the participants should choose the answer that better represented their behavior.

**Data analysis.** The objective of this study was to verify the internal structure of the items based on the covariance/inter-items correlation matrix. The most demanding initial hypothesis was that the items would be organized into 15 groups according to Cattell's model. A second hypothesis, which was relatively less demanding, was that the items would be organized according to the five global secondary factors. Thus, the coherence between the empirical structure and the hypothesized by the theoretical model would be a positive evidence of validity of the instrument's internal structure.

The analyses were carried out using two methods. Firstly, through the Statistical Package for the Social Sciences (SPSS) version 19, an exploratory analysis of the main factors was performed based on the correlation matrix, followed by an oblique rotation procedure (oblimin). To decide on the number of factors, the parallel analysis was used by simulating 1000 correlation matrices among 120 random variables using the program *RanEigen* for SPSS (Enzmann, 1997). The average of the *eigenvalues* extracted from the 1000 replications was considered the minimum values that the empirical *eigenvalue* should reach in order to be extracted as potentially relevant. The procedure of the Psych package in R was also used, which performs parallel analyses based on polychoric correlation matrices (Revelle, 2012).

The literature has suggested that the most appropriate method for the factor analysis of dichotomous and polytomous items is the factor analysis by complete information using TRI models for categorical variables (Primi, Silva, Santana, Muniz, & Almeida, 2013). According to this recommendation, a full information exploratory factor analysis of categorical variables was also carried out in the program *Mplus* (Muthén & Muthén, 2010). The estimator *Weighted Least Squares Mean and Variance-Adjusted* (WLSMV) was used which, according to Léon (2011), is one of the best ways of working with categorical data modeling. The analysis was followed by oblique rotation GEOMIN.

One advantage of using *Mplus* is that it provides classical fit index of the confirmatory factor analysis. Therefore, several models were extracted (5 to 13 factors) and, in each analysis, the fit indexes of adjustment were recovered, allowing verification of the several models' fit. The  $\chi^2$  (chi-square), the ratio  $\chi^2/g.l.$ , the *Comparative Fit Index* (CFI), the *Tucker-Lewis Index* (TLI) and the *Root-Mean-Square Error of Approximation* (RMSEA) were analyzed. However, it must be taken into consideration that personality is a complex and hierarchically organized construct (Wright et al., 2012). As a result of this and the use of items as indicators, the factor

analyses usually do not reach the acceptable recommended levels for traditional analyses in relation to a confirmatory factor analysis with continuous variables (Hopwood & Donnellan, 2010). It should be noted that, in this study, only exploratory factor analysis method was carried out, but the program *Mplus* estimates fit indexes of the confirmatory analysis. Therefore, the fit indexes were considered in a relative manner, in conjunction with the parallel analysis, in order to inform the decision about the number of factors.

Another advantage of the program *Mplus* is the estimation of standard errors for the factor loadings in the GEOMIM rotation. Thus, having these, three criteria to select items for the factors were used: (a) the item should be theoretically coherent with the factor; (b) it should have initially a factor loading over .30; however, due to some of the factors having had few items following this criterion and since this is an initial study, the loadings up to .20 were considered; and (c) the factor loading should be significant. After the extraction of factors and selection of the items, their contents were examined in order to develop interpretations of the extracted factors. The internal consistency analysis of the scales obtained was also carried out.

## Ethical Considerations

The database of this study combines three undergraduate course completion research assignments, one master's degree and one Ph.D. involving the relationship between personality and external variables. These projects were examined and approved by the Research Ethics Committee of the Universidade São Francisco. Throughout the research process, the ethical principles related to research involving human beings were followed, according to Resolution 196/96 of the Ministry of Health.

## Results

To achieve the objectives of this study, which involved the development of a personality assessment instrument according to the 16PF model and analyze its internal structure, a good sample adequacy for the analysis of the Kaiser-Meyer-Olkin coefficient ( $KMO = .71$ ) was initially verified, as well as Bartlett's sphericity test [ $\chi^2(7140) = 15.821.30; p \leq .01$ ], which indicated that the correlation between the items are sufficiently good to carry out the factor analysis. The results of the extraction of the main factors of the exploratory factor analysis of the instrument's 120 items are shown in Figure 1. It can be noted through the *scree plot* that the first six factors are well differentiated and from the twelfth onwards there is no differentiation between them. It can also be noted that the two extraction methods, the *principal axis factoring* (PAF) and the WLSMV, were very similar. The criterion resulting from the parallel analysis through Psych indicated the extraction of 12 factors. Therefore, in the *RanEigen*, the extraction with 12 factors explains 36.3% of the variance with minimum *eigenvalue* of 1.34.

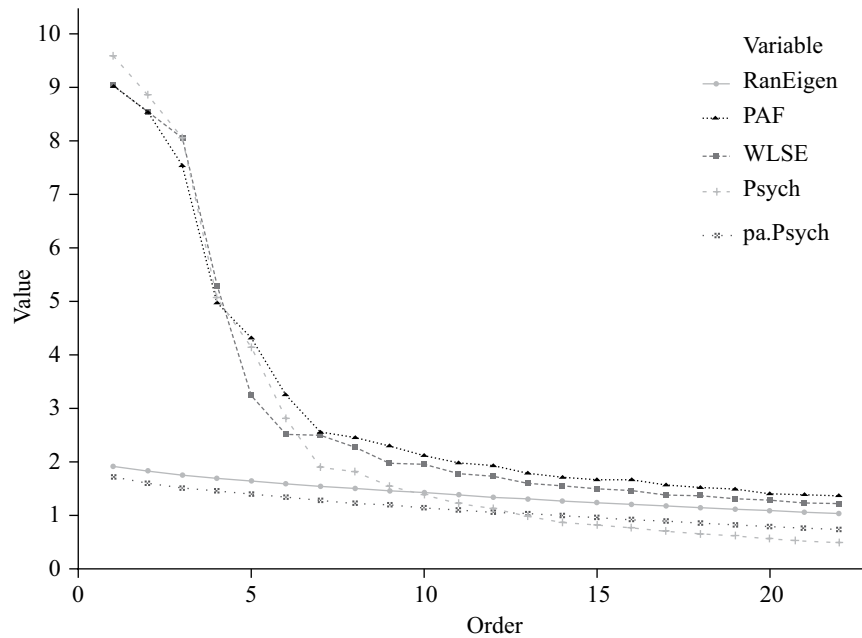


Figure 1. View of the eigenvalues of the factors extracted from the factor analysis.

Based on the data presented, through the program *Mplus*, the extraction of five to 13 factors was required. The fit indexes of the models are shown in Table 2. Taking into account the traditional criteria, the fit indexes  $\chi^2/df$  and RMSEA were shown to be adequate for all the models ( $< 2$  e  $< .05$  respectively) (Schweizer, 2010). The CFI and TLI indexes were below the requirement of .95. However, it is possible to note that, the indexes increase from five to 12 factors, indicating progressively higher fits. From 12 to 13 factors, however, the CFI hardly increases. Based on this pattern, the parallel analysis and also the initial stage in which the study with the CPFQ currently is, the solution of 12 factors was chosen.

It can be seen in Table 3 that the number of items per factor ranged from 5 to 15 and the factor loadings average ranged from .32 to .48, and each factor was composed of the items that better represented the construct related to them. From the 114 items that remained after the factor analysis, 15 items had factor loadings below .30, three

items being in factor 1 (items 39, 69, 114), three items in factor 5 (105, 63, 75), one item in factor 6 (28), one item in factor 7 (100), two items in factor 8 (4, 92), one item in factor 9 (50), three items in factor 11 (113, 7, 2) and, at last, one item in factor 12 (32). Thus, to avoid a large reduction in the number of items in some factors, it was decided to keep them. The internal consistency (alpha coefficient) of each CPFQ factors was also evaluated and, in general, the scores were reasonable. The factors 4 and 11, however, need attention, given that they had low alpha coefficient, that is, below .60.

Table 4 is a way of clarifying and showing the corresponding features among the CPFQ, the 16PF and the BFF factors. In the first column are the 12 factors extracted from the CPFQ; in the second and third columns, the description of the features of each factor for low and high scores in the CPFQ. The fourth column has the primary factors of the 16PF (positive or negative pole) and the last column corresponds to the Big Five factors.

Table 2  
*Comparison Among the Fit Quality Indexes of the Several Models Tested*

Models	$\chi^2$ (gl)	$\chi^2/df$	CFI	TLI	RMSEA
5 factors	7601.093 (6550)	1.61	.783	.763	.022
6 factors	7292.028 (6435)	1.14	.823	.804	.020
7 factors	7095.988 (6321)	1.13	.840	.819	.019
8 factors	6906.302 (6208)	1.12	.856	.834	.018
9 factors	6737.903 (6096)	1.11	.867	.845	.018
10 factors	6572.227 (5985)	1.10	.879	.855	.017
11 factors	6423.690 (5875)	1.10	.887	.862	.017
12 factors	6279.889 (5766)	1.09	.894	.869	.016
13 factors	6150.717 (5658)	1.09	.898	.872	.016

Table 3  
Solution Factors, Factor Loadings and Cronbach's Alpha Scores

Factor	Alpha	M	SD	Number of Items	Minimum	Maximum
1	.85	.48	.12	13	.32	.66
2	.69	.36	.13	8	.20	.51
3	.73	.45	.10	7	.33	.61
4	.47	.32	.07	8	.23	.44
5	.70	.43	.17	8	.27	.69
6	.74	.43	.12	9	.24	.59
7	.74	.36	.07	15	.23	.50
8	.74	.42	.12	11	.22	.58
9	.77	.41	.07	12	.28	.52
10	.63	.41	.07	5	.33	.50
11	.44	.33	.08	6	.22	.46
12	.73	.42	.10	12	.20	.56

### Discussion

This study showed that creating items and trying to replicate the structure found by Cattell is not an easy task, given that the culture is different from that in which the model was developed, as well as the procedures (item-factor analysis) and statistical software currently available for analysis significantly differ from the methods used by Cattell, which supported him to develop the structure proposed for the 16PF. The issue about the development of personality instrument in different cultures and the analytical procedures used is a broad topic in the literature (Hopwood & Donnellan, 2010; McAdams, 2009). Generally (Table 4), based on Cattell (1965) and Cattell et al. (1993), the results show that, from the 12 factors of the CPFQ, six (1, 6, 7, 8, 10 and 12) are composed of more than one corresponding primary scale in the 16PF, which were grouped and formed global factors. The factors 4, 9 and 11 were also formed by grouping

more than one primary trait. However, *a priori*, they do not match the definition of the global factors proposed by Cattell (Cattell & Mead, 2008). Finally, the factors 2, 3 and 5 are characterized by primary factors, that is, they are formed only by a primary source traits. Therefore, of the 12 factors found, nine are coherent to Cattell's model, either in relation to the primary level of the 16 factors or the wider level of the five factors.

Specifically, it was noted that the Extraversion, Openness and Agreeableness of the FFM model (Costa Jr. & McCrae, 2007) are represented in the developed instrument in the positive and negative poles (Table 4). But the Neuroticism and Consciousness factors are expressively more represented in the negative and positive poles respectively. In this sense, the development of items for the poles not represented by these factors is suggested. Still, the representation of the typical factors of the FFM model is evident in the test presently developed and have direct relationships with the dimensions proposed by Cattell (Cattell & Mead, 2008).

Table 4  
Description and Consistency Between the Factors of the CPFQ, the 16 PF and the FFM

CPFQ	CPFQ Factors Names	Low Scores	High Scores	16 PF	FFM
F1	Social Boldness	Socially bold, venturesome	Shy, timid	H-, A-	E-
F2	Abstractedness	Practical, careful	Abstract, intuitive	M+	O+
F3	Dominance	Submissive, genuine	Dominant, assertive	E+	A-
F4	Apprehension	Self-assured, carefree	Conscientious, follows cultural values	G+, O+, L-, H-	C+
F5	Low Emotional Tension	Tense, impatient	Patient, calm	Q4-	N-
F6	Adherence to groups	Individualist, self-reliant	Adherent to groups, group oriented	Q2-, F+	E+
F7	Practicality	Emotionally instable, sensitive	Practical, objective	I-, M-, N+	O-
F8	Order/Organization	Tolerates disorder, relaxed	Perfectionist, organized	Q3+, O+, F-	C+
F9	Consciousness/Morality	Likes trying new things, liberal	Tends to follow rules and conventional cultural values	Q1-, G+	C+
F10	Dominance	Submissive, cooperative	Dominant, assertive	E+, L+	A-
F11	Vigilance	Distrustful, vigilant	Trustful, naïve	L-, N-	A+
F12	Emotional Stability	Apprehensive, tense	Confident, carefree	O-, Q4, C+	N-

In general, all the extracted factors can be covered by the big five global factors, which provide a meta organizational framework for the primary factors of the 16PF. It is important to emphasize that the factors 1, 6, 7, 8, 10 and 12, although having combined items designed to measure different primary factors, these primary factors are those grouped to form the global factors. Therefore, in this broader level, the extracted factors are consistent with the model (Cattell & Mead, 2008). There are two factors connected to the construct *extraversion* (factors 1 and 6). Factor 1, *Social Boldness*, relates to how subjects presents themselves socially, which can be either in a uninhibited and outgoing manner or reserved and shy and has the following item as example “I often start talking to people I don’t know” and factor 6, *Adherence to Groups*, corresponds to the way people relate to others, in a more individualistic way or more dependent on social/group contact (example of the item: “I always try to do my work in group”). Factor 7, named *Practicability*, relates to the way people deal with their actions, that is, in a more sentimental, genuine and authentic way or more objective, realistic, practical and discreet manner. An example of a characteristic item in this factor is: “People say I am more rational in personal relationships”. This factor combines components of the broad factor Openness.

Factor 8, *Order/Organization (self)*, is represented by the global factor consciousness, organization, self-discipline, concern and care when performing tasks. On the opposite pole, it indicates how much subjects are able to tolerate disorder and make unplanned decisions. An example of item in factor 8 is: “My personal objects are always in perfect order”. Factor 10, *Dominance*, relates to the way in which subjects are presented in relationships, either in a submissive way, willing to avoid conflicts or dominant, assertive, alert. An example of item in this factor is: “I can be rude and direct when necessary”. This factor is associated to the global factor Agreeableness (negative pole). Finally, factor 12, as the name implies, relates to the subjects’ *Emotional Stability*, and a low score in this factor represents people with greater guilt, tension, impatience, indecision, emotionally unstable and those subjects with a high score are more confident, carefree, complacent and emotionally stable. An example of this item is: “Sometimes I feel guilty even when I know I am right”. This factor is associated with Neuroticism. Although not all factors proposed by Cattell have been found, the author’s model supported the understanding about the structural organization found in the CPFQ, especially considering that the grouping of the evidenced items is coherent, mainly in more general terms (global factors).

Some factors (4, 9, 11) of the CPFQ are also composed of the grouping of more than one trait. However, they do not relate directly to the factors found by Cattell (1965) and Cattell et al. (1993), at least based on the original denomination of the items when they were created. Factor 4, *Apprehension*, is represented by characteristics related to subject’s level of concern, also involving to follow or not cultural values and has as an item example “If a person can break the rules for personal gain without being discovered, they should break them”.

Thus, people with a high score in this factor tend not to allow themselves to break rules, express difficulty in taking initiative and have a more passive attitude. In contrast, people with a low score in this factor tend to believe they need to break the rules in order to get things and deal well with this because they have little concern and actively seek to achieve their objectives.

Factor 9, *Consciousness/moralism*, relates to people’s inclination to be more liberal and try new things or to follow rules and social values, an example of the item being: “I am more liberal and like experiencing new things”, thus showing openness to new experiences. Also, factor 11, *Vigilance*, is related to people’s ability to trust other people, ranging from distrust to naivety, as shown in the following item example “In general, I tend to trust people”. Thus, it can be noted through the theoretical analysis of the items of factors 4, 9 and 11 that there is an emphasis on one of the primary factors, which are coherent with the 16PF proposal at the global level (Cattell & Mead, 2008).

Concerning the three factors of the CPFQ, which grouped items from only one primary factor of the 16PF, factor 2 called *Abstractedness*, presented items related to how people deal with their thoughts (for example: “I often ‘daydream’”). Factor 3, *Dominance*, shows the way in which people tend to relate to others (for example: “In relation to team work, I tend to be more questioning, critical”). And, factor 5, *Low Emotional Tension*, relates to the way in which people deal with tension and anxiety, having as example the following item “I am patient with people, even when they are rude”.

## Final Considerations

This study was aimed at developing an instrument based on Cattell’s model and verifying its internal structure. Thus, this research had an exploratory nature and, based on the findings, it can be concluded that, although the 15 primary factors of Cattell’s model have not been individually found, the 12 factors extracted from the CPFQ are coherent with the researcher’s proposal. The primary scales appeared but most of them were grouped, forming more general factors in line with the theory. Thus, the CPFQ is an instrument that covers more general aspects of the personality. It can also be highlighted that there are no studies that have managed to create an instrument with the same 16 factors proposed by Cattell.

The main limitation of this study relates to the sample size and the age of the participants, mostly consisting of young adults, which can limit the appearance of sufficient variability in personality traits. New researches with the instrument are required to expand and diversify the samples. Therefore, the development of studies aimed at verifying the reapplication of the factor structure found in this study is suggested, these being validity studies with external variables, using both the CPFQ and the 16PF simultaneously. As a contribution, there is the importance of developing an instrument of personality assessment supported by one of the most well-known theories in the area of personality assessment and appropriate to the Brazilian context.

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*Received:* Dec. 13<sup>th</sup>, 2012

*1<sup>st</sup> Revision:* Aug. 30<sup>th</sup>, 2013

*2<sup>nd</sup> Revision:* Set. 10<sup>th</sup>, 2013

*3<sup>rd</sup> Revision:* Oct. 14<sup>th</sup>, 2013

*Approved:* Oct. 21<sup>st</sup>, 2013

*How to cite this article:*

Primi, R., Ferreira-Rodrigues, C. F., & Carvalho, L. F. (2014). Cattell Personality Factors Questionnaire (CPFQ): Construction and preliminary study. *Paidéia (Ribeirão Preto)*, 24(57), 29-37. doi:10.1590/1982-43272457201405

