

# Relationship between the Five-Factor Model of personality and empathy using the Pictorial Empathy Test

## Abstract

*Empathy has two main forms, cognitive and affective, empathy. The first one would be the identification of the mental states of another person and, the second one, the ability to share emotions and experience personal discomfort when you see the suffering of others, as well as giving an appropriate response. Traditionally, empathy has been measured using questionnaires. However, barriers such as language make it necessary to develop new tools using the universality of images. The aim of the present study was to validate the Pictorial Empathy Test (PET) of Lindeman et al. and its relationship with personality in samples of Spanish and Argentinean adults. The PET consists of seven photographs of distressed people. To explore convergent validity we used the Empathy Quotient (EQ). For criterion validity we used The Big Five Personality Trait Short Questionnaire (BFPTSQ). The sample consisted of 236 participants, of which 78 were born in Spain (38 men and 40 women) and 158 in Argentina (53 men and 105 women). The results indicated that the PET score correlated with EQ in both countries, the highest mean PET score being found in the Spanish sample. No significant differences were found between men and women, although the effect sizes were between small and medium. The dimensions of personality that were significantly related in both countries with the PET scores were agreeableness and openness. Despite the fact that we were not able to replicate the significant gender differences expected, and found in the original study, the scale presented satisfactory indices of reliability and validity in both countries. Taking into account the results obtained, we consider that the PET could be an adequate alternative to traditional questionnaires to measure empathy.*

## Resumen

*Autores concuerdan en que la empatía posee dos formas posibles, la empatía cognitiva y la empatía afectiva, definen la primera como la identificación de los estados mentales de otra persona y la segunda como la capacidad de compartir emociones y experimentar malestar personal al presenciar el sufrimiento de otros, así como dar una respuesta apropiada. Tradicionalmente esta se ha medido usando cuestionarios, sin embargo barreras como el idioma hacen necesario el desarrollo de nuevas herramientas usando la universalidad de la imagen. El objetivo de la presente investigación fue el de validar el Pictorial Empathy Test (PET), escala desarrollada por Lindeman et al. (2018), que consta de siete fotografías de personas afligidas, en muestras de adultos españoles y argentinos explorando su asociación con otra medida de empatía como lo es el Empathy Quotient (EQ) y con las dimensiones de personalidad utilizando The Big Five Personality Trait Short Questionnaire (BFPTSQ). Los datos se obtuvieron de un total de 236 adultos, de los cuales 78 eran nacidos en España (38 hombres y 40 mujeres) y 158 en Argentina (53 hombres y 105 mujeres). Los resultados indicaron que la puntuación PET correlaciona con EQ en ambos países, puntuando más alto la muestra española que la muestra argentina y no encontrándose diferencias significativas entre hombres y mujeres. Las dimensiones de la personalidad que se relacionan significativamente en ambos países con las puntuaciones de PET, fueron la amabilidad y la apertura a la experiencia. A pesar de que no hemos podido replicar las diferencias de género esperadas y encontradas en el estudio original (Lindeman et al., 2018), la escala presentaba índices satisfactorios de fiabilidad y de validez en ambos países, por lo que consideramos que el PET puede ser una alternativa adecuada a los cuestionarios tradicionales para medir la empatía.*

# Relationship between the Five-Factor Model of personality and empathy using the Pictorial Empathy Test

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## Introduction

Baron-Cohen and Wheelwright (2004) distinguish two forms of empathy, cognitive empathy and affective empathy. They define the first one as the identification of the mental states of another person. The second one would be the ability to share emotions and experience personal discomfort when witnessing the suffering of others, as well as giving an appropriate response.

Taking into account this differentiation, we could ask ourselves, what factors are involved in the ability to feel empathy, both affective and cognitive? Previous studies (Melchers et al., 2016; Nettle, 2007) have addressed this question by correlating empathy with personality traits from the Five-Factor Model (McCrae and Costa, 2010). It has been found that agreeableness and conscientiousness would be the best predictors of empathy. In addition, cultural and gender factors have been considered, finding only some cross-cultural differences and higher scores in women (Melchers et al., 2016).

The most used tools to assess empathy are questionnaires. One of the most used is the Empathy Quotient (EQ), created by Baron-Cohen and Wheelwright (2004). Given that, many times, the exclusive use of questionnaires presents limitations related to length, time and language differences, Lindeman et al. (2018) developed the Pictorial Empathy Test (PET). The PET consists of seven photographs of distressed people. Two of the photographs are of women, two of men, two of children and one which shows a baby whose gender was not identifiable.



The aim of the present research was to validate the PET in samples of Spanish and Argentinean adults and explore its relationship with the five factors of personality.

Our hypotheses were: (1) PET scores would correlate significantly with the EQ scale in both Spain and Argentina; (2) women would score higher than men in the PET in both countries; (3) agreeableness and conscientiousness would be the dimensions most related to the PET scores in the two cultures; and (4) we did not expect to find significant differences in the total average PET scores between both countries.

## Method

### Participants

The participants were 236 adults, 78 of them were born in Spain (38 men and 40 women) and 158 in Argentina (53 men and 105 women). The average age of the entire sample was 35.5 years (SD = 10.69). The majority (70.3%) had tertiary education. The majority of participants (75%) indicated that they were working.

### Measures

The Spanish version of The Big Five Personality Trait Short Questionnaire (BFPTSQ, Ortet et al., 2017), the Pictorial Empathy Test (PET, Lindeman et al., 2016) and the Spanish version of the Empathy Quotient (EQ; Redondo & Herrero-Fernández, 2018).

### Procedure

The data was collected through online questionnaires using Qualtrics. Participation was voluntary and anonymous.



## Results

A principal axis factoring analysis of PET was performed. It was found that the main factor explained 61.20% of the variance for the Spanish sample and 60.39 for the Argentinean sample. The factor loadings for the seven photographs ranged from .52 to .83 in Spain and from .65 to .84 in Argentina

Table 2. Descriptives by Gender and Country: Mean, Standard Deviations and Correlations between the Two Countries

Scale	Spain		Argentina		r	p
	Mean (SD)	Standard (SD)	Mean (SD)	Standard (SD)		
PET	2.88 (.74)	0.94 (.71)	3.1	0.78 (.82)	0.84 (.84)	<.001
EQ	27.87 (4.38)	4.98 (3.74)	27.28	4.28 (3.94)	0.67 (3.81)	<.001
Emotional reactivity	14.46 (3.28)	2.68 (2.48)	13.89	1.76 (2.27)	14.86 (2.82)	<.001
Cognitive empathy	13.74 (2.78)	1.83 (2.04)	13.4	1.71 (2.05)	13.35 (2.28)	<.001
Total score	18.74 (2.78)	1.83 (2.04)	13.4	1.71 (2.05)	13.35 (2.28)	<.001
Female score	30.24 (3.22)	4.48 (3.22)	27.89	3.48 (3.48)	27.42 (3.74)	<.001

Note. EQ: Empathy Quotient; PET: Pictorial Empathy Test. All correlations are significant at the .001 level.

Table 1. Means and Standard Deviations for Personality Dimensions and Empathy Scores and Mean Correlations between Countries

Scale	Spain		Argentina		r	p
	Mean (SD)	Standard (SD)	Mean (SD)	Standard (SD)		
PET	2.88 (.74)	0.94 (.71)	3.1	0.78 (.82)	0.84 (.84)	<.001
EQ	27.87 (4.38)	4.98 (3.74)	27.28	4.28 (3.94)	0.67 (3.81)	<.001
Cognitive empathy	13.74 (2.78)	1.83 (2.04)	13.4	1.71 (2.05)	13.35 (2.28)	<.001
Emotional reactivity	14.46 (3.28)	2.68 (2.48)	13.89	1.76 (2.27)	14.86 (2.82)	<.001
Female score	18.74 (2.78)	1.83 (2.04)	13.4	1.71 (2.05)	13.35 (2.28)	<.001
Male score	30.24 (3.22)	4.48 (3.22)	27.89	3.48 (3.48)	27.42 (3.74)	<.001

Note. EQ: Empathy Quotient; PET: Pictorial Empathy Test. All correlations are significant at the .001 level.

Table 3. Pearson Correlations of selected PET scales and the scores of other variables (variables in the table)

Variable	Spain		Argentina	
	r	p	r	p
Full Empathy Quotient scale	.67**	<.001	.67**	<.001
Emotional Reactivity	.67**	<.001	.67**	<.001
Cognitive Empathy	.67**	<.001	.67**	<.001
Female Score	.67**	<.001	.67**	<.001
BFPTSQ Dimensions				
Conscientiousness	.28*	<.05	.28*	<.05
Agreeableness	.35**	<.01	.35**	<.01
Openness	.24*	<.05	.24*	<.05
Neuroticism	.12	>.05	.12	>.05

Note. EQ: Empathy Quotient; PET: Pictorial Empathy Test. All correlations are significant at the .001 level.

## Discussion

The total PET score correlated with EQ in both countries, especially the emotional reactivity subscale, replicating the findings of Lindeman et al. (2018) and indicating an adequate convergent validity of the scale. Therefore, the first of our hypotheses was confirmed.

Our second hypothesis was that women would score higher than men in the PET in both countries. Our findings in both countries indicated that this hypothesis was not confirmed, contrary to what was found in the original study of the scale (Lindeman et al., 2018). All in all, the effect sizes were small (Spain) and between small and medium (Argentina). It could be that our results were polarized, both in men and women, because the scale only uses negative stimuli. The EQ also includes positive aspects of empathy.

The correlations between the PET scores and the BFPTSQ dimensions indicated that the third hypothesis was partially fulfilled. Thus, agreeableness was the dimension with the higher association with empathy in both countries, showing satisfactory criterion validity. However, conscientiousness was not related to empathy and openness was also associated with the PET scores. Melchers et al. (2016) indicate that openness is another relevant dimension for empathy. Finally, our fourth hypothesis was not confirmed, since the PET score in Spain was significantly higher than in Argentina.

One of the main limitations of our study was the low number of participants and the fact that most of them had tertiary education. Future research with the PET should include more representative samples of the general population. However, the present research has two main strengths which are worth highlighting. Firstly, our participants belonged to two different countries. Secondly, the use of images allowed us to assess empathy without the need for linguistic adaptation. Although the hypotheses were partially fulfilled, the scale presented satisfactory indices of reliability and validity.

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