Rorschach Indices of Personality in Aircrew Referred for Psychological Evaluation

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ABSTRACT

Rorschach Inkblot Test, a projective technique of personality measurement has been used at IAM as a part of routine psychological evaluation for aircrew. This test supplements information gained from objective questionnaires. Previous studies in other countries, have shown that subgroups of aircrew can be differentiated on the basis of Rorschach indices. The reference standards for comparison of Rorschach indices in Indian aircrew are presently unavailable. Therefore, the aim of this study was to derive Rorschach reference scores for comparison of aircrew referred for psychological evaluation.

Sixty one aircrew were studied in three groups; non clinical, medical and psychiatry. All underwent a clinical interview and were administered the Rorschach test individually with no testing of limits by one of two trained psychologists. Responses were scored following Rapaport's (1970) method in terms of location, determinants and content, and results tabulated. Descriptive statistics were compiled for sub categories of aircrew. Differences between groups were statistically analyzed using 't' test.

Results indicated significant differences between the groups in content responses and non significant differences in location and determinant indices. Some trends in the whole group of aircrew and differences between groups were observed. These findings and their implications are discussed, with respect to the utility of Rorschach for differentiating subgroups of aircrew, during medical evaluation.

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Mental and psychological functions like personality, intellectual and memory functions are measured with the help of a variety of psychological tests. Personality refers to the distinctive and enduring patterns of behaviour (including thoughts and emotions) that characterize each individual's adaptation to the situations in his/her life. Personality measurement has been one of the major achievements in the field of psychological evaluation. Differences in personality are likely to be influenced by occupational role and the requirements for the individual's efficient functioning. Apart from this certain medical and psychiatric conditions may result in differences in personality, due to the illness per se.

Three types of tests are basically used in personality assessment; structured or objective tests, semi structured and unstructured tests or projective tests.

The structured tests like questionnaires are direct, transparent, meaningful and predictable. The semi structured tests like Thematic Apperception Test convey different meanings to different people at different times. In unstructured tests like the Rorschach test, the stimuli are purely ambiguous and vague and elicit variety of responses from different people.

The Rorschach test is one of the most extensively used tests in clinical evaluation both for assessing personality as a whole and especially in India also as a psychodiagnostic tool (1). Psychological evaluation of the aircrew referred for psychiatric disabilities,

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psychological factors influencing medical illness eg. low backache, and such conditions as lack of motivation and loss of confidence for flying, is a part of their medical evaluation. Since the medical category given during their medical evaluation affects the occupational role status, aircrew often tend to be cautious when answering self report/objective questionnaires and have a tendency not to reveal their true selves.

The Rorschach test has proved to be more useful in such situations. Here the individual is likely to project his own conflicts, motives, feelings, needs, aspirations, coping strategies, complexes through the ambiguous stimuli without being really conscious about his responses, inadvertently, involuntarily revealing his own actual personality characteristics. Even though the test is subjective and expertise is essential for interpretation, since the individual does not have ideas as to what aspect of his behaviour is being measured (1) the test has been found to be a good psycho diagnostic tool (1,2). The test acts as a supplement to the objective tests like self report questionnaires to arrive at more reliable information. Rorschach ink blot test was devised by a Swiss, Hermann Rorschach as early as 1921(3). This test consists of 10 bisymmetrical ink blots where in 5 cards are in black and white in different shades (achromatic), two in black and white with shades of red and three more which are exclusively colored (chromatic).

Although there are innumerable studies including Indian ones on the civil population, research on military population using Rorschach are few. There are three Indian studies on army personnel two on normal and one on clinical population (4, 5, 6). The former study (4) revealed low productivity (R), high unsatisfied instinctual need (FM) and an overall constriction among normal army personnel as compared to civilian population. The third study (6) found that the psychiatry group studied showed lesser M and FM, higher pure C responses and also content-wise more of anatomical, sex, cloud and blood responses as compared to the civilian population. Another study (7) conducted at IAM on the personality characteristics of referred and non-referred airman trainees found the referred group to have significantly lower FC and Fc, trend of lower M, increased F, slower reaction time, and also higher Geol and Cloth responses.

Rorschach studies on aviators are few and no studies on Indian aircrew have been reported. A study on US naval medicos (8) has found susceptibility for motion sickness highly correlated with rigidity, and emotional lability.

In another study on aviator's psychiatric strengths and weaknesses (9), researchers found no significant psychopathology. The pilots were found to be productive, R being within normal range. W percentage exceeded the normal range suggesting adequate ability to organize and integrate. D percentage was within normal range indicating practicality. M though less than desired, suggested good restraint in interpersonal relationships. The FM was slightly more than M which indicated mild emphasis on immediate need gratification. F percent was within the normal range indicating the ability to be impersonal. FC was within acceptable limits, an indication of good emotional adjustment. CF was mildly elevated showing spontaneous and genuine responsiveness to emotional stimuli and good potential to act out. R percent was within normal limits indicating normal responsiveness to external stimulation. The ratios indicated high level of aspiration, and underdeveloped affectional need.

A recent study on aircrew (10) has shown that aircrew can be differentiated based on Rorschach indices. A group with good flying skills showed more K,FC, better form level, and less CF whereas the group with not so good flying skills were nervous and anxious, more dependent and had few effective and objective coping strategies.

So far no Indian studies are available on the personality indices of IAF aircrew using Rorschach and therefore the reference standards for comparison of aircrew are presently unavailable.

Aim

To derive reference scores for comparison of personality in three different groups of aircrew i.e. non-clinical, medical and psychiatry groups using Rorschach indices.

TABLE I
DIAGNOSTIC CATEGORIES OF THE AIR CREW SAMPLE

NON CLINICAL		MEDICAL		PSYCHIATRY	
Diagnosis	No of cases	Diagnosis	No. of cases	Diagnosis	No. of cases
Low motivation for flying	05	Fear of flying	05	Anxiety	02
Loss of confidence for flying	03	Hypertension	02	Neurotic depression	04
Low G tolerance	01	Low backache	13	Alcoholic dependency syndrome	03
Poor scholastic performance	01	Post spinal injury	04	Adjustment disorder	01
		Head ache	05	Para suicide	01
		Stammering	03	Neurosis	01
		Air sickness	03		
		Below knee amputation	01		
		Post head injury	01		
		Dizziness	02		
Total	10		39		12

TABLE II A
DEMOGRAPHIC SAMPLE CHARACTERISTICS
OF PERCENTAGE OF AIRCEW POPULATION

Sex	Male	98
	Female	02
Marital Status	Married	48
	Single	51
	Divorcee	01
Present flying stream	Fighter	59
	Transport	21
	Helicopter	10
	Navigator	03

The subjects were studied under three groups; non-clinical, medical and psychiatry, and demographic characteristics of the three samples are shown in Tables IIA and IIB.

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TABLE II B
DEMOGRAPHIC CHARACTERISTICS OF THE AIRCREW POPULATION

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CHARACTE-RISTICS	NON CLINICAL MEAN (SD)	N	MEDICAL MEAN (SD)	N	PSYCHIATRY MEAN (SD)	N
Age	26.33 (4.24)	9	27.75 (3.89)	40	30.83 (9.50)***	12
Education	15 (0)	9	15 (0)	40	14.75 (1.22)***	12
Service (yrs)	5 (4.33)	9	23.83 (110.54)	40	7.41 (6.80)	11
Flying Hrs	738.29 (770.64)	7	941.52 (1315.70)	38	2510.50 2851.59)*	10

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*** p< 0.0001, *p<0.03

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Method

Subjects

Aircrew predominantly from Air Force (pilot officer to Sqn Ldr) and some from Navy (Lt Cdr & Cdr) and civil aviation, were referred for psychological evaluation, to the Dept of Psychology from Medical Evaluation Center, as a part of medical evaluation. During the course of seven years from 1996 to 2003, 61 aircrew under different diagnostic categories, constituted the sample for the study (Table I)

On the demographic characteristics, the psychiatry group was significantly different compared to the other two groups. They were older, less educated and had a higher number of flying hours.

Procedure

Subjects underwent detailed clinical interviews and there after were individually administered the Rorschach inkblot test using a standard method (11) after other objective tests were administered. The subjects were asked to say what the pictures looked like. The responses for all the cards were elicited verbatim in succession, after which the inquiry was conducted; direct questioning for accurate coding of certain responses was done. No testing of limits was utilized. Two trained psychologists administered the tests to the majority of aircrew in English, and to a very few in Hindi.

Scoring and Statistical Analysis

Several scoring procedures are available which often overlap. Responses were scored under several categories using Rapaport's method of scoring (11). Responses were scored based on location, determinants and content. Variables under location were percentage W (whole) D (large detail), Dd (unusual detail) and S (space response). Determinants were M (human movement) FM (animal movement) and m (inanimate movement) Fc (texture) FC' (achromatic color) Fk (depth) F (form) and color responses such a FC (form predominant color), CF (colour predominant form) and C (pure colour). Apart from these, content responses like H (human), Hd (human detail), A (animal), Ad (animal detail), Pl (plant), Geol (geology), Geo (geography), Sex, etc were also scored resulting in 45 Rorschach variables. Certain mean ratios of different variables were also calculated. Results were tabulated and the means and SDs of the three groups were compared statistically on the different variables using the Student's 't' test. The three groups of Non Clinical, Medical and Psychiatry groups were compared in three comparisons. The non-clinical group was compared with the medical group and psychiatry group respectively and the medical group was compared with the psychiatry group.

Results

Table III shows the normative data of location and determinant variables of the three groups. On productivity (R), medical group was the least productive.

TABLE III
NORMATIVE DATA OF LOCATION AND DETERMINANT
VARIABLES IN THE THREE GROUPS

Rorschach Variable	Non Clinical Group			Medical Group			Psychiatry Group		
	Mean	(SD)	N	Mean	(SD)	N	Mean	(SD)	N
R	30.20	(6.43)	10	26.18	(7.58)	39	30.83	(6.48)	12
P	5.50	(1.43)	10	5.72	(1.38)	39	5.58	(1.44)	12
%W	45.20	(12.87)	10	47.18	(17.37	39	37.83	(14.09)	12
%D	51.90	(13.23)	10	49.82	(15.99)	39	56.33	(11.65)	12
%Dd + S	18.00	(10.24)	10	15.82	(12.60)	39	11.50	(7.31)	12
M	3.60	(2.27)	10	3.92	(2.13)	39	4.25	(3.25)	12
FM	6.60	(3.66)	10	6.25	(2.69)	39	7.08	(4.40)	12
m	2.50	(2.01)	10	2.04	(2.18)	39	2.50	(2.75)	12
Fc	4.20	(1.99)	10	4.12	(2.07)	39	4.00	(2.56)	12
FC'	1.30	(1.34)	10	2.03	(1.68)	39	1.83	(1.70)	12
Fk	2.50	(0.97)	10	1.92	(1.38)	39	1.33	(1.44)	12
%F	27.20	(10.74)	10	23.54	(11.80)	39	28.25	(12.21)	12
FC	3.70	(1.83)	10	3.82	(2.26)	39	3.42	(1.44)	12
CF	1.80	(1.03)	10	1.82	(1.25)	39	2.75	(1.29)	12
C	0.00	0.00	10	0.00	0.00	39	0.08	(0.29)	12
F(C)	0.30	(0.68)	10	0.23	(0.63)	39	0.33	(0.65)	12
%CR	40	(6.57)	10	40.03	7.97	39	39.16	7.16	12
Sum C	3.60	(1.73)	10	3.69	(1.73)	39	4.54	(1.21)	12
L Ach Time	43.10	(36.24)	10	43.64	(34.31)	39	41.55	(14.67)	12
S Ach Time	6.50	(5.36)	10	7.80	(5.35)	39	6.45	(4.95)	12
L Ch Time	42.00	(26.13)	10	57.61	(61.54)	39	48.09	(17.59)	12
S Ch Time	14.90	(16.58)	10	11.08	(7.35)	39	11.91	(6.41)	12

The number of popular responses (P) showed small differences. The mean reaction times such as longest chromatic (LCH), longest achromatic (LACH), shortest achromatic (SACH) to cards were highest in medical group. The mean reaction time to shortest chromatic (SCH) card was longest in the non-clinical group.

In location category, the medical group showed higher W% and reduced D% and the psychiatry group was low on W%, high on both D% and Dd and S%. The non-clinical group showed relatively higher Dd and S%. In the determinant category, non-clinical group showed the least M, FC', CF, Sum C, and were highest on Fc and Fk responses. The medical group was lowest on FM, m, F%, F (C) and highest on FC', FC and CR%.

The psychiatry group was lowest on CR%, Fc, FC, Fk and highest on M, FM, F%, CF, F(C) and Sum C.

TABLE IV
NORMATIVE DATA OF CONTENT VARIABLES IN THE THREE GROUPS

Content	Non Clinical			Medical Group			Psychiatry Group		
	Mean	(SD)	N	Mean	(SD)	N	Mean	(SD)	N
A%	37.70	(16.41)	10	34.28	(11.76)	39	41.50	(18.87)	12
Ad	2.20	(2.15)	10	2.10	(1.80)	39	2.17	(1.11)	12
Anal	10	(.32)	10	00	()00	37	00	(00)	11
Arch	30	(.68)	10	.29	(.85)	37	.27	(.65)	11
At	.90	(1.52)	10	.41	(.59)	39	67	(1.15)	12
Ats	.90	(1.66)	10	.45	(.69)	38	.09	(.30)	11
Bl	.10	(.32)	10	.08	(.36)	37	45	(.93)	11
Cl	.20	(.63)	10	.66	(.94)	38	.64	(1.21)	11
Cloth	.70	(.82)	10	1.21	(1.85)	38	.45	(.82)	11
Fire	.60	(1.08)	10	.58	(1.11)	38	.42	(.67)	12
Geo	.50	(.85)	10	.63	(.82)	38	.45	(.82)	11
Geol	.20	(.42)	10	.38	(.83)	38	.73	(.90)	11
H	3.40	(2.76)	10	3.79	(2.16)	39	3.25	(1.91)	12
Hd	2.10	(1.73)	10	2.77	(8.39)	39	1.42	(1.51)	12
Ldsc	.20	(.42)	10	.29	(.57)	38	.09	(.30)	11
Misc	4.00	(2.67)	10	3.44	(2.57)	39	3.08	(2.64)	12
N	.30	(.68)	10	.23	(.49)	39	50	(.85)	10
Obj	3.5	(2.95)	10	3.08	(2.13)	39	3.73	(2.87)	11
Pl	2.7	(1.57)	10	2.42	(2.05)	38	2.33	(2.02)	12
Sex	.20	(.63)	10	.05	(.23)	37	.27	(.90)	11
Sm	.10	(.32)	10	.41	(.83)	37	.18	(.40)	11
Xray	.10	(.32)	10	.08	(.36)	37	.09	(.30)	11

Table IV shows the normative data of content variables. Comparisons of mean values indicate that the non clinical group showed lowest Geol, Sm, Cl, responses and were highest on Ad, At, Ats, Pl, Anal, Arch, X-ray, Fire and Misc responses. The medical group showed least A%, Ad, At, N, Obj, Bl, Sex, X-ray and were highest on H, Hd, Geo, Sm, Cl, Ldsc and Cloth responses. Psychiatry group showed least Arch, Ats, H, Hd, Pl, Geo, Cloth, Ldsc, Misc, and Fire and were highest on A%, Obj, Geol, Bl, Sex, and N.

Ratios in all three groups are shown in Table V. In FM: M ratio FM was more than M in all the three groups,

the highest being in the psychiatry group and the least in the medical group. For M: FM + m ratio, the latter value was always more than one and half times, with the psychiatry group being the highest and the medical group being the lowest. All the groups were adequate in the colour balance. The movement to colour ratio was double in all groups, being highest in psychiatry group. In the Fk+Fc: F ratio, the non-clinical and psychiatry group were less than one fourth and the medical group was within average limits. The chromatic/achromatic ratio was balanced in all the groups. In the W:M ratio the medical group was in the normal range, whereas in the other two groups the ratio was higher.

In the statistical comparisons for significant differences on Rorschach indices between non clinical and the medical groups, no significant differences on location and determinants were found. In the content category, Anal (19.93, p<0.0001), At (26.27, p<0.0001), Ats (12.31,

TABLE V
MEAN RATIOS OF DIFFERENT VARIABLES IN THREE GROUPS

Ratios	Non Clinical	Medical	Psychiatry
M : FM	3.60 : 6.60 (0.5)	3.92 : 6.25 (0.6)	4.25 : 7.08 (0.6)
M : FM + m	3.60 : 9.10 (0.4)	3.92 : 8.29 (0.5)	4.25 : 9.58 (0.4)
FC : CF + C	3.70 : 1.80 (2.1)	3.82 : 1.82 (2.1)	3.42 : 2.83 (1.2)
M + sum C	7.20	7.61	8.79
FM + M : FC + C +FC'	10.20 : 5 (2.04)	10.17 : 5.85 (1.7)	11.33 : 5.33 (2.1)
Fk + Fc : F	6.70 : 27.20 (0.2)	6.04 : 23.54 (0.3)	5.33 : 28.25 (0.2)
Fc + FC' : FC + CF + C	5.50 : 5.50 (1.0)	6.15 : 5.64 (1.1)	5.83 : 6.25 (0.9)
W:M	13 : 3.60 (3.6)	7 : 3.92 (1.8)	12:4.25 (3.0)

p<0.001), and Sex (6.18, p<0.01), responses were significantly higher in non clinical group. The medical group was significantly higher on sm (5.76, p<0.02), and cl (6.45, p<0.01), responses.

In the statistical comparison between the medical and the psychiatry groups on the location variables, the medical group showed higher trend in Dd and S% responses than the psychiatry group (3.50, p<0.07). On determinants, the medical group showed a trend of increased FC responses (2.76, p<0.10), where as the psychiatry group was significantly higher in the pure C responses (16.49, p<0.0001). In the content category, the medical group was significantly higher in Ats (10.92, p<0.002), Ldsc (6.13, p<0.01), Clothing (4.16, p<0.05), sm responses (3.34, p<0.07), whereas the psychiatry group was significantly higher in Bl (12.88, p<0.001), N (7.87, p<0.007), Sex (8.66, p<0.005), and A% (3.39, p<0.07) responses. A trend of longer time taken for achromatic cards was observed in medical group as compared to psychiatry group (3.23, p<0.08).

When non clinical group was compared with the psychiatry group no significant differences were found in the location category. In the

determinants, the psychiatry group had trend of higher pure C responses compared to non clinical (3.58, p<0.07). In content, significant differences were found in the non clinical group who were higher on Ad (5.07, p<0.04), Anal (6.47, p<0.02), Ats (14.12, p<0.001), responses, where as, psychiatry group showed significantly higher differences in Bl (4.30, p<0.05), Geol (10.27, p<0.005), Sm (11.90, p<0.003), and X-ray (4.00, p<0.06), responses. A trend of longer time taken for shortest response time to achromatic cards was observed in psychiatry group as compared to non clinical group (4.1, p<0.06).

Discussion

There were no significant differences in the total number of responses in the three groups, all groups were within normal range. When compared with a previous study on aircrew (9) these values are lower. This could be because the aircrew sample of the previous study was selected randomly from a larger group. In our study the sample consisted of only aircrew referred for medical evaluation. The medical group showed relatively lower number of responses (R), indicating the richness of productivity in terms of quantity which basically depends on the wealth of perceptual and associative processes. Inhibition and cautiousness are known to result in lower R (11). Referral for psychological evaluation in all three groups may have resulted in restrained productivity, which was especially so in the medical group who may have perceived it as an unexpected non-routine referral.

The number of popular responses also did not show any significant

differences among the three groups. Location variables showed no gross differences among the three groups although aircrew as a whole, showed a tendency towards perceptual over generalization in their associative processes. This finding is in line with a previous study (9), although the values of the non-clinical and medical groups here are higher. This could be due to perceived stress of the psychological evaluation, which was not present in the psychiatry group, who tend to expect a referral for psychological testing. Medical group also showed a trend of being more intellectually oppositional than the psychiatry group.

In the determinant category the three groups did not show any significant differences except in FC and C. FC values were higher in this study as compared to a previous study (9). The FC difference though not significant, indicated a trend suggesting that the medical group had better affective control and emotional balance than the psychiatry group. Colour indices differentiate groups of pilots in clinical evaluation as is found in the general population (11). Psychiatry subjects are more likely to be prone to emotional imbalance. The psychiatry group also had significantly higher C than both other groups indicating lack of impulse control (11).

In one of the Japanese studies on aircrew (10) it was found that the FC and CF indices could differentiate two groups of pilots on the basis of flying performance. It is known that emotional factors influence flying performance. In one study (12) conducted in which specific attitudes and thought patterns that might serve as precursors to faulty pilot judgment were isolated, impulsivity was found to be one thought pattern identified as hazardous in the aviation context.

Content suggests wealth of productivity in terms of quality. This category showed the maximum significant differences. The normal group showed higher Anal, At, Ats and also Sex responses than the non clinical group. This group appears to be more preoccupied with bodily, anal and sexual matters as compared to both medical and psychiatry groups of aircrew. The medical group was higher on sm and cl responses, indicating anxiety,

regarding medical evaluation which could have repercussions on their flying category, unlike the other groups who as a result of their conditions do not expect to go back to flying and hence medical evaluation is not perceived as being important. A previous questionnaire study found successful pilots to be relatively low on anxiety (13).

The medical group was significantly higher in Ats and Cloth. The psychiatry group was significantly higher in Bl responses indicating aggression and also A% and sex responses, suggesting difficulty in social adjustment and sexual pre occupation; possibly due to underlying psycho pathology. Psychiatry group was also significantly higher in Bl, Geol, smoke and X-ray as compared to the normal group suggesting features of illness such as anxiety and aggression. A similar study comparing normal and clinical groups in military population on Rorschach Indices also found higher anatomical, sex, cloud and blood responses among the clinical group (5).

Longest time taken on achromatic cards was more in medical group than the psychiatry group indicating inhibition, which could be, possibly due to cautiousness in their responses, which may affect their career. Shortest time taken on achromatic cards was more in psychiatry group than the normal group indicating lack of emotional inhibition.

The ratios indicated that all groups had more of instinctual gratification (possibly due to inner tensions) than long term value orientation. Level of aspiration exceeds the intellectual potential in the non-clinical and psychiatry groups and was within normal limits in the medical group. All groups showed balanced sensitivity to both self and others, with good interpersonal functioning. Affectional need is adequate in the medical group and underdeveloped in the other groups. Groups indicated dilation. Non clinical and medical groups showed good emotional balance. Excepting the color ratios, many of these findings supported the previous study on aircrew (9).

Conclusion

In conclusion, there were a number of common features of the aircrew group and also some features differentiated the three groups. Aircrew as a group were high on W%, Dd and S%, M, FM. m, Fc, Fk and FC. This indicates high perceptual organizational ability and abstract functioning, with a tendency for intellectual opposition. They had high emotional control, adequate imagination, empathy, ego strength, high awareness and acceptance of affectional needs in self and others. They had relatively more emphasis on immediate gratification of impulses and had an underlying tension and conflict awareness, which was under control.

The three groups could also be differentiated mainly by content responses. The non-clinical group were high on anatomical responses indicating bodily preoccupation. The medical group had low productivity, possibly due to unexpected referral for psychological evaluation leading to inhibition. They were high on S%, indicating intellectual opposition. FC was relatively higher in this group indicating good affective control and balance. High cl and sm content indicated anxiety regarding medical evaluation/illness. The psychiatry group were high on C, A%, sex and Bl responses indicating lack of emotional balance and impulse control, difficulty in social adjustment, sexual preoccupation and aggression. These features were possibly due to the underlying psychopathology. It is concluded that use of Rorschach for differentiating subgroups of aircrew, during medical evaluation can enhance the utility of psychological assessment.

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