

Rorschach test in murderers: a systematic review of the literature 1946-2021 - III – case control groups comparative studies: murderers versus suicides and versus normal controls

Salvatore Zizolfi | Ignazio Grattagliano | Daniele Zizolfi | Stefania Zecca | Pasqua Loconsole |
Luciana Prudente | Antonia Valerio | Roberto Catanesi



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Corresponding Author: Ignazio Grattagliano,
e-mail: ignazio.grattagliano@uniba.it

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Abstract

A total of 91 studies on Rorschach test in murderers from 1946 to 2021, written in English (62), French (13), Italian (12) or other languages (N = 4; Portuguese, Spanish and German) were reviewed, searched from the main databases (PubMed, Medline Complete, Embase, PsycINFO, PsycNET, PEPWeb, Cochrane, Gallica and Perseus) and other relevant sources (Google scholar; books and journals in the Rorschach field; Rorschach bibliographies; Buros MMY Mental Measurement Yearbooks), as well as from researcher networks (academia.edu, researchgate.net) and from the list of references of identified articles. Literature searching, study selection, screening and data extraction were carried out independently and concordantly by two authors. All the papers containing data on the Rorschach test in murderers were included, but only the contributions whose full text pdf was available were considered. Five types of studies were identified: 1) Literature reviews (N = 4); 2) Single case studies (N = 31); 3) Descriptive studies on murderer samples without controls (N = 20) or compared with normative data (N = 2); 4) Case-Control groups comparative studies (N = 28); 5) Miscellanea (N = 6). All the studies have been summarized in detail, so as to almost always replace a direct reading. The present paper concerns two subgroups of case control groups comparative studies, respectively comparing murderers with normal controls (N = 8), and murderers with suicides and attempted suicides (N = 3). The results are extensively discussed, focusing on forensic implications and indications for future research.

Keywords: Homicide, Murder, Murderer, Rorschach test.

Salvatore Zizolfi, Psychiatrist, IPA Psychoanalyst, Ordinary Member of SSPa Swiss Society of Psychoanalysis, Member of SRR Scuola Romana Rorschach, Member of SPA Society of Personality Assessment, Como | **Ignazio Grattagliano**, Department of Education, Psychology and Communication Sciences, University of Bari, Aldo Moro | **Daniele Zizolfi**, Psychiatrist, Psychotherapist, Member of SRR Scuola Romana Rorschach, Como | **Stefania Zecca**, Forensic Psychologist, Expert in Rorschach Psychodiagnostics (Comprehensive System), Lecce | **Pasqua Loconsole**, Director of the Libraries of the Medical-Veterinary Center, University of Bari, Aldo Moro | **Luciana Prudente**, Department of Education, Psychology and Communication Sciences, University of Bari, Aldo Moro | **Antonia Valerio**, Interdisciplinary Department of Medicine, Section of Clinical Criminology and Forensic Psychopathology, University of Bari, Aldo Moro | **Roberto Catanesi**, Interdisciplinary Department of Medicine, Section of Clinical Criminology and Forensic Psychopathology, University of Bari, Aldo Moro.

Rorschach test in murderers: a systematic review of the literature 1946-2021 - III – case control groups comparative studies: murderers versus suicides and versus normal controls

Introduction

The psychological and psychiatric assessment of authors of homicide is of paramount relevance in the forensic practice, in order to address issues of competence to stand trial, mental state at the time of offense and current dangerousness, according to the principles of EBMPA (Evidence Based Multimethod Psychological Assessment) (Erard & Evans, 2017; Giromini & Zennaro, 2019), (Grattagliano et al., 2019; Grattagliano et al., 2019). In this field, the Rorschach test, blowing out its first hundred candles since the publication of Psychodiagnostic (1921, 1942, 1981), the masterpiece of Herman Rorschach (1884-1922), confirmed itself until to-day as the longest-lived and one of the most used psychodiagnostic tests, both in clinical and forensic psychological and psychiatric practice (Archer, Buffington-Vollum, Vauter Stredny, & Handel, 2006; Archer & Wheeler, 2013; Giromini & Zennaro, 2019; Giromini et al., 2022; Hinselroth & Strycker, 2004; Neal & Grisso, 2014). In addition, in the last decade, despite some recent criticism (Areh, Verkanpt, & Allan, 2021), the outstanding metanalysis by Mihura, Meyer, Dumitrascu & Bombel (2013), completed the work of refoundation of the psychometric bases of the Rorschach, convincing the most bitter opponents of the first hour (Wood, Garb, Nezworski, Lilienfeld & Duke, 2015) and almost putting an end to the so-called 'Rorschach controversy' (Zizolfi, 2016); as a consequence, the Rorschach test is not challenged at unusually high rates, when compared to other psychological tests, in the United States and in selected European courts (Viglione, et al., 2022). It is therefore of the greatest interest to analyze the literature on the Rorschach test in murderers, along a systematic all-inclusive comprehensive review, with the aid of electronic databases, which allows us to identify a much larger number of studies (N = 91) than in previous reviews (Cimino, 2018a; Ferracuti, 1961; Frank, 1994; Gambineri, 2004a). The following paper refers expressly to our first contribution about this issue (Zizolfi, et al., 2023a); for further details, the first work is an indispensable reading and a pivotal element also as regards the aims, the rationale and the methods used. Five types of papers were identified: 1) Literature reviews (N = 4); 2) Single case studies, without (N = 10) or with (N = 21) Rorschach record; 3) Descriptive studies on murderer samples without controls (N = 20) or compared with normative data (N = 2); 4) Case-Control group comparative studies (N = 28); 5) Miscellanea (N = 6). For each of these five categories, every paper is described in chronological order, resuming all the major details, with frequent citations (in italics), aiming to replace, as far as

possible, the reading of the full text: anyway, the interested reader may always request the original pdf to the first author¹. In the first contribution (Zizolfi, et al., 2023a), we presented single case studies (10 without Rorschach protocol and 21 reporting Rorschach record) and miscellaneous studies (N = 6). The second contribution (Zizolfi, et al., 2023b), concerns descriptive studies without controls, including murderer samples without controls (N = 20) or compared with normative data (N = 2).

The present third contribution considers two subgroups of case control groups comparative studies, i.e. studies comparing murderers with suicides and attempted suicides (N = 3) and papers comparing murderers with normal controls (N = 8).

Methods

In order to obtain a comprehensive and inclusive literature review, all articles mentioning the Rorschach test in murderers were included without any language filter: search strategy, eligibility and exclusion criteria, and data extraction are fully detailed in our first contribution (Zizolfi, et al., 2023a). Briefly, only full text contributions were considered; two reviewers extracted the different data independently from each other; if the systematic review process lacked consensus between the two, they discussed between them to solve the disagreement, or, otherwise, a third reviewer resolved it. 103 papers were identified, 91 articles entered the study²: paper by Ermentini (1990) and eleven papers presenting Rorschach data from mixed criminals (not only murderers) were excluded (Dorr & Viani, 2006; Franks, Sreenivasan, Spray & Kirkish, 2009; Keltikangas-Jarvinen, 1978; Norbeck, Gronnerod, & Hartmann, 2016; Parrot & Brigue-Lamarre, 1965; Rader, 1957; Schachter, 1975; Timsit & Bastin, 1987; Walters, 1953; Weizmann-Henelius, 2005 and 2006)³.

Results

The present third section of our review concerns two subgroups of case-control group comparative studies, comparing:

- 1 e-mail: zizolfi@iol.it
- 2 A pdf copy of each analyzed article is available upon request to the first author (S.Z.), e-mail: zizolfi@iol.it
- 3 A pdf copy of each excluded article is available too, upon request to the first author (S.Z.), e-mail: zizolfi@iol.it

- murderers with suicides and attempted suicides (N = 3);
- murderers with normal controls (N = 8).

Comparison between murderers, suicides and attempted suicides (N = 3)

From 1972 to 1977, Lester had been repeatedly exploring the field of Rorschach test in murderers, according to the Beck method (1944).

Lester & Perdue (1972) scored protocols of 50 convicted murderers and found a color-shading response, in only 8%: a much lower frequency than that evidenced by Appelbaum and Colson (1968) in the records of 90% of completed suicides, 85% of attempted suicides, 49% of psychiatric controls and 19% of normal control. The results confirmed color-shading response as an index of inward directed aggression, but cross validation is still needed.

Lester & Perdue (1974a), in order to distinguish murderers from attempted suicides, examined the Rorschach records of 72 male hospitalized patients with attempted suicides studied by Martin (1951) and those of a group of 50 male murderers and sentenced from 10 years to life imprisonment (some sentenced to death), matched for age and total number of Rorschach responses, tested by different psychologists. The two groups were compared as regards the presence of the 17 signs identified by Martin (l.c.) as characteristics of attempted suicides, much more frequent than in normal controls. No difference was found for the total number of Martin's signs between murderers (mean: 9.4, SD: 2.6) and attempted suicides (mean: 9.0, SD: 2.6). Four signs, more frequent in murderers, were found to differentiate significantly (chi square) between the two groups: 1) C and/or CF responses occur with zero (FY+YF+Y) ($p < 0.01$); 2) Total shading responses < 1 ($p < 0.001$); 3) Number (FY+YF+Y) < 1 ($p < 0.001$); 4) F+% > 85 ($p < 0.001$). One sign (P Failure with F+% > 60) was less frequent in murderers ($p < 0.001$). These results suggest that "... *Martin's signs may not be predicting suicidal behavior per se, but rather general aggressive acting-out*".

Lester & Perdue (1974b), in order to distinguish murderers from attempted suicides, re-examined the same group of 50 male murderers and sentenced from 10 years to life imprisonment (some sentenced to death), and a group of 43 subjects (16 males and 27 females) tested after a suicide attempt in a psychiatric hospital, matched for age, with different psychiatric diagnoses (40% with psychosis, 25% with character disorders, and 35% with psychoneurosis) (diagnoses were not made on the murderers at the state penitentiary). Using Fisher and Cleveland (1968) barrier and penetration scoring system, murderers gave significantly (Student two-tailed t test) fewer total Rorschach responses than psychiatric patients (19.1 vs 25.4; $p < 0.01$), fewer barrier responses (1.9 versus 4.8; $p < 0.001$) and fewer penetration responses (0.8 versus 2.3; $p < 0.001$). In order to control for differences in the total number of responses, proportion scores were computed

for each subject. Murderers had significantly lower barrier responses per cent (0.09 versus 0.17; $p < 0.001$) and lower penetration responses per cent (0.04 versus 0.10; $p < 0.001$).

Comparison between murderers and normal controls (N = 8)

Endara (1960) studied the Rorschach records (not specified method) in four groups of subjects, aged 18-45, with no psychiatric history and no sign of mental illness: 40 thefts, 40 occasional homicides, 40 repeat homicides, 40 normal controls with no criminal history. According to Orr (1958), he searched for 11 types of responses in the I and the VII tables of the Rorschach test (so called 'mother tables'), suggesting a conflictual relationship with the maternal imago: H (Human seen without movement), FK (or FM) (animal seen in quasi-human movement), Warm-blooded Animals, Cold-blooded Animals, Botanical, Social animals and Animals without sex, Quasi-human Objects, Mineral residues of bodies or organs and parts of the body (Devitalized and degraded human responses), Mountains, Geographicals, Stones. Occasional murderers and repeat killers, when compared with theft and normal controls, showed a lower % frequency of human responses (Table I: 6.5 – 13.0 – 18.9 – 25.0; Table VII: 2.0 – 4.0 – 20.8 – 16.5) and a higher % frequency of devitalized and degraded human responses (Table I: 30.0 – 15.0 – 7.7 – 14.0; Table VII: 10.0 – 27.0 – 9.0 – 6.2).

In Author's view, these data should suggest a marked difficulty in human relationship in criminals as a result of deficient primary relationship with maternal imago.

Tsuboi & Takemura (1960) administered the Rorschach test (not specified method) in 30 out of 73 male prisoners for parricide and/or matricide (28 parricides, 24 matricides, 6 both, 15 others: father-in-law and so on). Murderers group, when compared with 30 normal controls (no statistical method specified) showed lower mean values as regard R (18.7 vs 25.9), M (2.0 vs 3.1), FC (0.8 vs 2.7), and A% (41.9 vs 50.4), and higher mean values for Rejection (0.82 vs 0.2), F% (57.8 vs 43.8), C (0.5 vs 0.1) and Ad% (6.9 vs 3.4).

Bukowski & Gehrke (1979) compared the Rorschach records of 20 male murderer inpatients in a forensic psychiatric hospital in Brazil with those of 20 normal healthy controls (not specifying Rorschach method). Murderers' Rorschach displayed: higher F% ($p < 0.05$), "... *indicative of severity and exigency of environment*"; lower determinants FK+M+FC+FC', suggesting poor "... *insight capacity and power of atonement*" ($p < 0.01$); higher frequency of sadistic contents (such as organ mutilations and parts) ($p < 0.01$).

Gambineri (2004b) compared 20 male murderers (20-50 years old; mean = 29 years; 13 between 20 and 30 years, 4 between 30-40 years, 3 between 40 and 50 years), examined for forensic purposes, with 20 male normal controls (20-50 years old; with the same mean age and distribution), without any history of crimes and recruited on voluntary basis. Both murderers and controls were mentally sane and were administered the Rorschach test

for the first time, according to SRR (Giambelluca, Parisi & Pes, 1995; Parisi & Pes, 1990a, 1990b, 2010). The results were statistically analyzed by means of Mann-Whitney U test; SRR normative values were considered, too (Giambelluca, Parisi & Pes, 1995; Parisi & Pes, 1990a). The following quantitative variables were reported for each murderer test: R, R+%, R+-%, F%, F+%, F+-%, V%, O%, O+%, Comprehension mode, G/M ratio, T.V.I., t.v.i., Autocontrol Index, Affectivity Index, Impulsivity Index, Reality Index. Mean values were considered for the following quantitative variables: R, R+, F+, G, G%, D, D%, Dd, Dd%, Dim, Dim%, FC, FC%, CF, CF%, O, O%, O+, O+%, O+-%, O-, H+Hd, A+Ad. When compared to minimum and maximum normative values (Giambelluca, Parisi & Pes, 1995; Parisi & Pes, 1990a), murderers show a trend toward low R (range: 7-43; < 20 in 16/20), low R+% (range: 50-93; < 70 in 11/20), high R+-% (range: 18-75; > 30 in 11/20), high F% (range: 45-90; > 70 in 14/20), low F+% (range: 44-100; < 70 in 11/20), high F+-% (range: 0-44; > 30 in 6/20), high V% (range: 8-71; > 25 in 13/20), higher G/M ratio (> 3/1 in 16/20) because of low M (absent in 10/20; < 2 in 13/20). Anyway, no statistically significant difference was found between murderers (first number in brackets) and the control group as regards mean values of R (18 vs 24), R+ (11 vs 15), F+ (9.7 vs 15), G (8.4 vs 8.2), G% (53.0 vs 45.0), D (8.5 vs 9.4), D% (40.5 vs 47.5), Dd (0.7 vs 1.6), Dd% (2.1 vs 3.8), Dim (0.6 vs 1.1), Dim% (3.0 vs 4.3), FC (1.3 vs 1.6), FC% (11.3 vs 9.0), CF (1.4 vs 1.1), CF% (8.0 vs 5.7), O (5.0 vs 3.0), O+ (1.4 vs 0.8), O+% (27.2 vs 28.5), O+-% (1.4 vs 0.7), O- (2.9 vs 1.9). Only mean O% was significantly higher in murderers than in control group (23.7 vs 13.0; U = 108.5, Z = -2.476; p < 0.02), while mean A+Ad was significantly lower than in control group (7 vs 11; U = 127, Z = -1.98; p < 0.05). When compared to normative values (Giambelluca, Parisi & Pes, 1995; Parisi & Pes, 1990a), the Affectivity Index is lower (range: 14-40; < 35 in 12/20), as well as the Reality Index (range: 0-8; < 5 in 12/20); the Impulsivity Index is higher (range: 0.36-2.00; > 0.60 in 13/20, > 0.90 in 8/20). The paper reported also some other interesting qualitative observations about contents, chocs and verbalizations.

Cimino, De Ronchi & Atti (2012), in their first preliminary contribution, administered the Rorschach test, for forensic purposes, through the method of SRR (Scuola Romana Rorschach), processing the information by means of RORCOMP (Parisi, & Pes, 1990b, 2003), in 20 male subjects, authors of murders, aged 20-50, and in 20 male normal controls, without any history of crimes. In murderer sample, the number of responses was lower than average (R = 20 in 80% of subjects), as well as the number of M (M < 2 in 75% of subjects), while extratensive TVI and affectivity type CF+C > FC were more frequent, and the Impulsivity Index was higher (I.I. = 0.85 in 78% of subjects). From the cognitive point of view, there were no significant differences concerning the sense of reality between the murderers and control samples (R+% and F+%: 70-80). According to these Authors: "...

the Rorschach indices, in concordance with literature data, showed in the murderers the presence of affective lability and immature object relations, lack of interest in the object, impulsivity, egotism and mild empathy, that identify the cluster B personality traits".

Cimino, Atti & De Ronchi (2013), in their second pilot study, administered the Rorschach test, for forensic purposes, through the method of SRR (Scuola Romana Rorschach), in 15 male subjects, authors of murders with the characteristics of 'crime of impetus', aged 22-60 (mean age: 43.2, SD = 10.96), without any previous psychiatric disorders, and in 15 male normal controls, without any history of crimes. Data were statistically analyzed by means of Student two tailed t test. Murderers sample showed no difference concerning cognitive functions and sense of reality (R+% = 75.87 vs 70.73, N.S.; F+% = 75.47 vs 76.93, N.S.) but a statistically significant lower number of responses (16.67 vs 25.27, p < 0.0001), lower G (7.73 vs 9.35, p < 0.005), higher M (2.37 vs 1.00, p < 0.0001) and higher Impulsivity Index (0.96 vs 0.33, p < 0.0005). These Authors stated in their conclusions: "*According to the most recent literature, the Rorschach indices showed in the perpetrators of the 'crime of impetus' the absence of mental disorders; however, the disproportion of the Index G/M and Impulsivity Index may indicate a 'vulnerable anthropology' as a risk factor for impulsive crime in the presence of emotional stress*".

Cimino, in his extensive monograph (2018) on the 'Crime of impetus' (180 pp), devotes ample space to the Rorschach test. After reviewing the international literature on the Rorschach in murderers (Cimino, 2018a), he showed the results obtained in two groups of subjects (2018b, 2018c), administered the Rorschach test according to the SRR (Scuola Romana Rorschach) (Cicioni, 2016; Rizzo, Parisi, & Pes, 1980; Parisi, & Pes, 1990a, 1990b, 2003, 2010), in a forensic setting. 15 impetus murderers (12 males, 3 females), aged 22-60 (mean: 43.2, SD: 10.96), without any personal and familiar psychiatric history and with no previous crimes were compared with 15 normal controls sex and age matched (12 males, 3 females; aged 22-56, mean: 41.4, SD: 10.00). No subject was previously tested with the Rorschach test. SRR normative data for normal population were also used for comparison (Cicioni, 2016; Giambelluca, Parisi & Pes, 1995; Parisi & Pes, 1990a). The results were statistically analyzed with SPSS (Statistical Package for Social Science, Version 15.0), by means of Student two-tailed t test and by means of chi square test and multivariate logistic regression analysis. For each murderer and control Rorschach test, the following indices were reported (Cimino, 2018c): R, R+%, F+%, R+-%, F+-%, F%, V%, O%, O+%, GO+%, H%, G/M. For the same variables, mean, SD, median and mode in the two groups were calculated. Mean values for G, M, Impulsivity Index, Affectivity Index and AutoControl Index were considered, too. For each murderer, full picture of SRR 'Cognitive Area' and 'Affective Area' was showed. Some other interesting qualitative observations about contents, chocs and verbalizations are reported.

When compared to minimum and maximum normative values (Giambelluca, Parisi & Pes, 1995; Parisi & Pes, 1990a), murderers show a trend toward low R+% (range: 31-86; <70 in 5/15), high R+-% (range: 7-50; >30 in 6/15), high F% (range: 46-93; >70 in 8/15), low F+% (range: 57-100; <70 in 5/15), high F+-% (range: 0-56; >30 in 5/15), high V% (range: 17-65; >25 in 10/15), high H% (range: 0-46; <15 in 5/15), higher G/M ratio (>3/1 in 15/15), because of lower M (absent in 6/15; <2 in 9/15). Anyway, no statistically significant difference was found between murderers (first number in brackets) and the control group as regards R+% (mean: 70.73 vs 75.87; SD: 16.33 vs 2.95), R+-% (mean: 26.73 vs 23.07; SD: 11.62 vs 2.94), F% (mean: 70.07 vs 64.60; SD: 16.04 vs 3.40), F+% (mean: 76.93 vs 75.47; SD: 12.31 vs 2.33), F+-% (mean: 23.87 vs 23.27; SD: 16.17 vs 2.37). Murderer sample, as compared with control group, evidenced some statistically significant differences:

- lower R (range: 11-24 vs 19-33; mean: 16.67 vs 25.27; SD: 3.74 vs 4.13; $p < 0.0001$);
- higher V% (range: 17-65 vs 17-26; mean: 33.53 vs 22.27; SD: 13.69 vs 2.09; $p < 0.005$);
- higher O% (range: 5-78 vs 5-20; mean: 28.13 vs 11.20; SD: 17.72 vs 3.69; $p < 0.001$);
- lower O+-% (range: 14-70 vs 67-78; mean: 43.20 vs 72.60; SD: 17.59 vs 3.33; $p < 0.0001$);
- higher G (mean: 9.35 vs 7.37; $p < 0.005$);
- lower M (mean: 1.00 vs 2.87; $p < 0.0001$);
- higher Impulsivity Index (mean: 0.96 vs 0.33, $p < 0.001$);
- lower Affectivity Index 2 (mean: 25.40 vs 42.00, $p < 0.0001$).

According to these results, the Author confirmed the conclusions of Cimino, Atti & De Ronchi (2013): impetus murder is not related to mental disorder; the disproportion of the Index G/M (with higher G and lower M), and the high Impulsivity Index, clearly indicate a 'vulnerable anthropology' as a risk factor for impulsive crime in the presence of emotional stress.

Cicioni, Caravelli, D'Agata, & Della Vecchia (in press) retrospectively examined the Rorschach protocols administered according the SRR, between 2011 and 2021, for forensic purposes, during pre-trial examination in prison, in 85 male murderers (mean age: 37 years, SD: 13.8), legally sane, with no psychiatric history and without any psychiatric symptom and/or disease and/or diagnosis, not receiving psychopharmacological treatment. No one had committed murder on commission; 71/85 had killed only one victim, 14/85 more than one; 17/85 had killed their partner, 17/85 another member of their family (4/85: both parents; 3/85: their father; 2/85: their mother; 3/85: their sibling; 1/85: their mother and 1 sibling; 4/85: their child). In 51/85, the victim was out of the family. As control group, the Rorschach records of 85 males (mean age: 33; SD: 9.5) were randomly extracted from a list of 208 normal subjects, examined between 2011 and 2021 ac-

cording SRR, with no history of psychiatric symptoms or diagnosis, alcohol or drug abuse, psychotherapeutic treatment or taking psychotropic drugs. Most recent SRR normative values in normal controls (Cicioni, 2020) were considered, too. In this respect, the Authors remarked some changes, compared to previous normative values (Cicioni, 2016): normal mean value is now 0.60 for Impulsivity Index (previously: 0.35), and 3.5/1 for Autocontrol Index (previously: 2/1). The results were statistically analyzed by means of chi-square and Mann-Whitney U test. Murderers group, when compared with 85 normal controls, shows:

- lower R (mean: 17.3 vs 22.8; SD: 7.4 vs 13.2; $p < 0.02$);
- lower R+% (mean: 76.7 vs 81.6; SD: 12.8 vs 10.3; $p < 0.02$);
- lower M (mean: 1.4 vs 2.2; SD: 1.7 vs 2.1; $p < 0.006$);
- lower m (mean: 2.0 vs 3.3; SD: 2.1 vs 2.9; $p < 0.002$);
- lower H (mean: 2.2 vs 5.3; SD: 2.1 vs 4.1; $p < 0.001$);
- lower V (mean: 5.2 vs 5.9; SD: 1.9 vs 2.1; $p < 0.02$);
- lower R+% in black and white cards (mean: 79.0 vs 86.0; SD: 15.8 vs 10.2; $p < 0.007$);
- lower R+% in I-V cards (mean: 81.0 vs 85.1; SD: 13.2 vs 11.4; $p < 0.03$);
- lower R+% in VI-X cards (mean: 72.4 vs 78.8; SD: 19.1 vs 15.8; $p < 0.03$).

Impulsivity Index was higher in murderers, but the difference was not statistically significant (mean: 0.85 vs 0.72; SD: 0.54 vs 0.37; n.s.). Autocontrol Index in murderers was more frequently 'Labile' (54.1% vs 30.6%; $p < 0.001$) as well as Secondary Autocontrol Index (48.2 vs 27.1; $p < 0.02$). R+% is < 70.0 in 28/85 murderers and in 11/85 normal controls; in 19/85 murderers, R+% falls below 63.9%; in 18 out of these 19/85 murderers, the Autocontrol Index is 'Labile', indicating that some cognitive impairment is associated to affective lability. In murderers, t.v.i. is more frequently extratensive than in normal (50.6 % vs 25.9%; $p < 0.004$) and less frequently introversive (21.2% vs 34.1%) and ambiequal (25.9% vs 40.0%). No statistically significant difference was found as regards T.V.I. In murderers, extratensive T.V.I. and t.v.i. are most frequently associated with low Autocontrol index, confirming the tendency to a lower self-control. With regard to frequency of 'Manifestazioni Particolari (1st, 2nd, 3rd level)', no difference was evidenced between murderers and controls, perhaps because of the absence of psychiatric problems in the experimental group. With regard to content analysis, some remarks are noteworthy, such as the higher prevalence of female M (F/M = 28/23), the paucity of male H associated to M (3/22) in the IV table (so called 'father table'), the highest frequency of female M (5/22) in the VII card (so called 'mother table'). As a whole, these results confirm previous findings of the research in this field (Cimino, 2018a, 2018b, 2018c; Cimino, De Ronchi & Atti, 2012, 2013; Gambineri, 2004b), in a much larger sample group, according to a well- designed methodolog-

ical approach. Murderers show some cognitive impairment (lower R, lower R+%), reduced capacity for reflection, introspection and creativity (M, m), difficulties in interpersonal relationships (lower H), and marked difficulties in impulse control (Impulsivity Index, Autocontrol Index, Secondary Autocontrol Index).

Discussion

Comparison between murderers, suicides and attempted suicides (N = 3)

These three studies have been mentioned for the purpose of completeness of the present review, but they are mainly of historical interest, because of their great methodological limitations and the lack of confirmatory research. As a consequence, the results of these three studies, all using the Beck (1944) method, should be validated, according to flawless design, in order to verify:

- if colour-shading responses are less frequent in murderers' Rorschach, as suggested by Lester & Perdue (1972);
- if four Martin's signs (Martin, 1951), as reported by Lester & Perdue, 1974a, are more frequent in murderers' Rorschach, i.e.: 1) C and/or CF responses occur with zero (FY+YF+Y); 2) Total shading responses < 1; 3) Number (FY+YF+Y) < 1; 4) F+% > 85;
- if one Martin's sign (Martin, 1951), i.e. 'P Failure with F+% > 60', is less frequent in murderers' Rorschach, as evidenced by Lester & Perdue, 1974a;
- if, using Fisher and Cleveland (1968) barrier and penetration scoring system, murderers give significantly fewer total Rorschach responses, fewer barrier responses, fewer penetration responses, lower barrier responses per cent and lower penetration responses per cent (Lester & Perdue, 1974b).

Anyway, confirmatory research is made quite difficult by two major reasons: Beck (1944) method is out of use, and, unfortunately, we have not been able to find the original unpublished doctoral dissertation by Martin (1974) on attempted suicides. In addition, in our knowledge, Martin's signs are never mentioned elsewhere in the Rorschach literature and are surely superseded by more modern, reliable and valid Rorschach indexes of suicidality.

Comparison between murderers and normal controls (N = 8)

The first three studies (Bukowski & Gehrke, 1979; Endara, 1960; Tsuboi & Takemura, 1960), suffer from important methodological limitations, as they didn't specify Rorschach method and statistical procedures. Consequently, their results should rather be regarded as working hypotheses requiring confirmation in much larger samples, according to flawless design, aiming to verify if murderers' Rorschach, when compared with those of normal controls, effectively show:

- a lower % frequency of human responses and a higher % frequency of devitalized and degraded human responses, in table I and VII, as evidenced by Endara (1960);
- lower mean values as regard R, M, FC and A%, and higher mean values for Rejection, F%, C, and Ad%, as found by Tsuboi & Takemura (1960);
- higher F%, lower determinants FK+M+FC+FC', and a higher frequency of sadistic contents (such as organ mutilations and parts), as suggested by Bukowski & Gehrke (1979).

On the contrary, five most recent studies by three different and independent Italian research teams, respectively by two groups both from University of Bologna, i.e. that of prof. Roberta Bisi (Gambineri, 2004b) and that of prof. Luca Cimino (Cimino, 2018b, 2018c; Cimino, Atti & De Ronchi, 2013; Cimino, De Ronchi & Atti, 2012), and that by the IRF Istituto Rorschach Forense in Rome (Cicioni, Caravelli, D'Agata, & Della Vecchia, in press), used the same Rorschach method (SRR, Scuola Romana Rorschach) (Cicioni, 2016, 2020; Rizzo, Parisi, & Pes, 1980; Parisi, & Pes, 1990a, 1990b, 2003, 2010), according to a well-designed and very similar methodological approach, and finally obtained, for the first time, largely convergent and concordant results.

Since methodology is quite similar, it is possible to pool data from these five studies.

A total of 155 Rorschach test from male murderers tested for forensic purposes, during pre-trial examination in prison, all legally sane, with no history of psychiatric symptoms or diagnosis, alcohol or drug abuse, psychotherapeutic treatment or use of psychotropic drugs, all administered the test for the first time, according SRR (Scuola Romana Rorschach) (Cicioni, 2016, 2020; Rizzo, Parisi, & Pes, 1980; Parisi, & Pes, 1990a, 1990b, 2003, 2010), were retrospectively examined: 20 by Gambineri (2004b; mean age: 29 years), 20 by Cimino, De Ronchi & Atti (2012), 15 by Cimino, De Atti & De Ronchi (2013; mean age: 43.2; all 'crime of impetus'), 15 by Cimino (2018a; 13 males, 2 females; mean age: 41.4; all 'crime of impetus'), 85 by Cicioni, Caravelli, D'Agata, & Della Vecchia (in press; mean age: 37 years). 155 normal controls, matched for sex and age, without any history of crimes, served as comparison; results in murderers' group were also compared with SRR normative data for normal population (Cicioni, 2016, 2020; Giambelluca, Parisi & Pes, 1995; Parisi & Pes, 1990a). All principal indexes and variables of SRR were considered; the data were statistically analyzed by means of Mann-Whitney U test (Gambineri, 2004b), Student two tailed t test (Cimino, De Atti & De Ronchi, 2013), Student two-tailed t test, chi square test and multivariate logistic regression analysis (Cimino, 2018a), chi-square and Mann-Whitney U test (Cicioni, Caravelli, D'Agata, & Della Vecchia, in press).

According to Gambineri (2004b), murderers sample evidenced:

- lower A+Ad (7 vs 11; $p < 0.05$);
- higher O% (23.7 vs 13.0; $p < 0.05$).

According to Cimino, Atti & De Ronchi (2013), murderers sample showed:

- lower R (16.67 vs 25.27, $p < 0.0001$);
- lower G (7.73 vs 9.35, $p < 0.005$);
- higher M (2.37 vs 1.00, $p < 0.0001$);
- higher Impulsivity Index (0.96 vs 0.33, $p < 0.0005$).

According to Cimino (2018a), murderers sample reported:

- lower R (range: 11-24 vs 19-33; mean: 16.67 vs 25.27; SD: 3.74 vs 4.13; $p < 0.0001$);
- higher V% (range: 17-65 vs 17-26; mean: 33.53 vs 22.27; SD: 13.69 vs 2.09; $p < 0.005$);
- higher O% (range: 5-78 vs 5-20; mean: 28.13 vs 11.20; SD: 17.72 vs 3.69; $p < 0.001$);
- lower O+% (range: 14-70 vs 67-78; mean: 43.20 vs 72.60; SD: 17.59 vs 3.33; $p < 0.0001$);
- higher G (mean: 9.35 vs 7.37; $p < 0.005$);
- lower M (mean: 1.00 vs 2.87; $p < 0.0001$);
- higher Impulsivity Index (mean: 0.96 vs 0.33, $p < 0.001$);
- lower Affectivity Index 2 (mean: 25.40 vs 42.00, $p < 0.0001$).

Finally, according to Cicioni, Caravelli, D'Agata, & Della Vecchia (in press), murderer sample obtained:

- lower R (mean: 17.3 vs 22.8; SD: 7.4 vs 13.2; $p < 0.02$);
- lower R+% (mean: 76.7 vs 81.6; SD: 12.8 vs 10.3; $p < 0.02$);
- lower M (mean: 1.4 vs 2.2; SD: 1.7 vs 2.1; $p < 0.006$);
- lower m (mean: 2.0 vs 3.3; SD: 2.1 vs 2.9; $p < 0.002$);
- lower H (mean: 2.2 vs 5.3; SD: 2.1 vs 4.1; $p < 0.001$);
- lower V (mean: 5.2 vs 5.9; SD: 1.9 vs 2.1; $p < 0.02$).

If we consider the whole group of 155 murderers, taking into consideration the trends and not only the statistically significant differences, we obtain an almost uniform picture.

Murderers Rorschach, when compared to normal controls, show: lower R, lower R+%, lower M, lower H, lower A+Ad, lower V, higher O%, lower O+%, higher Impulsivity Index and lower Affectivity Index.

Moreover, the results of these studies not only confirm each other, but also confirm many evidences obtained through descriptive studies without a control group (Zizolfi, et al., 2023b):

- low R (Anastasiadis, 1965; Durand de Bousingen, 1971; Karsvnie, Lazcano De Anta, Rigazzio & Saade De Alonso, 2000; Kaser-Boyd, 1993; Satten, Menninger, Rosen & Mayman, 1960, Schachter & Cotte, 1972);

- low M (Durand de Bousingen, 1971; Karsvnie, Lazcano De Anta, Rigazzio & Saade De Alonso, 2000; Perdue, 1961, 1964);
- low H (Durand de Bousingen, 1971; Perdue, 1961, 1964; Sethi, Gupta & Nathawat, 1971; Zizolfi, Catanesi, Grattagliano, & Zizolfi, 2017);
- low V (Sethi, Gupta & Nathawat, 1971);
- high Impulsivity Index (Zizolfi, Catanesi, Grattagliano, & Zizolfi, 2017);
- low Affectivity Index (Kaser-Boyd, 1993).

However, one must take into account that all these differences are not specific and mostly small or very small, although statistically significant (with the only exceptions of lower R, lower H and higher impulsivity Index).

Finally, the high inter-individual variability should be underlined, with SD values often higher than those of the means.

Conclusions

Comparison studies between murderers and suicides and attempted suicides (Lester & Perdue, 1972; Lester & Perdue, 1974a; Lester & Perdue, 1974b) have been mentioned for the purpose of completeness of the present review, but they are mainly of historical interest, because of their great methodological limitations and the lack of confirmatory research.

Also the first three studies, comparing murderers and normal controls (Bukowski & Gehrke, 1979; Endara, 1960; Tsuboi & Takemura, 1960), suffer from important methodological limitations, as they didn't specify Rorschach method and statistical procedures, and lack of confirmatory research.

Otherwise, more recent contributions by three different and independent Italian research teams (Cicioni, Caravelli, D'Agata, & Della Vecchia, in press; Cimino, 2018b, 2018c; Cimino, Atti & De Ronchi, 2013; Cimino, De Ronchi & Atti, 2012; Gambineri, 2004b), all using the SRR method (Scuola Romana Rorschach) (Cicioni, 2016, 2020; Rizzo, Parisi, & Pes, 1980; Parisi, & Pes, 1990a, 1990b, 2003, 2010), have obtained more consistent and interesting results, according to a flawless retrospective design. Since methodology is quite similar, it is possible to pool data from all these studies. A total of 155 male murderers tested for forensic purposes, during pre-trial examination in prison, all legally sane, were compared with 155 male normal controls, matched for sex and age, without any history of crimes; all the subjects were administered the Rorschach the first time; all the subjects have no history of psychiatric symptoms or diagnosis, alcohol or drug abuse, psychotherapeutic treatment or use of psychotropic drugs. All the principal indexes and variables of SRR were considered; the data were statistically analyzed by means of Mann-Whitney U test (Gambineri, 2004b), Student two tailed t test (Cimino, De Atti & De Ronchi, 2013), Student two-tailed t test, chi square

test and multivariate logistic regression analysis (Cimino, 2018a), chi-square and Mann-Whitney U test (Cicioni, Caravelli, D'Agata, & Della Vecchia, in press). The whole group of 155 murderers, if we take into consideration the trends and not only the statistically significant differences, show an almost uniform psychodiagnostic picture, with lower R, lower R+%, lower M, lower H, lower A+Ad, lower V, higher O%, lower O+%, higher Impulsivity Index and lower Affectivity Index. Moreover, the results of these studies not only confirm each other, but also confirm many evidences obtained through descriptive studies without a control group (Zizolfi, et al., 2023b).

According to these results, murderers' Rorschach highlight a global inhibition of personality (low R, low M), a nuanced reduction in the precision of thought (low R+%), an impairment of interpersonal relationships, both formal (low H) and emotionally invested (Affectivity Index), a reduced participation in the most common interests (low A+Ad) and in common sense (low V), some notes of original thinking (high O%), that are not always adherent to reality (low O+%).

However, one must take into account that all these differences are not specific and mostly small or very small, although statistically significant (with the only exceptions of more relevant differences, as lower R, lower H and higher impulsivity Index). Finally, the high inter-individual variability should be underlined, with SD values often higher than those of the means.

All the studies considered concern Rorschach data collected after the murder, in a jail context, for forensic or research purposes, after a variable time from the murder. As a consequence, the results are not generalizable, except to populations of a similar type, taking into consideration and possibly controlling all the variables involved.

In no case, a retrospective design of this type could generate data that may be considered 'predictive' of homicidal behavior: studies and data of this type can only be useful as terms of comparison and guide for the interpretation of Rorschach tests collected in the forensic field.

In conclusion, it must be taken into account that homicide is a rare, low-base-rate phenomenon, and a highly variable behavior, different from case to case. The small although statistically significant differences between murderers' and normal controls Rorschach, and the high inter-individual variability of murderers' Rorschach records question the very existence of a 'murderous mind', or of a 'murderous personality', i.e. common to all or some murderers: merely, a working hypothesis of dubious and questionable validity.

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