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Relevance of Rorschach test in assessment of psychopathological symptoms and Executive Functions.

Pertinencia del test de Rorschach en la evaluacion de Síntomas Psicopatológicos y Funciones Ejecutivas.

Pertinência do teste Rorschach na avaliação de sintomas Psicopatológicos e fumções executivas.

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ABSTRACT

Nearly a hundred years since its inception, Rorschach test remains one of the worldwide reference psychological tests. In the last years we have observed processes of deep transformation in models and theories in clinical psychology and psychiatry and neurosciences have an increasing role. There is growing evidence supporting the relationship between psychopathology and cognitive functions, where Executive Functions (EF) represents a core target. It is essential to assess relevance and validity of the Rorschach in that new landscape.

This paper presents the correlations between Rorschach´s variables, a psychopathological scale SA-45, and EF scales DEX-Sp and FAB in a representative (N=80) Uruguayan sample.

We found that all dimensions of SA-45, DEX-Sp, FAB and sociodemographic variables shows significant correlations with many Rorschach variables. We conclude that the Rorschach test could be a clinical and cognitive test that could be useful in the new scientific landscape. We discuss some results that were not expected at all.

Keywords: psychopathology, Rorschach test, executive functions, psychological assessment, tests adaptation, empirical research.

RESUMEN

A casi cien años de su creación, el test de Rorschach sigue siendo uno de los tests psicológicos de referencia a nivel mundial. En los últimos años hemos observado procesos de profunda transformación en modelos y teorías en psicología clínica y psiquiatría. Las neurociencias ocupan un rol creciente. Hay cada vez más evidencias acerca de la relación entre psicopatología y funciones cognitivas, siendo las Funciones Ejecutivas (FE) un objetivo central. Es esencial evaluar la pertinencia y validez del Rorschach en este nuevo escenario.

El presente trabajo expone las correlaciones entre variables del Rorschach, de la escala psicopatológica SA-45, y de los tests de FE DEX-Sp y FAB, en una muestra representativa (N=80) uruguaya.

Encontramos correlaciones significativas entre todas las dimensiones SA-45, DEX-Sp, FAB y variables sociodemográficas con un amplio número de variables del Rorschach. Concluimos que el Rorschach puede ser un test psicopatológico y cognitivo de utilidad en este nuevo escenario. Discutimos algunos resultados que no se dieron del todo como era esperable.

Palabras clave: psicopatología, test de Rorschach, funciones ejecutivas, evaluación psicológica, validación de tests, investigación empírica.

RESUMO

A quase cem anos de sua criação, o teste Rorschach segue sendo um dos testes psicológicos de referência a nivel mundial. Nos últimos anos observamos processos de profunda transformação em modelos e teorias na psicologia clínica e psiquiatria. As neurociências ocupam um rol crescente. Existe cada vez mais evidências sobre a relação entre psicopatologia e funções cognitivas, sendo as funções executivas (FE) um objetivo central. É essêncial avaliar a pertinência e validez do Rorschach neste novo cenário.

O presente trabalho expõe as correlações entre variáveis do Rorschach, da escala psicopatológica SA-45, e dos testes FE DEX-Sp e FAB, numa mostra representativa (N=80) uruguaia.

Encontramos correlações significativas entre todas as dimensões SA-45, DEX-Sp, FAB e variáveis sociodemográficas com um amplo número de variáveis do Rorschach. Concluimos que o Rorschach pode ser um teste psicopatológico e cognitivo de utilidade neste novo cenário. Discutimos alguns resultados que não deram tudo como era esperável.

Palavras-chave: psicopatologia, teste de Rorschach, funções executivas, avaliação psicológica, validação de testes, investigação empírica.

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In brief, the Rorschach will complete a century since its creation (Rorschach, 1921). Since then, it is one of the emblematic test in clinical psychology, becoming one of the most used worldwide since the 30' (Louttit & Browne, 1947; Sundberg, 1961). Its first years were defined by an eminently psychoanalytical theoretical approach (Park, 2009). That was a strength when the psychoanalysis was a theory with wide dominance in the clinical psychology landscape worldwide. However, that involved serious questions related with the scientific nature of the psychoanalysis (Hunsley & Michael, 1999; Park, 2009). Many of these critics also fall upon the Rorschach test (Hunsley & Michael, 1999; Márquez Sánchez, 1986). Several researchers and associations had not recommended it use for the lack of scientific evidence (Hunsley & Michael, 1999).

Much of these criticisms was directed towards the way in which the test was administered, coded and analyzed (Park, 2009). The development of the Comprehensive System (Exner, 1969) for the administration, coding and interpretation of the Rorschach has given more statistical and psychometric rigor to the test (Park, 2009). This has allowed the development of several researches that have provided strong empirical evidence for the test (Ganellen, 2001; Hibbard, 2003; Hiller, Rosenthal, Bornstein, Berry, & Brunell-Neuleib, 1999; Meyer & Archer, 2001; Meyer, Riethmiller, Brooks, Benoit, & Handler, 2000; Park, 2009; Society for Personality Assessment, 2005). Due to this empirical evidence, the test is recommended nowadays by most of the associations related to the topic (Park, 2009; Society for Personality Assessment, 2005).

Nearly a hundred years since its inception, the test remains one of the worldwide reference psychological tests (Meyer & Archer, 2001; Society for Personality Assessment, 2005). It shows psychometric properties comparable with other reference tests in psychology such as MMPI and WAIS (Meyer & Archer, 2001). On the one hand, it provides information unobtainable through other instruments (Society for Personality Assessment, 2005). Furthermore, it is less sensitive to variables such as social desirability and self-perception than the self-report questionnaires (Meyer & Archer, 2001).

On the other hand, in the last years, Psychiatry and Clinical Psychology are in a turning point and going under deep reviews at all levels. The revision of the Diagnostic Manuals, such as the DSM-5 (American Psychiatric Association, 2013) and its NIMH counterpart the "Research Domain Criteria (RDoC)" (Insel et al., 2010), is a clear example. One of the most salient characteristics of these changes, especially regarding the RDoC, is the growing influence of neuroscience in the Mental Health field (Casey, Oliveri, & Insel, 2014; Esbec & Echeburúa, 2011; Insel et al., 2010; Skodol et al., 2011). In this regard, one of the contact points between neuroscience and clinical psychology is the study of the relations between neurocognitive functions and psychopathology. Nowadays, there is a growing body of literature regarding this point (Millan et al., 2012). Particularly, among those cognitive functions, three areas are highlighted: Attention, Memory and Executive Functions (EFs) (Casey et al., 2014, 2014; Caspi et al., 2013; Insel et al., 2010; Menon, 2011; Millan et al., 2012). Regarding EFs, nowadays is broadly known the relation between them and several mental disorders (Caspi et al., 2013; Menon, 2011; Millan et al., 2012; Ruiz Sanchez de León et al., 2010).

The EFs are a set of cognitive capabilities that works coordinated in order to fulfill goals (Pineda, Merchán, Rosselli, & Ardila, 2000). EFs are of great importance in social interaction because allow to respond appropriately and in a socially accepted way to complex or novel situations (Lezak, 2004). There are several theoretical approaches regarding which are those "executive functions" and how the functions are integrated between them and with other cognitive functions. The evidence seems to show that it is a function with distinguishable but related components (Miyake et al., 2000). Regarding the

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present study, the EF will be evaluated through the Frontal Assesment Battery (FAB) (Dubois, Slachevsky, Litvan, & Pillon, 2000) and the Spanish version (Pérez et al., 2009) of the Dysexecutive Questionnaire (DEX-Sp) (Wilson, Alderman, Burgess, Emslie, & Evans, 1996).

Regarding the psychopathological symptoms, we will rely on the 9 dimensions model proposed by Derogatis (1977) because it is widely accepted and used among the scientific community. The psychopathological screening instrument proposed by the author, SCL-90-R (Derogatis, 1977), is the most widely used worldwide. In this study, we will use a short version of the questionnaire, the SA-45 in its Spanish version (Sandín, Valiente, Chorot, Santed, & Lostao, 2008).

A bibliographic search in TIMBO databases (www.timbo.org.uy) was done looking for background regarding researches that studied correlations between Rorschach variables, SCL-90-R or SA-45 variables, and EF. There are studies that reported correlations between Rorschach variables and EF (Ilonen et al., 2004; Ilonen & Leinonen, 2000; Minassian, Granholm, Verney, & Perry, 2005). However, we have not found studies reporting correlations between Rorschach variables and SCL-90-R or SA-45.

This study aims to contribute to development and improvement of the Rorschach test through the study of correlations between the test and the psychopathological and neuropsychological assessment scales described above. Another goal is to study the feasibility of the item response theory (IRT) applied to Rorschach, in this research the "item independence" principle was studied.

Materials and Methods

The methodological design was a cross-sectional, correlational-causal (Hernández, Fernández, & Baptista, 2010).

Participants

Eighty Uruguayan residents participated in this study. They were recruited through a random representative "quota" sampling. Taking into consideration the data from the Statistics National Institute (Uruguay), census segments of the whole country were raffled pondering the amount of population of each one. Ten census segments were obtained. In each segment, two census tracks (approximately two blocks) were raffled. The sampling was made taking four subjects each block.

Ethical protocols were followed as established in Uruguayan current law. Project was approved by the Ethics Committee of the School of Psychology of the Universidad de la República (Uruguay).

Instruments

Following instruments were applied to all participants:

- Ad-hoc sociodemographic questionnaire that assesses: gender, age, educational level, job, number of siblings, number of children, first-born age, place of residence (current, adolescence and childhood), psychological attention, couple, friends, physical activity.
- Socioeconomical Index, INSE (CINVE, 2012), that assesses: socioeconomical level.
- Symptom Assessment-45, SA-45 (Sandín et al., 2008), that assesses: somatization, obsessions and compulsions, interpersonal sensibility, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism.
- Adaptation of the short version of Temperament and Character Inventory, TCI-140 (Gutiérrez-Zotes et al., 2004), that assesses: Harm Avoidance, Novelty Seeking, Reward Dependence, Persistence, Self-Directedness, Cooperativeness, Self-Transcendence.
- Reviewed Short version of the NEO questionnaire, NEO-FFI-R (Costa & McCrae, 2008), that assesses: Neuroticism, Extraversion, Openness, Agreeability, Conscience.
- Zuckerman-Kuhlman Personality Questionnaire transcultural short version, ZKPQ-50-CC (Póo, Ledesma, & López, 2013), that assesses:

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Impulsiveness-Non socialized Sensation Seeking, Neuroticism-Anxiety, Aggression-Hostility, Activity, Sociability.

- Dysexecutive Questionnaire, DEX-Sp (Pedrero-Pérez et al., 2009), that assesses: Inhibition, Intentionality, Executive memory, Positive and Negative Affect.
- Frontal Assessment Battery, FAB (Dubois et al., 2000), that assesses: Conceptualization, Cognitive flexibility, Motor programming, Inhibitory Control, Interference resistance, Environmental autonomy.
- Mini-Mental State Examination -MMSE- (Folstein, Folstein, & McHugh, 1975), that assesses: cognitive impairment.
- Rorschach test, the Comprehensive System was used (Exner, 2007), that assesses: variables related to personality and psychopathological symptoms.

Procedure

In each ruffled block, all houses were visited, starting in a random corner and following in the same block clockwise. The residents over 18 of those houses were invited to participate in the study, fulfilling the defined "quotas" regarding gender and four age groups (18-24, 25-30, 31-45, 45-60), in each census segment one empty "quota" was accepted. Four subjects per block were taken. In case of not completing the four cases in the raffled block, sampling was extended to near blocks. The chosen block was raffled among the nearest blocks.

In participant´s home, written consent was signed, after that, the Ad-hoc sociodemographic questionnaire, the FAB, the MMSE and the Rorschach were applied. The rest of the questionnaires (SA-45, DEX-Sp, TCI-140, ZKPQ-50-CC) were left to the participant to fulfill them later. Questionnaires were picked up later, at most 48 hours later than the test.

Exclusion criteria was:

- Less than 27 in the MMSE
- Answer wrongly two or more control items in the TCI-140
- Rorschach protocols with less that 14 answer

Eleven protocols were excluded and were replaced for new participants in the same block.

Regarding the Rorschach test, application was made in two different ways, one with the regular order of the inkblots (I to X), and other with a random order. Criteria was an application in chronological order in each application way.

The Rorschach tests were systematized using the 3.0 version of the "Rorschach Assistance Program" software. 126 Rorschach variables were taken, and subsequently all data collected with all the instruments were coded and analyzed using SPSS.

Results

Tables 1 and 2 show the details of the sample regarding gender and age, and education level, respectively.

Distribution of the variables was studied with the Kolmogorov-Smirnoff test. As a result, we found that most of the variables does not have a normal distribution. Therefore, nonparametric tests were used.

Table 1. Descriptives of gender and age.

Gender	Mean	N	S.D.	Min.	Max.
Female	41,69	45	18,587	18	86
Male	38,29	35	13,913	20	65
Total	40,20	80	16,692	18	86

Table 2. Descriptives of educational level.

Educational level	Frequency	Percentage
No studies	1	1,3
Incomplete primary school	3	3,8
Complete primary school	22	27,5
Incomplete high school	26	32,5
Complete high school	15	18,8
Incomplete university	5	6,3
Complete university	7	8,8
Graduate studies	1	1,3
Total	80	100,0

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As was explained before, the Rorschach was applied in two different ways, 42 subject received the standard application and 38 participants received a random version of the inkblots. A contrast between both groups modulated by the variables studied in Rorschach test, was made using the Mann-Whitney U test. Significant difference were found (sig.<0,01) in the following variables: DQv/+ (sig=0,004), Hd (sig=0,006), XA% (sig=0,001) and X-% (sig=0,004). Some of these variables are part of the Rorschach "special indexes", PTI, HVI and SCZI.

Table 3. Correlations between Rorschach and socio-demographic variables.

	Whole sample	"Standard" Rorschach sample
Educational level (0: no studies, 1: incomplete primary school, 2: complete primary school, 3: incomplete highschool, 4: complete highschool, 5: incomplete university, 6: complete university, 7: graduate studies)	**Zf (0,269, p 0,008), ZSum (0,325, p 0,002), ZEst (0,269, p 0,008),** W (0,242, p 0,015), D (-0,223, p 0,024), **DQ+ (0,269, p 0,004),** DQo (-0,244, p 0,015), FQx+ (0,189, p 0,047), **M (0,268, p 0,008),** CF (0,191, p 0,045), Y (-0,199, p 0,039), **F (-0,369, p 0,000), H (0,448, p 0,000), A (-0,358, p 0,001), (Ad) (0,233, p 0,001),** Art (0,222, p 0,024), Fd (-0,212, p 0,030), Fi (-0,199, p 0,039), **GHR (0,341, p 0,001), L (-0,378, p 0,000), EA (0,464, p 0,000), eb (-0,264, p 0,009),** D (0,200, p 0,038), **AdjD (0,340, p 0,001),** SumY (0,187, p 0,048), Afr (-0,194, p 00,42), **Compl/R (0,264, p 0,009),** activo (0,241, p 0,016), **SumH (0,428, p 0,000),** IndAisl (0,190, p 0,046), **Ma (0,288, p 0,005), Mp (0,269, p 0,008),** 2AB+Art+Ay (0,228, p 0,021), 3r+2/R (0,211, p 0,030), Fr+rF (0,198, p 0,040)	XA% (.308, p .024), **WDA% (.393, p .005),** X- (-.291, p .031)
Current job (0: unemployed, 1: occasional job, 2: stable job, no coded: others, retired, pensioner, etc)	Zf (0,248, p0,019), **Zsum (0,283, p0,009),** ZEst (0,248, p 0,019), W (0,215, p 0,037), D (-0,260, p 0,015), DQ+ (0,237, p 0,024), DQo (-0,240, p 0,023), C´ (-263, p 0,014), F (-0,263, p 0,014), H (0,201, p 0,048), A (-0,215, p 0,037), (A) (-0,221, p 0,033), Fi (-0,265, p 0,013), L (-0,217, p 0,036), EBPer (0,242, p 0,029), eb (-0,204, p 0,045), SumY (0,239, p 0,023), Compl/R (0,216, p 0,036), IndAisl (0,237, p 0,024)0,	Hd (-.307, p .034)
Number of children	FM (0,228, p 0,021), **CF (-0,299, p 0,003),** (H) (-0,238, p 0,017), An (0,210, p 0,031), Fd (0,196, p 0,040), MOR (0,245, p 0,014), PER (0,261, p 0,010), **EA (-0,307, p 0,003), D (-0,283, p 0,005), AdjD (-0,359, p 0,001),** SumH (-0,218, p 0,026), Mp (-0,190, p 0,046), An+Xy (0,199, p 0,039)	Hd (-.263, p .046), WDA% (-.327, p .017)
Amount of friends (according to the interviewee)	FQxo (-0,243, p 0,020), **m (0,303, p 0,005), FC (-0,289, p 0,007),** (2) (-0,276, p 0,010), Cg (-0,206, p 0,041), Hh (0,197, p 0,049), Sc (0,268, p 0,011), **Xy (0,295, p 0,006),** AB (0,199, p 0,047), COP (-0,252, p 0,016), SUMm (0,248, p 0,018), CC0,EE0,Nv2 (0,218, p 0,033), 3r+2/R (-0,266, p 0,012)	
Times/month that meet with friends	Zf (-0,214, p 0,036), ZEst (-0,214, p 0,036), **WD (-0,316, p 0,003), FQxo (-0,285, p 0,008),** C (0,273, p 0,010), Fr (-0,238, p 0,022), **(2) (-0,294, p 0,006), Ad (-0,293, p 0,006),** Bt (-0,242, p 0,020), COP (-0,200, p 0,046**), R (-0,294, p 0,006),** C (0,242, p 0,020), Ma (-0,224, p 0,029), CC0,EE0,Nv2 (0,211, p 0,038), **3r+2/R (-0,283, p 0,008),** Fr+rF (-0,222, p 0,030)	
Years in couple	W (0,294, p 0,020), Dd (-0,244, p 0,045), **S (-0,352, p 0,007), C´F** (0,332, p 0,010), Hd (-0,289, p 0,022), Sc (0,265, p 0,033), AG (0,274, p 0,028), EB (-0,263, p 0,034), Afr (0,250, p 0,042), SumH (-0,255, p 0,038), XA% (0,266, p 0,032), S- (-0,296, p 0,019)	
Spearman Statistical correlation and p between parentheses Significance level less than 0.01 in bold		

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Taking this into consideration, regarding the correlation analysis between those Rorschach variables and other, whole sample was taken in one side (N=80) and sample with the "standard" application on the other side (N=42). However, due to the fact that only four of 126 variables showed significant differences between the groups, complete sample should be used in following analysis, with the exception mentioned above. Assumption of item independence is mainly fulfilled, in 122 of the 126 studied variables. However, variables in which that assumption is not fulfilled are highly relevant at a clinical level.

Table 3 shows the significant unilateral correlations (Spearman) at 0,05 level between all studied variables from the Rorschach (special indexes are not included) with some socio-demographic characteristics. As can be observed, there are significant correlations among all socio-demographic mentioned variables and at least 13 Rorschach variables in the whole sample.

Regarding the variable "couple" (categorical variable) a Mann-Whitney U test was used. In the whole sample, significant differences were found according with the following pattern:

- Higher mean with couple: S (p 0,024), (Hd) (p 0,006), Ad (p 0,012), Id (p 0,036), OBS (p 0,019)
- Higher mean without couple: FC´ (p 0,038), (H) (p 0,015)

When the "standard application" sample was analyzed a higher mean in subjects "with couple" was found in the Hd variable (p 0,043).

Table 4 shows a significant unilateral correlations at 0,05 (Spearman) between the same Rorschach variables and the following scores: SA-45 (9 dimensions and total), DEX-Sp (total) and FAB (scores). Significant correlations were found between all SA-45, DEX-XP and FAB variables with at least four Rorschach variables.

From what was observed in Tables 3 and 4, it can be said synthetically that many of these correlations have the expected direction from a theoretical point of view, particularly the ones related with the Developmental Quality (DQ), human contents (H), special critic codes (CC.EE.) and inanimate movement (m). However, some variables showed an opposed direction to what was expected, e.g. Cooperative Movement (COP), Formal Quality (FQ) and some human movement indexes (M). The amount of variables that significantly correlate with FAB it is also remarkable.

Table 5 shows correlations (Spearman) within the whole sample between Rorschach special indexes and: some socio-demographic variables, SA-45, DEX-Sp and FAB scores. All Rorschach special indexes showed significant correlations with at least one of the other variables except the OBS. From the special indexes, DEPI, CDI and HVI showed significant correlations with at least one socio-demographic variable. Regarding the executive and psychopathological scales, PTI, CDI, S-CON and SCZI showed a significant correlation with at least one of the studied variables. It is remarkable the absence of expected correlations such as PTI or SCZI with Psychoticism and Paranoid Ideation, between DEPI and Depression, between OBS and Obsession-compulsion and HVI with Paranoid Ideation.

Regarding the SA-45, Depression, Psychoticism, Phobic anxiety and Paranoid Ideation, no correlations were found with the Rorschach special indexes. Regarding the executive scales, significant correlations were found between DEX-Sp and CDI, but in the opposed direction from what was theoretically expected. The same happened with the correlations of the CDI and the SA-45 scales.

Correlations between FAB and PTI-SCZI indexes were in the theoretically expected direction. However, neither of two indexes showed a significant correlation with SA-45 variables.

Table 6 shows correlations (Spearman) with PTI, HVI and SCZI within the Rorschach "standard application" sample as it was specified before. A similar pattern was shown, regardless significant correlations of the SCZI with educational level and PTI with obsession-compulsion.

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Table 4. Correlations between Rorschach, SA-45, DEX-Sp and FAB

	Whole sample	"Standard" Rorschach sample
Depression	FD (0,187, p 0,048), Hd (-0,213, p 0,029), Xy (-0,193,p 0,043), Sum6 (-0,243, p 0,015), SumPond6 (-0,207, 0,033), **PER (0,275, p 0,007),** C (-0,228, p 0,021), Afr (0,216, p 0,027), Ma (0,245, p 0,014), Mp (0,245, p 0,014)	
Hostility	ZSum (0,187, p 0,048), W (0,217, p 0,027), DQv/+ (-0,216, p 0,027), C´ (0,207, p 0,033), FT (0,202, p 0,036), YF (0,227, p 0,022), (Hd) (0,192, p 0,044), Cl (-0,189, p 0,047), Fd (-0,207, p 0,033), Id (0,187, p 0,049), COP (0,204, p 0,035), **EBPer (0,286, p 0,007),** SumH (0,208, p 0,032), XA% (0,187, p 0,048)	
Interpersonal Sensitivity	**m (-0,344, p 0,001), CF (0,315, p 0,002),** Cl (0,228, p 0,021), **Fi (0,320, p 0,002), Xy (-0,267, p 0,008),** COP (0,241, p 0,015), SUMm (-0,207, p 0,033), Ma (0,209, p 0,031), XA% (0,260, p 0,010), 3r+2/R (0,198, p 0,039)	
Somatization	FQxo (0,190, p 0,046), **(2) (0,287, p 0,005), H (0,305, p 0,003),** Cl (0,224, p 0,023), Fi (0,218, p 0,026), Xy (-0,236, p 0,018), **COP (0,315, p 0,002),** GHR (0,229, p 0,020), PER (0,227, p 0,021), **Afr (0,274, p 0,007), activo (0,301, p 0,003), Ma (0,424, p 0,000), XA%, (0,292, p 0,004), WDA% (0,315, p 0,002),** X-% (-0,195, p 0,042), P (0,197, p 0,040), X+% (0,220, p 0,025), 3r+2/R (0,237, p0,017)	
Anxiety	Dd (0,215, p 0,028), FQx+ (0,206, p 0,034), m (-0,260, p 0,010), CF (0,211, p 0,030), C´(0,190, p 0,046), H (0,212, p 0,030), Fi (0,242, p 0,015), AB (-0,261, p 0,010), **COP (0,264, p 0,009),** PER (0,209, p 0,031), eb (-0,232, p 0,019), SUMm (-0,205, p 0,00,34), SumY (0,199, p 0,038), Afr (0,258, p 0,010), Ma (0,206, p 0,034), 2AB+Art+Ay (-0,208, p 0,032), XA% (0,230, p 0,020), WDA% (0,187, p 0,048), X-% (-0,198, p 0,039)	
Psychoticism	**m (-0,301, p 0,003),** (Hd) (0,186, p 0,049), (A) (0,207, p 0,033), **Fd (-0,263, p 0,009)**	
Obsession compulsion	**m (-0,303, p 0,003), CF (0,301, p 0,003),** (2) (0,218, p 0,026), Bt (0,216, p 0,027), Cl (0,201, p 0,037), COP (0,245, p 0,014), PHR (0,205, p 0,034), EA (0,222, p 0,024), es (0,187, p 0,049), Adjes (0,192, p 0,044), SumY (0,218, p 0,026), activo (0,213, p 0,029), IndAisl (0,186, p 0,049), **Ma (0,282, p 0,006),** 3r+2/R (0,216, p 0,026)	Hd (.314, p .021)
Phobic anxiety	Dd (0,202, p 0,036), DQv/+ (0,242, p 0,015), m (-0,194, p 0,042), Ad (-0,217, p 0,027), Na (0,208, p 0,032), Ma (0,216, p 0,027), WDA% (0,220, p 0,025), S- (0,260, p 0,010)	
Paranoid ideation	m (-0,261, p 0,010), **FC´ (-0,280, p 0,006),** YF (0,200, p 0,038), Art (-0,221, p 0,024), Ex (-0,244, p 0,015), SUMm (-0,193, p 0,043), Ma (0,242, p 0,015), XA% (0,236, p 0,017), WDA% (0,194, p 0,042),	
SA-45 Total	**m (-0,272, p 0,007),** Fi (0,216, p 0,027), Xy (-0,238, p 0,017), COP (0,235, p 0,018), PER (0,233, p 0,019), Ma (0,198, p 0,039)	
DEX-Sp	m (-0,224, p 0,023), CF (0,247, p 0,014), Ad (-0,200, p 0,038), Cl (0,226, p 0,022), Fi (0,525, p 0,012), COP (0,204, p 0,035)	
FAB	Zf (0,205, p 0,034), ZEst (0,205, p 0,034), S (0,188, p 0,047), DQ+ (0,238, p 0,017), FQx- (-0,220, p 0,025), **M (0,296, p 0,004),** H (0,205, p 0,034), (H) (0,198, p 0,039), Hx (0,218, p 0,026), Art (0,222, p 0,024), Fd (-0,233, p 0,019), **Sc (0,265, p 0,009),** GHR (0,245, p 0,014), PHR (0,195, p 0,041), L (-0,200, p 0,037), EB (-0,200, p 0,037), **EA (0,267, p 0,008),** AdjD (0,230, p 0,020), C (0,196, p 0,041), pasivo (0,230, p 0,020), **SumH (0,300, p 0,003), Mp (0,345, p 0,001),** 2AB+Art+Ay (0,217, p 0,026), X-% (-0,213, p 0,029)	Hd (.294, p .029), **XA% (.373, p .007),** WDA% (.317, p .020), **X- (-.372, p .008)**
Spearman Statistical correlation and p between parentheses Significance level less than 0.01 in bold		

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(Part 1) **Table 5.** Correlations between special indexes, SA-45, DEX-Sp and FAB (whole sample).

		PTI	DEPI	CDI	S-CON	HVI	OBS	SCZI
Educational level	Corr.	-0,078	**0,187***	**-0,298****	-0,048	**0,190***	0,079	-0,110
	Sig.	0,245	**0,049**	**0,004**	0,336	**0,046**	0,243	0,165
Current job	Corr.	0,045	0,115	-0,189	-0,020	0,089	0,095	0,011
	Sig.	0,356	0,172	0,059	0,434	0,231	0,218	0,465
Number of children	Corr.	0,007	-0,051	0,068	0,023	**-0,190***	0,011	0,049
	Sig.	0,477	0,328	0,274	0,419	**0,045**	0,461	0,332
Amount of friends	Corr.	0,089	**0,264***	**0,201***	0,190	-0,058	-0,098	0,038
	Sig.	0,229	**0,013**	**0,045**	0,055	0,313	0,206	0,377
Times/month that meet with friends	Corr.	-0,011	**0,280****	0,152	0,151	-0,117	-0,110	0,022
	Sig.	0,462	**0,009**	0,101	0,103	0,164	0,180	0,428
Years in couple	Corr.	-0,006	-0,121	-0,141	0,073	-0,041	-0,201	0,024
	Sig.	0,483	0,204	0,166	0,310	0,389	0,083	0,436
Depression	Corr.	-0,077	0,099	-0,128	-0,008	-0,049	0,022	-0,087
	Sig.	0,249	0,191	0,129	0,470	0,334	0,425	0,222
Hostility	Corr.	-0,120	-0,043	**-0,334****	-0,070	0,039	-0,093	-0,053
	Sig.	0,144	0,353	**0,001**	0,268	0,366	0,207	0,321
Interpersonal sensitivity	Corr.	-0,159	-0,115	**-0,296****	-0,072	0,041	-0,073	-0,134
	Sig.	0,079	0,154	**0,004**	0,264	0,360	0,261	0,119
Somatization	Corr.	-0,176	-0,114	**-0,290****	**-0,193***	-0,055	0,100	-0,158
	Sig.	0,060	0,158	**0,005**	**0,043**	0,313	0,189	0,081
Anxiety	Corr.	-0,144	-0,054	**-0,228***	-0,035	-0,037	0,065	-0,141
	Sig.	0,101	0,317	**0,021**	0,381	0,373	0,284	0,106
Psychoticism	Corr.	0,099	-0,045	-0,181	0,107	0,136	0,122	0,107
	Sig.	0,192	0,346	0,054	0,172	0,115	0,140	0,172
Obsession compulsion	Corr.	0,019	-0,126	**-0,256***	-0,103	0,020	-0,015	0,021
	Sig.	0,434	0,132	**0,011**	0,183	0,432	0,449	0,428
Phobic anxiety	Corr.	-0,120	-0,115	-0,025	-0,089	-0,070	0,116	-0,145
	Sig.	0,144	0,155	0,413	0,217	0,269	0,153	0,099
Paranoid ideation	Corr.	0,020	-0,086	-0,154	-0,002	0,042	0,061	-0,053
	Sig.	0,432	0,224	0,087	0,491	0,355	0,296	0,321
SA-45 total	Corr.	-0,101	-0,100	**-0,280****	-0,090	-0,008	0,025	-0,105
	Sig.	0,185	0,188	**0,006**	0,214	0,471	0,412	0,177

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(Part 2) **Table 5.** Correlations between special indexes, SA-45, DEX-Sp and FAB (whole sample).

		PTI	DEPI	CDI	S-CON	HVI	OBS	SCZI
DEX-SP	Corr.	-0,036	-0,037	**-0,185***	-0,041	-0,045	-0,007	-0,048
	Sig.	0,377	0,371	**0,050**	0,357	0,348	0,476	0,337
FAB	Corr.	**-0,333****	-0,011	-0,121	-0,130	0,029	0,150	**-0,227***
	Sig.	**0,001**	0,461	0,143	0,126	0,400	0,091	**0,022**
PTI	Corr.		**0,244***	**0,270****	**0,322****	**0,259***	-0,060	**0,713****
	Sig.		**0,014**	**0,008**	**0,002**	**0,010**	0,300	**0,000**
DEPI	Corr.	**0,244***		**0,186***	**0,469****	0,159	-0,047	0,056
	Sig.	**0,014**		**0,049**	**0,000**	0,080	0,339	0,311
CDI	Corr.	**0,270****	**0,186***		**0,445****	-0,058	**-0,204***	0,177
	Sig.	**0,008**	**0,049**		**0,000**	0,305	**0,035**	0,058
S-CON	Corr.	**0,322****	**0,469****	**0,445****		**0,286****	-0,087	**0,230***
	Sig.	**0,002**	**0,000**	**0,000**		**0,005**	0,221	**0,020**
HVI	Corr.	**0,259***	0,159	-0,058	**0,286****		**0,419****	0,152
	Sig.	**0,010**	0,080	0,305	**0,005**		**0,000**	0,089
OBS	Corr.	-0,060	-0,047	**-0,204***	-0,087	**0,419****		-0,183
	Sig.	0,300	0,339	**0,035**	0,221	**0,000**		0,052
SCZI	Corr.	**0,713****	0,056	0,177	**0,230***	0,152	-0,183	
	Sig.	**0,000**	0,311	0,058	**0,020**	0,089	0,052	

Significant correlation level less than 0.05 in bold
** Unilateral significant correlation at 0.01
* Unilateral significant correlation at 0.05

Discussion

As it was mentioned before, this study aims to contribute to improvement of the Rorschach technique. One aspect that is intended to asses is the "items independence" principle in Rorschach test. This could be achieved comparing the test results of standard and randomized applications. It seems that there is not an effect of order in most variables, therefore it could be said that the items independence principle is fulfilled. However, variables that showed significant differences between both groups have clinical relevance. This could explain the absence of expected correlations between these variables, indexes that are influenced by them (PTI, HVI, SCZI) and psychopathological dimensions assessed by the SA-45. Delving into the causes of theses significant differences in these variables between the groups goes beyond the scopes of this study. However, a "warming" effect in the first inkblots seems plausible.

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Two of those variables are related with formal quality of the answers. Within the "standard" applications there was a high frequency of Hd responses with a bad viewed shape (F-) in the inkblot I (usually a face or a smiling face). An "spurious" correlation can be observed. Other possibility is that inkblots I and II have a higher difficulty than others, and because of that a higher frequency of responses with a bad shape is generated while subject is adapting to a novel task. Further research is needed in order to establish conclusions regarding this point.

Regarding correlations between Rorschach and socio-demographic variables, there is a wide range of variables that shows significant correlations with areas of clinical relevance such as education, work, family, social and sentimental relations. The "ecological" validity of Rorschach is maybe its greatest virtue. Large number of variables makes difficult to perform a detailed analysis in a work such as this paper. However, it is highlighted that observed correlations are in line with the theoretically expected.

Correlations between the Rorschach variables and SA-45, DEX-Sp and FAB dimensions are present in a large number and in most cases in theoretically expected direction. Relations between symptoms severity and m, DQ, H, and with special codes are particularly noteworthy. On the other hand, other variables shows a direction that is opposite to the expected, particularly COP, CDI, HVI and OBS. COP is a content related to positive and cooperative pro-sociality. Due to that, correlations between COP and SA-45 dimensions are striking. Something similar, but backwards, happens with the CDI social inability index, because a positive correlation with SA-45 it is expected, however, the opposite happened. HVI, OBS and SCZI did not show correlations with any of the SA-45 dimensions, this also is striking. Regarding executive functions, DEX-Sp shows significant correlations with several Rorschach variables, and special indexes with CDI (though in the opposite direction to expectable). FAB showed significant correlations with a wide range of Rorschach variables, more than the DEX-Sp, almost all of them in theoretically expected direction. Also it showed significant correlations

(Part 1) **Table 6.** Correlations between PTI, HVI , SCZI and: SA-45, DEX-SP and FAB ("standard" application).

		PTI	HVI	SCZI
Educational level	Corr.	-0,245	0,184	**-0,282***
	Sig.	0,059	0,122	**0,035**
Current job	Corr.	0,036	-0,035	-0,026
	Sig.	0,417	0,419	0,440
Number of children	Corr.	0,186	-0,086	0,182
	Sig.	0,120	0,294	0,125
Amount of friends	Corr.	0,007	-0,240	-0,097
	Sig.	0,484	0,077	0,284
Times/month that meet with friends	Corr.	-0,075	-0,196	-0,047
	Sig.	0,329	0,123	0,392
Years in couple	Corr.	0,006	0,028	0,006
	Sig.	0,489	0,449	0,488
Depression	Corr.	0,020	-0,183	-0,044
	Sig.	0,449	0,123	0,390
Hostility	Corr.	-0,029	0,031	0,018
	Sig.	0,428	0,423	0,454
Interpersonal sensitivity	Corr.	-0,064	0,117	-0,076
	Sig.	0,344	0,231	0,315
Somatization	Corr.	-0,141	0,064	-0,083
	Sig.	0,187	0,344	0,300
Anxiety	Corr.	0,098	0,040	0,063
	Sig.	0,267	0,400	0,346
Psychoticism	Corr.	0,218	0,211	0,128
	Sig.	0,083	0,090	0,209
Obsession compulsion	Corr.	**0,280***	0,190	0,214
	Sig.	**0,036**	0,114	0,087
Phobic anxiety	Corr.	-0,177	-0,116	-0,155
	Sig.	0,131	0,231	0,164
Paranoid ideation	Corr.	0,099	0,178	-0,003
	Sig.	0,267	0,129	0,492
SA-45 total	Corr.	0,072	0,059	0,004
	Sig.	0,326	0,355	0,491

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with the PTI and SCZI, with more executive performance associated with lower scores in both special indexes, as it was expected.

Conclusions

Taking these data into consideration some conclusions and hypothesis can be drawn:

1. It is possible, subject to certain exceptions, to presupposes the "ítems independence" assumption in Rorschach test. Further studies should be carried out in order to evaluate why 4 variables did not fulfill this assumption. One hypothesis is that the first, or the first and second inkblot do not fulfill that assumption, because the subject is adapting to a new task.
2. Several Rorschach variables showed significant correlations with socio-demographic, psychopathological and EF variables. Particularly FAB (that studies the EFs considered "cold" or "cognitive") is related with a wide range of Rorschach variables. Those are related with social-interpersonal functioning, psychopathology and neuropsychological variables. In a technical-scientific background that demands the integration of those aspects, Rorschach could be a useful tool, appearing as a test of cognitive and psychopathological assessment.
3. Special indexes showed a deficient functioning, and even more considering the wide range of Rorschach variables related with social-interpersonal functioning, clinical and neuropsychological variables. Limitations of the study (will be addresses bellow) could explain this phenomena, though it is also possible that those items, as they are diagrammed, are not suitable for this population. Based on the wide range of correlations of Rorschach variables with the other studied variables, we believe that is possible to redesign that indexes in order to have more suitable psychometric properties.
4. Working with a broader sample, conducting factor analyzes would be relevant in order to establish Rorschach indexes associated with psychopathological and cognitive variables in a more reliable way.
5. We understand that it is possible to redefine the way we work around Rorschach test, as a neurocognitive test. It involves the resolution of a cognitively complex and unstructured task, it requires the participation of several neuropsychological functions (Acklin

(Part 2) **Table 6.** Correlations between PTI, HVI , SCZI and: SA-45, DEX-SP and FAB ("standard" application).

		PTI	HVI	SCZI
DEX-SP	Corr.	0,066	0,058	0,053
	Sig.	0,340	0,358	0,369
FAB	Corr.	**-0,398****	-0,004	**-0,342***
	Sig.	**0,005**	0,490	**0,013**
PTI	Corr.		0,221	**0,789****
	Sig.		0,080	**0,000**
DEPI	Corr.	0,095	0,011	-0,058
	Sig.	0,274	0,472	0,357
CDI	Corr.	0,238	-0,190	0,175
	Sig.	0,065	0,114	0,134
SCON	Corr.	0,237	0,061	0,191
	Sig.	0,065	0,350	0,112
HVI	Corr.	0,221		0,225
	Sig.	0,080		0,076
OBS	Corr.	0,004	**0,460****	-0,035
	Sig.	0,491	**0,001**	0,412
SCZI	Corr.	**0,789****	0,225	
	Sig.	**0,000**	0,076	

Significant correlation level less than 0.05 in bold
** Unilateral significant correlation at 0.01
* Unilateral significant correlation at 0.05

& Wu-Holt, 1996). This process involves neural areas and circuits that are relevant to the cognitive function and its dysfunctions are related with several psychopathology conditions (Selma, en prensa).

Having said that, we want to highlight some limitations of this research that are relevant. First, our sample collecting method has a strength due to its representativeness. However, it has a weakness because the administration procedures significantly differ from ones that we could usually find in a clinical or experimental setting. Particularly, in Rorschach administration, physical environment (participants' homes), and previous bond between interviewer and participant (Rorschach was applied 10-12 minutes after they met) are not ideal conditions for the quality of Rorschach protocols. Besides, having a wider and gender-balanced sample would have been desirable.

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