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Comparative study of adolescents with Rorschach: public and private schools

Estudo comparativo de adolescentes com o Rorschach: escolas públicas e particulares

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Abstract

Objective

This investigation presents a comparison among students from public and private schools in specific variables of the Rorschach test, Comprehensive System.

Method

One hundred eighteen adolescents from the city of São Paulo participated in the study, aged 13-17 years, from public ($N = 49$) and private schools ($N = 69$). Mixed linear effects models were used to test the effect of school, controlled by sex, years of education (fixed effects), and evaluator (random effect).

Results

Private schools students presented higher values of R ($p = 0.015$, $d = 0.47$) and *Complexity* scores ($p = 0.007$, $d = 0.53$). After inserting *Complexity* as a fixed factor in the model, the only variable that remained significant was $Xu\%$ ($p = 0.008$, $d = -0.52$), lower in private schools students.

Conclusion

The small number of differences found in this study indicates, at least for this age range, a trend to equivalent performance when comparing private and public schools. Even though the Rorschach is a method of personality assessment, it is clear that it can also signalize information related to each group's personal experiences.

Keywords: Adolescent; Comprehensive system; Education; Personality; Rorschach Test.

Resumo

Objetivo

O estudo apresenta um comparativo dos resultados do Rorschach – Sistema Compreensivo – entre estudantes de escolas públicas e privadas.

Método

Participaram da pesquisa 118 adolescentes da cidade de São Paulo, 49 de escolas públicas e 69 de escolas particulares, com idade entre 13-17 anos. Os efeitos da escola foram avaliados por modelos lineares mistos controlados por sexo, anos de estudo (fatores fixos) e aplicador (fator aleatório).

Resultados

As escolas particulares apresentaram maiores valores de R ($p = 0,015$, $d = 0,47$) e Complexidade ($p = 0,007$, $d = 0,53$). Quando Complexidade também foi inserida no modelo como fator fixo, a única variável que restou significativa foi Xu% ($p = 0,008$, $d = -0,52$), menor em escolas particulares.

Conclusão

Conclui-se que o pequeno número de diferenças indica pouca interferência da origem escolar nos resultados do Rorschach para esta faixa etária. Mesmo se tratando de um instrumento para avaliação de personalidade, foi possível sinalizar algumas informações relativas às experiências pessoais de cada grupo.

Palavras-chave: Adolescente; Sistema compreensivo; Educação; Personalidade; Teste de Rorschach.

Among the research conducted with the Rorschach test, few researchers have dedicated their attention to studies with adolescents. Although most studies with samples in this age group have been carried out using self-report inventories or interviews, a growing number of studies have been performed using the Rorschach (Balottin et al., 2018; Joubert & Webster, 2017; McHale et al., 2020; Schneider et al., 2020). This trend is also evident regarding normative research: many Rorschach normative studies were conducted for adults and children but few for adolescents.

Normative data are references for use in individual protocols, but they can also indicate the predominant characteristics of each group to which they were constituted. Rorschach normative studies for all ages were a trend at the beginning of this century, motivated by the need to refer to specific norms for each population. This interest may have been derived, on the one hand, by the influence of publications at the end of the last century in the Journal of Personality Assessment: several studies were published pointing to cultural differences in test results. In addition, an impossibility of evaluating the Rorschach protocols using Exner's (2003) norms for the Comprehensive System (CS) was noted in diverse populations: when used, they often suggested pathologies in the results.

Regarding adolescents' research in the CS, the publication by Exner and Weiner (1995) can still be considered an international reference. However, different norms for adolescents have been published using the CS in countries such as Italy, the United States, and Israel. In a 2007 special edition of the same Journal of Personality Assessment, norms for adults were presented in 17 countries, and only two showed adolescent samples, evidencing the lack of studies in this age group. In an attempt to group these normative youth data, Meyer et al. (2007) noted that children's and adolescents' results showed many differences and even more divergences when compared to Exner's norms (2003). More recently, efforts to compose adolescent norms have been performed in Brazil (Nascimento et al., 2017).

Public and Private Schools

Education is a complex issue, and numerous factors can contribute to a better quality or prevent the appropriate development of students. National and international studies and evaluations

have been conducted to evaluate students' performance in elementary, middle, and high school, such as 1) the *Primeiro Estudo Internacional Comparativo* (First International Comparative Study), carried out in fourteen Latin American countries (Casassus, 2007), 2) the *Prova Brasil* (Brazil Evaluation) of the Ministry of Education and Culture <<http://portal.mec.gov.br/prova-brasil>>, and 3) the *Sistema de Avaliação do Ensino Básico*, (SAEB, Basic Education Assessment System) <<https://www.gov.br/inep/pt-br/areas-de-atuacao/avaliacao-e-exames-educacionais/saeb>>. These evaluations allow the knowledge of the processes and mechanisms that originate and maintain inequalities in the educational field. Also, they enable planning actions for education (Fontanive et al., 2021).

In Brazil, we have the *Índice de Desenvolvimento do Ensino Básico* (IDEB, Basic Education Development Index) for elementary and high school students. This index has been registering imbalance points between different schools for years, either by country region, type of city (number of inhabitants, urban or rural), or between different administrative strata (public or private). According to the *Conselho de Desenvolvimento Econômico e Social* (CDES, Economic and Social Development Council), the IDEB has been calculated since 2005, based on the *Prova Brasil* and information about the education school census results carried out annually by the *Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira* (Anísio Teixeira National Institute of Educational Studies). These tests (*Prova Brasil* and SAEB) are performed to monitor the quality of education (both in public and private schools, based on school performance), the average approval pass rate of students in each educational stage, and establishing goals and the agenda for public education policies. Results of these evaluations show that students from public schools maintain, for years, lower results in exams when compared to private school students. In general, the results of public schools in these evaluations are insufficient, despite the increase in government policies aimed at improving the educational level of its population and guaranteeing schools for all children.

Rorschach and the Different Modalities of School Organization

Although much is said about education inequality, this condition has not been a frequent subject of studies with psychological tests, especially free-response tests. Still, some Brazilian studies in the last decade have used the Rorschach to evaluate the different school organization modalities. For example, the study by Ribeiro et al. (2011), conducted with children aged 7 to 10 years, found statistically significant divergences indicating greater freedom of expression and more presence of cultural and intellectual interests among children of private schools (increased frequency of responses [R] and increased Intellectualization Index). Throughout interviews carried out in this research, the authors noticed that private school children were more stimulated by school and family, being more pressured for extracurricular activities, which possibly caused them more stress (higher Sum Y and Blends). Years before, Exner and Weiner (1995) also found a difference between samples that indicated that children of lower socioeconomic status had higher Lambda values.

Another study on the difference between educational modalities and the Rorschach method was conducted by Cury-Jacquemin et al. (2012), evaluating young people in the first stage of adolescence (12 to 14 years old) with the Parisian School System. This study showed a higher R and number of good formal quality responses (F+) among students from private schools. In contrast, students from public schools showed higher sum of movement (sum movement) and sum of animal movement responses (FM), and a slight increase in banal responses (Ban). A second study using the Parisian School, conducted with young people aged 15 to 17 years, showed that public school students had a higher R and F%, but a smaller number of global responses (G), sum movement, and Ban in relation to young people in private education (Jardim-Maran et al., 2015). In addition,

other less important indications in this comparative study were observed in the content variables. However, the authors considered that the evidence they found is still inconsistent in defining the differences between the groups. This justified the lack of different normative tables depending on the school's condition, although they consider it an important aspect to be taken into account in clinical practice.

Strictly speaking, the results suggest the influence of cultural and environmental aspects on the Rorschach results. According to the CS, these questions were fundamental when conducting the normative study, for adolescents in the city of São Paulo (Nascimento, 2015). During the normative study, analyses were conducted to compare the adolescent population aged 13 and 14 years old with those aged 15 to 17 years old, as well as between adolescents and adults: although few discrepancies were found when comparing adolescents, there were differences compared to adults. These results led to considering the total sample of adolescents without stratifying by age (Nascimento, 2015).

Based on the normative research, the importance of investigating the similarities and differences between public and private school adolescent students was also considered, as was previously done with children (Ribeiro et al., 2011). Therefore, the present study was planned from empirical findings throughout the data collection of differences between participants of distinct school modalities, and based on previous studies and publications about the different teaching segments, which reported significant and relevant disparities (Cury-Jacquemin et al., 2012; Jardim-Maran et al., 2015; Nascimento, 2015; Ribeiro et al., 2011).

Although previous Rorschach studies referring to this theme were conducted, all with unquestionable quality, none has covered this age group (adolescents aged 13-17 years) using the CS, increasing the importance of the present study. Thus, this article will present the comparisons of public and private school students in selected variables of the Rorschach CS. In addition to considering the CS indexes and constellations, variables related to all its sections were analyzed: information processing, cognitive mediation, ideation, control and stress tolerance, affective features, interpersonal, and self-perception relationships.

Method

Participants

The present study evaluated 118 adolescents aged 13 to 17 years, non-patients, of both sexes, from public and private schools, and all socioeconomic levels from São Paulo. The research was approved by the Ethics Committee of the Pontifical Catholic University of São Paulo (PUC-SP), protocol #048/2007. In addition to a signed informed consent form, by the parents, (or legal guardian), the following inclusion criteria were adopted: (a) adolescents between 13 and 17 years of age living in São Paulo; (b) students from public or private schools; (c) regular students at the end of elementary school ("fundamental", cycle II) and high school; (d) of both sexes; (e) from all socioeconomic strata. Exclusion criteria were: (a) adolescents with more than one failure in their curriculum; (b) a history of psychological or psychiatric treatment.

Participants were sought in their study environments, which should be varied: distinct schools, public and private, in different regions of the city. To this end, contacts were established with each school coordinator or principal. The sample included a maximum of 10% of students from the same school (twelve participants). To finish data collection, additional adolescents were recruited in public spaces and through indication, always in accordance with the inclusion and exclusion criteria.

Procedure

Data collection was acquired after the subject's voluntary agreement and parental (or legal guardian) authorization for participation in the research. When there were adequate conditions for the evaluations in the schools, the assessment occurred in the institutions. Otherwise, the meeting was scheduled in an appropriate place for the application, such as at PUC-SP classrooms, the coordinator's office, or the participants' homes. Regardless of the place in which the evaluation was conducted, criteria for a good application have always been considered, such as 1) a quiet place, 2) adequate ventilation, 3) good lighting, 4) privacy (absence of people circulating), and 5) previous organization of the necessary material.

During the assessment, the evaluation always took place in the following order: 1) a small interview to establish rapport, collect demographic data, and guarantee the inclusion/exclusion criteria of the participants; 2) a questionnaire for evaluating the socioeconomic level according to the table of the Brazilian Association of Market Research Institutes (ABIPEME) of 2008; 3) instructions and explanations about the research and the evaluations' objectives; 4) Rorschach administration.

The research team consisted of three psychologists who received a Technical Training scholarship from the São Paulo Research Foundation (FAPESP), and three college students from PUC-SP who received a scientific initiation scholarship from FAPESP or CNPq. All evaluators were graduated or undergraduate students from PUC-SP, where students take two mandatory semesters studying the Rorschach SC, totaling 102 hours of workload. In addition, a volunteer psychologist contributed with one application, and the research coordinator (RSGFN) had to evaluate two adolescents because two schools requested her presence on the research team.

All evaluators received the same training and conducted the research in the same way, having carried out intensive preparation with the coordinator before and during the research. The coordinator also supervised all research procedures and prepared examiners for coding and scoring the Rorschach's variables. Each protocol was scored twice, and discrepancies were checked during meetings with the coordinator.

A classification concordance study (inter-rater reliability, IRR) with three external judges investigated 567 responses, referring to 26 survey protocols, or 22% of the total. For this study, in addition to the six basic coding grouping 1) location; 2) developmental quality; 3) determinants; 4) form quality; 5) contents, and 6) special codes, the variables 1) Pair (2); 2) Popular (P) and 3) Z Scores, were also evaluated.

Data Analysis

Statistical analyses were conducted with JASP (version 0.13.1), R Core (version 3.6.0), and IBM®SPSS® (version 24.0). The following statistical tests were performed:

1) For the IRR study with external judges, the Kappa coefficient was used in the six groupings, Par and Popular. For the Z Score, we used the Intraclass Correlation (ICC).

2) Between-group demographic variables were compared using Student's *t*-tests for continuous variables (age and years of schooling) and the chi-square test for categorical variables (gender and socioeconomic level).

3) A mixed linear model was used to compare participants between public and private schools (R package 'nlme', version 3.1-152), controlling for fixed effects (such as sex, age or years of study) and

also random effects (such as the evaluator who performed the data collection). This type of analysis is particularly interesting for this study design because, although trained and closely supervised, there could be a part of the variability in the Rorschach responses that could be explained by the evaluator. With mixed models, it is possible to control for this factor. The effect size (Cohen's *d*) was calculated using the 'EMAtools' R package (version 0.1.3).

4) As several mixed models were performed, and multiple testing increases the probability of false positives, we used the Bonferroni criterion to control for multiple comparisons. The correction was performed separately for each section, according to the number of variables studied in that section. For example: the information processing section had eight variables, so the statistical significance criterion adopted was $0.05/8$, or 0.0065 .

Comparisons were performed for the following variables: R, F%, Complexity (responsiveness and engagement section); Zf, Zd, W, D, Dd, DQ+ and DQv (information processing section); P, XA%, X-%, Xu% and X+% (cognitive mediation section); M, FM+m, active-passive (a-p), WSum6, Lvl2 and MOR (ideation section); EA, es, D Scores, AdjD (stress control and tolerance section); Afr, WSumC, FC-(CF+C), Shading Sum and Texture Sum (affective features section); Egocentricity Index (ego), Pairs and Form Dimension (FD) (self-perception section); Good Human Representational Responses (GHR), Poor Human Representational Responses (PHR), Sum of Human Responses $H+(H)+Hd+(Hd)$ and $H-[(H)+Hd+(Hd)]$ (interpersonal perception section). Finally, the following indexes were evaluated: CDI, DEPI, HVI, PTI, EII-2 (Viglione et al., 2003), and developmental index (DI), according to Resende et al. (2019).

The complexity of Rorschach protocols began to be explored by Exner (Exner & Weiner 1995; Exner, 2003), who warned about the validity of shorter protocols, especially those with less than fourteen responses and elevated Lambda. Even with a high number of responses, Lambda augmentation was defined as a simplifying style, found in people who ignore the complexity of the stimulus. Later, Donald Viglione mentioned about the complexity of the protocols when he stated that defensiveness and expressiveness could be associated with the number of responses and the complexity of the protocol. The introduction of the *Complexity* variable as a covariate in statistical models is important because it can interfere with the prediction and interpretation of Rorschach results as it is related to cognitive flexibility and problem-solving skills. Thus, the authors who study and develop the test recommend not combining protocols with different *Complexity*. Initially, the number of responses (R) and the percentage of form responses (F%) were considered to control for this factor. Recent studies using the Performance Assessment System (R-PAS) proposed changes in this variable calculation, including Rorschach indicators, namely: Location (W, D, and Dd) and Developmental Quality (DQ+ and DQv), number of Determinants and Contents (Meyer et al., 2017). These new indicators were used in the present study, and *Complexity* was calculated as a simple sum of three components for each response: 1) complexity of location, space, and object (vague without synthesis = 0; vague/synthesized or not-vague without synthesis = 1; synthesized with D or Dd = 2; Synthesized with W or any S = 3); 2) content complexity (A, (A), Ad or (Ad) = 0; non-animal single content = 1; multiple contents = total number of response contents) and 3) determinant Complexity (single Form = 0; single not-Form = 1; multiple = total number of determinants of the response). The sum of this calculation for all protocol responses constitutes the *Complexity* variable, which has already been evaluated in previous studies using eye-tracking (Ales et al., 2020) and functional magnetic resonance imaging (Vitolo et al., 2020).

Results

Codification concordance results with external judges showed excellent indexes, providing great credibility to the values found in this study: Location (W, D, Dd, S) = 0.96; Developmental Quality (DQ+, DQo, DQv/+, DQv) = 0.92; Determinants (14 variables) = 0.92; Formal Quality (FQ+, FQo, FQu, FQ-) = 0.80; Pair = 0.87; Contents (25 variables) = 0.90; Special Scores = 0.86; P = 0.88 and Z Score ICC = 0.86.

Between-group comparisons of demographic characteristics can be seen in Table 1. Although age, sex, and socioeconomic level did not differ between groups, the variable 'years of study' was significantly different among groups (p -value < 0.001). Therefore, subsequent comparisons with the mixed models considered years of schooling as a covariate.

Table 1
Demographic results of between-group comparisons

Demographic variables	Public Schools (N = 49)		Private Schools (N = 69)		t / χ^2	p-value
	M / Frequency	SD / %	M / Frequency	SD / %		
Sex						
Female	28	57%	36	52%	0.285	0.593
Male	21	43%	33	48%		
Age	15.5	1.2	15.8	1.2	1.755	0.082
Years of study	8.9	1.1	9.7	1.1	3.549	< 0.001
Socioeconomic Level						
A	13	27%	27	39%		
B	32	65%	41	59%		
C	1	2%	0	0%	5.099	0.277
D	2	4%	1	1%		
E	1	2%	0	0%		

The mixed model comparisons with Rorschach scores as dependent variables (controlled by gender, years of study, and evaluator) indicated that participants from private schools had higher mean values of total responses (R) to the protocol ($p = 0.015$, $d = 0.47$) and more complex protocols (*Complexity*; $p = 0.007$, $d = 0.53$). This intermediate effect size value (0.53) reinforces the magnitude of the difference between groups: students from private schools presented a higher mean value in this variable, indicating greater cognitive flexibility and a higher level of sophistication in their answers. This is equivalent to the interpretation that these students could be more successful in responding to the demands, investing more energy and cognitive resources to overcome the challenges.

In addition, three variables presented a tendency toward significance after correcting for multiple comparisons: the proportion of distorted formal quality responses (X-%), higher in private schools; the proportion of unusual formal quality responses (Xu%), higher in public schools and the experience actual (EA) variable, obtained through the sum of human movement responses with the weighted sum of color responses, higher in private schools (Table 2).

As the groups differed in *Complexity*, this variable was also inserted in the mixed model (as a fixed effect) in a later exploratory analysis. This analysis revealed a significant difference in Xu% ($p = 0.008$, $d = -0.52$) and a trend towards significance for X-% ($p = 0.029$, $d = 0.43$). Finally, another trend towards significance was also observed in the Depression Index (DEPI): students from public schools had higher values related to emotional distress than their peers from private schools ($p = 0.035$; $d = -0.41$).

Table 2
Between-group results of the selected variables*

Sections/ modules	Dependent Variable	Public School (N = 49)		Private School (N = 69)		p-value	Cohen's d
		M	SD	M	SD		
Main Section responsiveness engagement	R	20.33	4.59	23.68	8.58	0.015	0.47
	F%	0.47	0.19	0.43	0.16	0.097	-0.32
	Complexity	56.80	18.77	68.65	26.42	0.007	0.53
Information processing section	Zf	9.86	4.15	11.4	4.36	0.111	0.31
	Zd	-0.79	4.37	-0.54	4.21	0.586	0.11
	W	7.04	3.34	7.97	3.61	0.396	0.16
	D	9.65	3.52	11.46	6.15	0.027	0.43
	Dd	3.63	3.08	4.26	4.09	0.564	0.11
	DQ+	4.37	3.24	5.32	3.27	0.122	0.30
	DQv	0.96	1.21	0.74	1.07	0.688	-0.08
Cognitive mediation section	P	3.94	1.70	4.48	2.06	0.132	0.29
	XA%	0.79	0.10	0.77	0.11	0.024	-0.44
	X-%	0.19	0.10	0.22	0.11	0.017	0.47
	Xu%	0.33	0.13	0.30	0.13	0.016	-0.47
	X+%	0.46	0.14	0.47	0.15	0.573	0.11
Ideaction section	M	2.76	2.34	3.51	2.23	0.096	0.32
	FM+m	4.26	3.17	5.14	3.15	0.072	0.35
	a-p	-1.06	3.37	0.45	3.77	0.391	0.17
	WSum6	9.12	6.21	9.07	8.46	0.489	0.13
	Lvl2	0.55	0.68	0.45	0.85	0.784	-0.05
	MOR	1.33	1.40	1.33	1.51	0.516	0.13
	Control and stress tolerance section	EA	5.12	3.16	6.60	3.66	0.021
Es		7.14	5.08	8.78	4.51	0.048	0.38
D score		-0.67	1.84	-0.61	1.45	0.987	-0.01
Adjusted D		-0.29	1.50	-0.06	1.15	0.427	0.15
Affective features section	Afr	0.57	0.23	0.57	0.19	0.443	0.15
	WSumC	2.37	1.90	3.09	2.19	0.048	0.39
	FC-(CF+C)	2.71	2.03	3.90	2.79	0.290	0.21
	Shading sum	2.88	3.34	3.84	3.17	0.216	0.24
	Texture sum	0.33	0.80	0.35	0.64	0.809	0.05
Self-perception section	Ego	0.33	0.15	0.33	0.14	0.657	0.09
	Pair	5.61	3.03	6.64	3.56	0.089	0.33
	FD	0.61	0.79	0.91	0.94	0.092	0.33
Interpersonal perception section	GHR	2.94	1.81	3.30	2.32	0.508	0.13
	PHR	3.26	2.28	3.25	2.38	0.781	0.07
	H+(H)+Hd+(Hd)	5.69	2.91	6.04	3.29	0.442	0.15
	H-[(H)+Hd+(Hd)]	-1.08	3.55	-1.22	2.72	0.902	-0.02
	Indexes	CDI	3.37	1.03	3.09	1.28	0.111
DEPI		3.98	1.20	3.62	1.40	0.121	-0.30
HVI		2.69	1.56	3.04	1.78	0.299	0.20
PTI		0.63	0.95	0.77	1.15	0.385	0.16
EII-2		0.05	0.76	0.09	1.00	0.274	0.21
DI		16.41	3.21	17.13	2.88	0.227	0.23

Note: *R: responses; F%: pure form percentage; Zf: Z frequency; Zd: difference between obtained and expected Z; W: global responses; D: common detail; Dd: uncommon detail; DQ+: synthesized developmental quality; v: vague developmental quality; P: popular responses; XA%: percentage of ordinary and unusual responses; X-%: percentage of minus responses (distorted); Xu%: percentage of unusual responses; X+%: percentage of ordinary and elaborated responses; M: human movement; FM+m: sum of animal and inanimate objects movements; a-p: active-passive; WSum6: weighted sum of 6 critical special scores; Lvl2: Level 2 special codes; MOR: Morbid Content; EA: Experience Actual; es: Experienced Stimulation; Afr: Affective Ratio; WSumC: Weighted Sum Of Color; FC-(CF+C): Emotional Expression; Ego: Egocentricity Index; FD: Form Dimension; GHR: Good Human Representational Responses; PHR: Poor Human Representational Responses; H+(H)+Hd+(Hd) and H-[(H)+Hd+(Hd)]: Interpersonal Interest. The indexes: CDI: Coping Deficit Index; DEPI: Depression Index; HVI: Hypervigilance Index; PTI: Perceptual Thinking Index; EII-2: Ego Impairment Index; DI: Developmental Index. M: Mean; SD: Standard Deviation. In bold, the p-values that survived correction by multiple comparisons (inside each section/module).

Discussion

Although the present study found positive results in the between-group comparison, which survived multiple comparison corrections, the reduced number of significant differences found is noteworthy. This indicates that, despite all the previously mentioned differences in the quality of different types of educational systems (public and private), the groups are not so different in the Rorschach variables.

It is important to note that, although *Complexity* is associated with age, education, intelligence, and environment adaptation (Meyer et al., 2017), it does not necessarily indicate more success in translating information about oneself (mediation) and reality, and it does not influence the way people think about their experiences (ideation). This variable, by itself, also does not indicate that the person has a better adaptation to life in general. For example, in disturbed people, high values of *Complexity* may indicate confusion, difficulties in psychological limits, overload of ideas, and insufficient emotional control. On the other hand, in protocols of people who do not show signs of psychological disturbance, this variable may indicate sophisticated processing, good productivity, psychological resources, and good environmental adjustment.

Since we had a low incidence of pathological signs in both groups, we can say that they did not differ in this sense. This leads us to conclude that, for most students with high results in *Complexity*, these indicate positive cognitive resources independently of the educational system. The expected average in adult non-patient populations is 68.01 (non-optimized original data, Meyer et al., 2017), exactly the same value found in the private school sample. However, the average for public schools was 56.8, below what was expected, possibly indicating both a constraint in cognitive processing (greater rigidity, as already mentioned above) or a greater limitation in responsiveness to stimuli.

It is difficult to determine whether this difference is due only to the type of school administration or other variables, such as cultural background or interest in performing the task. However, similar results were also found in Brazilian studies that used the Paris School system (Cury-Jacquemin et al., 2012; Jardim-Maran et al., 2015). Although the coding system is different, some variables indicate similar psychological characteristics: the differences found in these studies were mainly related to Form responses (F%), one of the components of the Complexity Index. Therefore, it is not impossible that, if there were an analysis considering the grouping of *Complexity* variables in these studies, it could also show differences between schools' systems.

Three other variables showed a tendency towards significance in relation to the school administration: X-%, Xu%, and EA. This latter result deserves attention: even not surviving the threshold for multiple comparisons after controlling for *Complexity*, the EA results indicate that private school students could have more resources to respond to the demands of the environment deliberately. These findings corroborate previous results presented by Ribeiro et al. (2011), in a study with children, that showed higher resources in how students from private schools responded to the task, although they also showed an increase in anxiety. On the other hand, in the present study, no differences were found in the manifestation of anxiety, as indicated by the variables of the Rorschach method.

Regarding the percentages of distorted and unusual Form, an opposite pattern was found between schools: while adolescents from private schools presented a higher average of X-%, those from public schools had a higher average of Xu%. When we controlled the mixed models for *Complexity*, the X-% remained a trend, while the Xu% reached the criterion for statistical significance controlled by multiple comparisons, reinforcing the significance of the finding. The increase in X-% among students from private schools is surprising, as the variable did not show differences between sociocultural groups in the normative survey of adults in São Paulo. However, São Paulo participants showed higher X-% results than those from the state countryside (Nascimento, 2010). A possible interpretation of these results is that they do not represent a sign of pathology but could indicate a more idiosyncratic interpretation of the situations. At the same time, public school students show their subjectivity in interpretation without despising reality, which was observed in responses of unusual formal quality (Xu%).

About DEPI results, if only the averages were considered, we would not have much to comment on the observed trend, as both groups presented similar results: none of the groups reached a mean value of 5 (when the index is positive), which would be indicative of difficulties in the affective sphere. Nevertheless, a more detailed analysis of the number of students who presented positive DEPI revealed that 19 participants from public schools (39% of the total) had a positive index, while 20 young people from private schools (29% of the total) presented this sign of psychic suffering. It is important to emphasize that these values do not necessarily indicate cases of depression as a clinical condition. However, considering the economic difficulties and the prospects for the future that they may have, life is (and might be, in the future) more difficult for the public system students, which may have played a role in this result. For this reason, they may be more disenchanted and have less hope for their future when compared to private school students. On the other hand, when observing the high frequency of DEPI in both groups, we also have to consider that, in many cases, adolescence itself can contribute to the appearance of distress.

No differences were found in the remaining indexes studied. The results of the perception and thinking index (PTI) and ego impairment index (EII-2) did not show evidence of more severe pathologies or any evidence of differences in psychological maturity (DI) between groups. Despite the high level of positive cases in the coping deficit index (CDI): 28 (41%) for private schools and 28 (57%) for public schools, both groups seem to face the challenges of social situations similarly, with an average within the expected standards for adults (3.47) according to the SC (Nascimento, 2010). It can be stated, therefore, that the Rorschach method does not tend to present pathologies in people, as is often stated: despite having some indicators of psychological distress, these adolescents generally did not show signs that would reflect serious mental disorders. A more specific analysis related to specific disorders of adolescence has already been explored with this database and can be found in Nascimento (2015) and Nascimento et al. (2017).

A final consideration highlights that comparative studies between public and private school students are only reported in Brazil. What seems not to be an issue for other countries has been a major concern in our culture, given the enormous inequality in school performance indicators (*Prova Brasil*, SAEB, IDEB). These data raise concerns about their effect on the psychological assessment results. Despite the disparity in performance evaluated by these tests, in which public school students show more difficulties, we can postulate that these results only partially interfere with the Rorschach results: as previously mentioned, an important interference is expressed in the *Complexity* results. This brings into question the importance of the quality of Brazilian public education: in addition to worse academic performance (evidenced by the exams and tests), those youth also presented an impoverished way of responding to demands. This could make the academic development progress of these individuals and their entrance into the job market even more challenging, possibly leading to difficulties in accessing more competitive positions, with greater cognitive demand. In this sense, we can say that our results may reflect what has been systematically found in the results of exams evaluating the academic performance of Brazilians. This same scenario was found in Rorschach studies by Ribeiro et al. (2011), Cury-Jacquemin et al. (2012), and Jardim-Maran et al. (2015), which strongly indicates that the conditions that led to the results obtained in the national schooling tests are also being reflected in the Rorschach results.

Like Cury-Jacquemin et al. (2012), we consider that the evidence is still rare and inconsistent, which would not justify the existence of specific normative tables for each educational system. In any case, for the purpose of understanding the dissimilarities, a table with separate means and standard deviations for each type of school has already been published (Nascimento et al., 2017).

Even so, in the same way as the above-mentioned authors, we consider that when evaluating people in the clinic or in other situations in which the Rorschach method is used, a careful look at the issue of the school system is essential.

On the other hand, the present research also showed many similarities between the groups, which can be understood as a positive fact, once the differences are not so ubiquitous. These similarities can occur for a few reasons. First, the question regarding the city in which this research was conducted: according to Casassus (2007), the results of school exams present better performances in cities with more than one million inhabitants. This indicates that adolescents from São Paulo probably have better academic performance, even considering the school administration type (public or private). In addition, it should be noted that, although there are still inequalities between both school types, these tend to be smaller for two reasons: the level of public schools in São Paulo and the permanence of the youth in school. The longer the schooling time, the smaller the differences between the participants of the two education segments: this data is confirmed by the CDES report, in which differences in students' grades can be observed, with the best performance registered in the South and Southeast regions. In this way, the present sample may be characterized by higher performance, considering the public segment of education, which also may impact this research results.

As the Rorschach is a test for assessing the structure and dynamics of personality, we found that this test does not present divergences in most of its variables when considering the type of school administration. This shows that it is possible to have a single Rorschach standardization for youths, integrating both groups. Furthermore, it should be noted that in the present study there was a significant difference between the groups in terms of studied years, which could have influenced the results. Interestingly, there was no such difference between the groups when considering volunteers' ages: our hypothesis is that age was measured with a precision of days, whereas the variable studied years was evaluated using years as the measurement unit. When performing the age analysis using year as the unit, we also observed this trend of older students in private schools, which is evidence for the unit-problem hypothesis. Because of this fact, all analyses presented were controlled by years of schooling.

Other studies also found the same pattern (of differences in a few variables) on this topic in our culture (Cury-Jacquemin et al., 2012; Jardim-Maran et al., 2015; Ribeiro et al., 2011). Despite the few differences, the results indicate a tendency towards a more productive and elaborate performance among private school students, who present more resources to face difficult situations. It is possible that this result reflects the opportunities they were given in their lives. This leads us to agree with the proposals of the official educational reports mentioned above, mainly with two concerns regarding the students: youth access to school and non-evasion. We believe that the differences between the two groups may have been attenuated by the sample being predominantly from high school, that is, students with more years of schooling.

It is important to consider the study's limitations. First, the assessments covered a relatively small universe of students in São Paulo to be taken as definitive conclusions. Therefore, expanding the study and including other regions with a greater diversity of public and private schools would be necessary. A second limitation was that adolescents from private schools had studied for more years according to our unit measurement, which could have been an interference factor for the results, especially in the *Complexity* variable. However, all statistical analyses considered the number of studied years, which means this factor was controlled. That is, if there was a difference in the *Complexity* variable exclusively due to the number of studied years, the groups would not

differ due to the statistical model used. Thirdly, this study followed Exner's Comprehensive System methodology: although there are similarities between this method and the R-PAS in many of the relevant variables for interpretation, *Complexity* is a variable that proved to be different among systems precisely because it depends on the number of responses offered in each protocol (Pianowski et al., 2021). Despite that, a recent meta-analysis argued that it is possible that data obtained with SC can be generalized to R-PAS (Hosseinasab et al., 2019).

Final Considerations

This research goal was not to evaluate the quality of education but to know how much the teaching modality could interfere with the Rorschach results. The fact that the results were quite similar between the groups can lead to two conclusions: either teaching is very similar in both school segments, or the quality of teaching interferes with a few of Rorschach's variables. Both hypotheses may be relevant, but we consider the second most likely. Also, it should be noted that the Rorschach method is an instrument for assessing personality characteristics, and the SC is a valid system, but it does not have many reviews and meta-analyses in the literature. In turn, some of these characteristics (perhaps most of them) are independent of school preparation. However, although few differences were found, this study showed that the Rorschach results could reflect some consequences of people's experiences. Thus, it is important to consider these data when analyzing the individual Rorschach protocols.

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Contributors

R. NASCIMENTO (*in memoriam*) participated in the study design, recruitment of financial resources, coordination of data collection, supervision of corrections, analysis planning, and article writing. M. BATISTUZZO participated in data collection and correction of protocols, performed the data analysis, writing and reviewed the article.