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Intelligence and nonintelligence factors contributing to scores on the Rorschach prognostic rating scale

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AN ABSTRACT OF THE THESIS OF Anneke P. Hathaway for the Master of

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Title: Intelligence and Nonintelligence Factors Contributing to

Scores on the Rorschach Prognostic Rating Scale.

APPROVED BY MEMBERS OF THE THESIS COMMITTEE:

Walter G. Klopfer, Chair

Ronald E. Smith

Barbara Stewart

David H. Martinez

Correlation between the RPRS total and WAIS FSIQ showed that
approximately 43% of the variance in the RPRS total can be accounted
for by the variance in the FSIQ. Verbal IQ is not significantly high-
er correlated with the RPRS total than the Performance IQ ($p < .10$).
Factor analysis of the 6 RPRS subscores resulted in 2 factors. Sub-
sequent factor analysis of the 6 RPRS subscores plus FSIQ and the factor

analysis of the 6 RPRS subscores plus PIQ and VIQ showed the first factor to be an intelligence factor accounting for 85% of the common variance. The RPRS variables FL, FM, M and Sh loaded on this factor. The second factor was a nonintelligence factor accounting for 15% of the common variance. Small m is clearly the main determinant of this factor followed by Sh. In addition, the results of 2 exploratory factor analyses are discussed. The first exploratory factor analysis involved 23 variables, namely the 6 RPRS subscores, RPRS total, the 11 WAIS subscales, FSIQ, VIQ, PIQ, VIS and OABD. The second exploratory analysis involved 17 variables, namely the 6 RPRS subscores and the 11 WAIS subscales.

INTELLIGENCE AND NONINTELLIGENCE FACTORS

CONTRIBUTING TO SCORES

ON THE RORSCHACH PROGNOSTIC RATING SCALE

by

ANNEKE P. HATHAWAY

A thesis submitted in partial fulfillment
of the requirements for the degree of
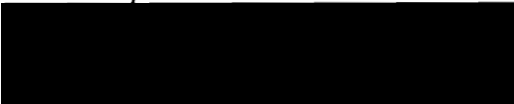
MASTER OF ARTS

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TO THE OFFICE OF GRADUATE STUDIES AND RESEARCH:

The members of the Committee approve the thesis of

Anneke P. Hathaway presented December 12, 1978.

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INTRODUCTION

As the demand for psychological services grows psychologists
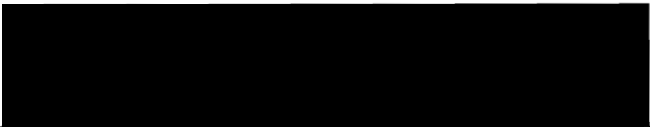are increasingly required to screen and select candidates for psy-
chotherapy. One major criterion applied in making such difficult
decisions is the projection of a successful outcome from the proposed
therapy. As Garfield and Affleck (1961) have indicated, this prog-
nosis is often based on intuitive and subjective criteria. They found
that therapists' rating of prognosis is highly correlated with the
personal feelings of the raters towards the patients ($r = .66$; $p < .05$).
Ratings of "interest in taking patient into treatment" were also highly
correlated with both rating of therapeutic prognosis ($r = .65$; $p < .05$)
and the personal feelings of the raters towards the patient ($r = .63$;
$p < .05$). They conclude that "the average therapist prefers a patient
who is intelligent, well motivated for therapy, young and with some in-
sight into his difficulties." This description bears close resemblance
to the type of preferred patient mentioned in the research by Hollings-
head and Redlich (1958). It is highly likely that a patient with such
attributes will benefit from psychotherapy, but what about the person
who does not quite fit this description of "ideal client"? A more ob-
jective and scientific approach to identification and use of the factors
which contribute to a favorable prognosis seems to be desirable.

This study will attempt to help identify these factors, by means of a factor-analytic study of the Rorschach Prognostic Rating Scale (RPRS) and of the Wechsler Adult Intelligence Scale (WAIS).

CHAPTER II

THE RORSCHACH PROGNOSTIC
RATING SCALE

History

The RPRS was developed by Bruno Klopfer and published in 1954
(Klopfer et al 1954). It was designed to use the Rorschach to pre-
dict a patient's response to psychotherapy and to establish treatment
goals and treatment potential. The rating scale was conceived as a
measure of the total ego-strength potential. It measures available
ego-strength and the unused portion of adjustment potential which
might be mobilized through psychotherapy. Both the used and unused
portions of the ego-strength are measured together. The RPRS is
especially useful for patients who are placed in a diagnostic cate-
gory generally assumed to have unfavorable prognosis for therapy.
The RPRS is able to distinguish those patients who have sufficient
ego-strength to benefit from psychotherapy despite their diagnostic
"label". In these cases there will be a discrepancy between clinical
picture and ego-strength. This discrepancy will be diminished by suc-
cessful therapy (Klopfer et al 1954).

Calculating the RPRS

The RPRS, as described by Bruno Klopfer consists of six categor-
ies:

1) Human movement (M) relates to the ability to deal with real human relations in an emphatic way.

2) Animal movement (FM) is an index of the handling of stress tolerance and the degree of comfort or lack of comfort a person feels with regard to his drive impulses.

3) Inanimate movement (m) indicates subjective discomfort.

4) Shading responses (Sh) show how affectionate needs are organized and expressed. These organized patterns range from insensitivity, evasion and denial of affectionate needs to full acceptance and the ability to enter into differentiated emotional relationships.

5) Color responses (C) shows the ability to respond emotionally to the outer world with adequate control.

6) Form level of the response (FL). High form level rating indicates the person's ability to have good reality contact.

All of the responses in each category are rated according to the criteria developed by Klopfer. For example, each M response is rated according to the three criteria below and then the average of the three ratings is assigned to the response. This gives the M raw score.

Criteria	Rating
1) Amount of movement in space, described or implied	
a) Increasing living space (dancing, running, talking together, pointing)	1
b) Decreasing living space (bowing, kneeling, crying, crouching, and all HD responses)	½
c) Merely alive (sleeping, lying down, sitting, balancing)	0
2) Freedom in seeing movement	
a) Spontaneously sees action	1
b) Uses intermediary means of representing movement (picture of someone walking)	½
c) Reluctantly given in inquiry or follows only from the logic of the situation	0

Criteria (cont.)   Rating

3) Cultural distance
    a) Real people of immediate cultural milieu   1
    b) Culturally distant real people; culturally
        popular fantasy figures; and figures whose
        clothing or equipment practically conceals
        their human form (Ubangis, Mickey Mouse,
        Superman, Diver in diving suit)   ½
    c) Unusual fantasy figures or culturally and/or his-
        torically extremely distant   0
        (Neanderthal man)

The average ratings of all the M responses are added algebraic-

ally, counting each M- response -1. The resulting raw score is con-

verted into a weighted score by the following table:

M raw score	M weighted score
5 to 10.9	3
3 to 4.9 or 11 to 15.9	2
1 to 2.9 or 16 to 20.0	1
Less than 1 or more than 20.0	0
Less than 0 (any minus score).......	-1

Clues appropriate for the calculation of animal movement (FM),

inanimate movement (m), shading (Sh), color (C), and form level (FL)

are similarly employed. The sum of the weighted scores of the six

Rorschach variables for each patient constitutes the final prognostic

score:

Range	Group	Meaning
17 to 13	I	The person is almost able to help himself. A very promising case that just needs a little help.
12 to 7	II	Not quite so capable as the above case to work out his problems himself but with some help is likely to do pretty well.
6 to 2	III	Better than 50-50 chance; any treatment will be of some help.

Range	Group	Meaning
1 to −2	IV	50-50 chance.
−3 to −6	V	A difficult case that may be helped somewhat but is generally a poor treatment prospect.
−7 to −12	VI	A hopeless case.

The prognostic validity of the RPRS

The research of the last 25 years on the prognostic validity of the RPRS has been summarized by Garwood (1977). He concludes that the RPRS has proven to be an accurate measure of prognosis independent of type of therapy used. A total of 13 studies correlating RPRS total with therapeutic outcome were reported. Eight of these studies, involving 11 different client groups, report significant positive correlations with a successful outcome the correlations between RPRS and therapeutic outcome range from .38 to 80. Five of these studies, on five different client groups, do not report a significant correlation. However, three of these studies report a non-significant positive correlation. One study does not report the sign of the correlation (Whiteley and Blaine, 1967). And in the Bloom (1956) study the sign of the correlation is negative for the underproductive group. The underproductive group is defined as having no more than 10 responses and at least one rejection in the total protocol. In the study presented here only protocols with at least 10 responses and no rejections have been used. The range of responses per protocol is from 10 to 71 ($\bar{X} = 23.2$).

A review of the literature also revealed 10 studies which correlated the RPRS subscores with success in therapy. These studies are

summarized in Table I. Of the 6 RPRS subscores FM is shown to be the least effective predictor of success in therapy. FL is the most effective subscore for predicting success in a schizophrenic population. The variance of the FL score for a non-schizophrenic population can be expected to be small, consequently no significant correlations will be found for non-schizophrenics. M, Sh and C are the subscores most often found to correlate with success and are possibly more effective for non-schizophrenics than schizophrenics. Small m seems to confine itself to a population actually experiencing stress, such as stutterers, prisoners and neurotics. It might be concluded that, when dealing with a diverse population, all RPRS variables except FM are important variables in the prediction of success in therapy.

TABLE 1

STUDIES ON THE RELATIONSHIP OF RPRS SUBSCORES AND SUCCESS IN PSYCHOTHERAPY

	Correlation RPRS total and success	Correlation subscales and success	Client group
Bloom (1956) Normally productive	p < .02 for differences between means	p < .05 for differences between means of sum C	25 psychoneurotic veterans
Underproductive	N.S.	p < .10 for differences between means of sum M	21 same
Cartwright (1958)	.52 (p < .03)	M + C + FL > 3 indicated success Tau + .73 (p > .003)	13 college student outpatients
Edinger et al (1976)	r .31 (NS) for group therapy adjustment (GT)	Sh, small m, C Mult. R .56 (p < .05) for GT	25 male prisoners
	r .37 (NS) for work progress (WP)	Sh and WP r. 42 (p < .05) Mult. R .65 (p < .05) for WP.	
Endicott et al (1964)		FL was least effective as predictor of success	
Treated	.43 (p < .05)	Responses .41 (p < .05) Sh .40 (p < .05) m .40 (p < .02)	21 psychiatric outpatients Armed Forces
Untreated	.38 (p < .05)	Responses .32 (p < .05) C .54 (p < .01)	40 same
Kirkner et al (1953)	.67 (.01)	Small m .45 (p < .01) Sh .45 (p < .01) m .39 (p < .02)	38 neurotics 2 psychotics
Mindess (1953) Full group	.81 -	FL and M	N = 80 including 10 schizophrenic 23 schizoid 26 homosexuals
less 10 schizophrenics	.66 -	- -	N = 70

TABLE I (cont.)

	Correlation RPRS total and success	Correlation subscales and success	Client group
Newmark (1974)			
Behavior mod	.41 (p < .05)	all 6 subscales pos. r, but all n.s.	27 neurotics mainly anxiety and/or depression
Rational emotive	.48 (p < .05)		26 same
Seidel (1960)	.40 (p < .01)	FL .44 (p < .01) M + FL + small m + Sh + C .34 (p < .01)	63 male schizophrenic inpatients (at least 5 responses)
Sheehan et al (1954)	p < .01 for differences between means	Absolute number of each variable, no PPRS rating was used. M, FM, small m, Sh all p ≤ .02 C p ≤ .10 FL and Responses both p ≤ .30	35 adult stutterers
Whitcley et al (1967)	n.s.	Raw Sh for long term p < .05 C for change versus no change (p < .05) Change group n.s. higher on Responses, CF, Fh, Fc, M.	50 male Harvard University student outpatients

CHAPTER III

INTELLIGENCE AND SUCCESS IN PSYCHOTHERAPY
A SUMMARY OF THE RESEARCH

There are two major groups of studies on the relationship between
intelligence and success in psychotherapy. The first group deals with
continuation in therapy and intelligence. Major studies of this sort
are R. A. O'Connell et al, 1972; Salzberg and Bidus, 1966; Garfield
and Affleck, 1961; Garfield and Affleck, 1959. These studies state
that there is a positive relationship between continuation in therapy
and education-intelligence. Garfield and Affleck (1959) state that
education after the 8th grade loses its importance as a predictor for
attrition. These studies do not, however, have direct relevance to
this investigation since they do not deal with intelligence as an in-
trinsic, causive factor in success of psychotherapy and will not be
discussed further here.

The second major group of studies on psychotherapy and intelli-
gence do deal with the intrinsic, causive relationship of intelligence and
ability to predicted benefit from therapy. These studies are, therefore,
directly related to this proposed investigation. Accordingly, they are
reviewed and summarized in the text below and an overview is presented
in Table II.

Although the research in this area is plagued with the problem
that different measures are used to identify success in therapy and by

TABLE II

STUDIES ON PSYCHOTHERAPY AND INTELLIGENCE

	Sample	Measure of success in therapy	Measure of Intelligence	Treatment	Correlation between success and intelligence	Patient variables other than intelligence relating to success in therapy
Barron 1953	33 outpatient psychoneurotics--self-referred	Categorized as improved or unimproved by 2 independent raters using case presentation and clinical chart	Abbreviated Wechsler-Bellevue (Comprehension, Similarities, Block Design Digit Span) mean IQ 117	6 months of individual therapy	r = .46 (p < .01)	1. Ethnocentrism r = -.64 with Intel. held constant partial r = -.34 2. Pos. associated with measure of "Personal Soundness". (Barrow's MMPI "Ego Strength" Scale)
Berger et al 1971	73 psychoneurotics	Successful return to job, family and social practices	Wechsler-Bellevue IQ range not given	2 yrs. of treatment and rehabilitation programs	Significant positive correlation	Index of Social Competency Sign. poss. correlation
Harris and Christiansen 1946	53 inpatients with delayed covery from physical illness	Classified as having; 1) good, 2) indifferent, 3) poor prognosis by experienced therapist based on history, observed behavior, self report and state of physical symptoms. (Test results not used for prognostic rating.)	Abbreviated Wechsler-Bellevue (Barron 1953) mean IQ 108, s - 16.7	Five 45 sessions of psychoanalysis	No. sign. diff. in Mean IQ between improved (110) and unimproved (112)	Poor prognostic group hypothesized to have 1. Ego-inflation-victimization 2. Sub-clinical psychotic trend 3. Lack of modifiability
Salzberg and Bidus (1966)	100 inpatient male veterans	Discharge without return to hospital. This was pos. corr. with the group therapy screening scale (F 10.27; p < .05)	Self-reported demographic data, as part of the 10 item group therapy screening scale	Group therapy	Intellectual achievement consisting mostly of verbal skills accounted for 26.4% of the variance when the group screening scale was factor analysis.	Factor analysis of Screening Scale resulted in 3 more factors 1. premorbid adjustment of social adaptability (17.12) 2. Ability to recognize and accept responsibility for one's problems (11.3%) 3. A psychological rather than somatic attitude towards treatment (10.6%)

the use of different measures of intelligence, based upon previous research it seems that intelligence has a positive correlation with success in therapy. The question of the nature and degree of the relative contributions of intelligence and non-intelligence factors to a favorable prognosis for therapy has been examined in this study through a joint factor analytic study of the RPRS and the WAIS.

CHAPTER IV

IQ AND RPRS - A SUMMARY OF THE RESEARCH

Four studies dealing with IQ and RPRS have been found. They are
summarized in Table III. Based upon these studies it seems reasonable
to expect that IQ is related to prognosis and that a positive correla-
tion between IQ and favorable prognosis will be found if a sample with
a diversity in IQ score is used.

It is interesting to note that Williams et al (1967) found that in
the absence of an objective prognostic rating (e.g., the RPRS) the
social workers in his study used the parents' report of the child's
success in school as a measure of prognosis. The correlation between the
social workers' prognostic rating, based on interviews with the parents,
and the five psychologists' ratings based on RPRS, was .102 and .285 for
the total sample (both non significant).

The Weiss and Edinger (1974) study is the immediate predecessor of
the proposed investigation. They accepted the RPRS as a valid measure
of the prognosis for success from psychotherapy and found significantly
positive overall correlations between the RPRS and the WAIS and especial-
ly high correlations between RPRS and a combination WAIS verbal sub-
scores. The Weiss and Edinger sample consisted of 15 male hospitalized
process schizophrenics and 15 male college students. The correlation

TABLE III

STUDIES OF RELATIONSHIP OF IQ AND RPRS

	Sample	IQ Test	Correlation between IQ and RPRS
Bloom (1956)	Psychoneurotic veterans A. 25 normally produc- tive B. 21 underproductive	WAIS means: A. Improved 120.1 unimproved 104.6 B. Improved 109.7 Unimproved 108.6 Years of education means: A. Improved 13.5 Unimproved 10.1 B. Improved 11.7 Unimproved 9.8	A. N.S. B. N.S. A. p < .01 B. p < .10
Edinger and Weiss (1974)	A. 15 male process schizophrenics B. 15 male College students	WAIS range not given	A. r = .679 (p < .01) B. r = -.0059 n.s. total sample r = .722 (p < .01)
Newmark et al (1974)	67 white Ss (mean age) 27.3) with neurotic sym- ptomatology and/or de- pression.	IQ test and IQ range not given	The improved Ss in group B (but not in group A) showed a n.s. higher IQ than unimproved Ss (p < .10)
Williams et al (1967)	A. 27 Caucasian children B. 15 Negro children	IQ test and IQ range not given	A. r = .401 and .428 (p < .05) B. r = -.314 and -.449 n.s. Total sample r = 0

between visual-spatial ability, verbal ability, and RPRS scores was calculated. The visual-spatial ability was measured by the Object Assembly and Block Design of the WAIS (OABD). The verbal abilities were measured by the Vocabulary Information and Similarity subtests of the WAIS (VIS). For the entire group, the OABD to RPRS correlation was .518 (p < .01) and the VIS to RPRS correlation was .714 (p < .01). For the college group above, no significant correlations were found. For the process group the correlation between VIS and RPRS was .630 (p < .05). These results indicate that verbal abilities as measured by the Vocabulary, Information and Similarity subtests are highly cor-related with favorable prognosis if the sample used is a heterogeneous one. Weiss and Edinger concluded that the general intelligence factor, "g", might in part be measured by the RPRS and suggested a factor analytic study of the RPRS "in order to understand its unusual effectiveness as a prognostic indicator in psychotherapy". This study responds to that suggestion.

CHAPTER V

METHOD

Introduction

Following the suggestion of Edinger and Weiss (1974) the major analytic technique employed in this study is factor analysis. This technique is applied to groups of variables selected from among the 23 variables listed in Table IV. A precedent for the application of the factor analytic technique to the general problem area of psychotherapy screening and especially to identifying the role of intelligence as a predictor of success in therapy has been provided by Salzberg and Bidus (1966). In their study they analyzed a 10 variable Group Psychotherapy screening scale and found that it included four factors, the first of which was an intellectual achievement factor involving mostly verbal skills.

In addition to factor analysis, descriptive statistics (means and standard deviations) are presented for each of the 23 variables included in the study (Table V). The table of intercorrelations for these variables is also presented and correlations significant at either the .01 or .05 levels are so identified (Table VI). Table VI[A] presents the intercorrelations for the WAIS subscales from the WAIS manual.

In the remainder of this chapter the data analyzed and the factor analytic techniques employed are reviewed. The results of application of the correlations and the factor analysis to the testing of each hypothesis in the study will be discussed in the following chapter.

TABLE IV

VARIABLES USED IN THIS STUDY

Possible Range

```
V    1.  RPRS total.......................................-12 to 17
A
R    2.  Human movement (M)...............................-1 to 3
I
R  P A    3.  Animal movement (FM)............................-2 to 1
R  R B
R  S L    4.  Inanimate movement (m)..........................-1 to 2
S     E
      S    5.  Shading (Sh)....................................-3 to 3

     6.  Color (C).......................................-3 to 3

     7.  Formlevel rating (FL)...........................-2 to 5
```

Mean and Standard Deviation
from WAIS Manual

```
       8.  WAIS Full Scale Score (FSIQ)...................m=100, s=15

W      9.  WAIS Verbal Score (VIQ)........................m-100, s=15
A
I     10.  WAIS Performance Score (PIQ)...................m=100, s=15
S
      11.  Vocabulary, Informator and Similarities (VIS)..m=10, s=3

V     12.  Object Assembly and Block Design (OABD)........m=10, s=3
A
R     13.  Information (I).................................m=10, s=3
I
A     14.  Comprehension (Comp)...........................m=10, s=3
B
L     15.  Arithmetic (A).................................m=10, s=3
E
S     16.  Similarities (S)...............................m=10, s=3

      17.  Digit Span (DS)................................m=10, s=3

      18.  Vocabulary (V).................................m=10, s=3

      19.  Digit Symbol (D sym)...........................m=10, s=3

      20.  Picture Completion (PC)........................m=10, s=3

      21.  Block Design (BD)..............................m=10, s=3

      22.  Picture Arrangement (PA).......................m=10, s=3

      23.  Object Assembly (OA)...........................m=10, s=3
```

(Age, which was the only socio-demographic variable available,
is included in the descriptive and bivariate correlational
analyses.)

TABLE V

MEANS AND STANDARD DEVIATIONS
FOR WAIS AND RPRS VARIABLES

FROM THE STUDY SAMPLE

N = 52

VARIABLE	MEAN	STD. DEV.
AGE	25.558	8.735
RPRS	5.550	3.991
M	1.385	1.032
FM	.173	.834
m	.865	.742
Sh	1.174	1.811
C	1.169	.863
FL	.784	.474
R	23.212	13.827
FSIQ	111.000	15.732
VIQ	111.846	16.221
PIQ	108.269	17.010
VIS	12.312	3.035
OABD	11.385	3.534
I	11.750	2.943
Comp	12.442	4.552
A	10.539	3.190
S	12.635	3.396
DS	10.962	3.395
V	12.539	3.489
D sym	11.077	3.839
PC	10.712	2.789
BD	11.558	3.691
PA	10.365	3.326
OA	11.212	3.892

TABLE VI

CORRELATION MATRIX OF THE WAIS VARIABLE
RPRS VARIABLES AND AGE
FROM THE STUDY SAMPLE

	RPRS	M	FM	Small m	Sh	C	FL	FSIQ	VIQ	PIQ	VIS	OABD
M	.75**											
FM	.77**	.65**										
Small m	.43**	.17	.20									
Sh	.82**	.43**	.48**	.28*								
C	.63**	.39**	.40**	.19	.31*							
FL	.51**	.37**	.44**	-.04	.27*	.41**						
FSIQ	.66**	.62**	.43**	.17	.52**	.39**	.45**					
VIQ	.66**	.59**	.43**	.23*	.50**	.41**	.44**	.92**				
PIQ	.52**	.51**	.34**	.08	.44**	.28*	.37**	.88**	.62**			
VIS	.61**	.52**	.39**	.27*	.44**	.40**	.44**	.86**	.94**	.56**		
OABD	.51**	.48**	.34**	.13	.43**	.28*	.26*	.82**	.58**	.92**	.55**	
I	.50**	.43**	.25*	.27*	.40**	.32*	.31*	.81**	.90**	.53**	.91**	.52**
Comp	.63**	.57**	.50**	.22	.50**	.33**	.35**	.74**	.83**	.46**	.78**	.41**
A	.52**	.46**	.29*	.17	.39**	.44**	.34**	.74**	.79**	.52**	.70**	.52**
S	.56**	.47**	.38**	.21	.41**	.36**	.45**	.71**	.80**	.46**	.91**	.44**
DS	.37**	.41**	.28*	.03	.30**	.16**	.26*	.68**	.64**	.57**	.46**	.55**
V	.61**	.54**	.43**	.26*	.41**	.43**	.44**	.85**	.93**	.57**	.95**	.56**
D sym	.14	.15	.04	-.06	.22	-.08	.21	.41**	.18	.60**	.10	.45**
PC	.48**	.56**	.39**	-.05	.30*	.40**	.32*	.71**	.54**	.75**	.52**	.66**
BD	.50**	.46**	.32*	.10	.40**	.35**	.31*	.75**	.54**	.85**	.50**	.93**
PA	.49**	.41**	.34**	.07	.40**	.30*	.40**	.71**	.51**	.80**	.48**	.74**
OA	.45**	.44**	.31*	.14	.41**	.43**	.18	.77**	.55**	.88**	.52**	.94**
Age	.16	.05	.13	.06	.23*	-.03	.06	.08	.09	-.01	.24*	-.04

	I	Comp	A	S	DS	V	D sym	PC	BD	PA	OA
Comp	.68**										
A	.77**	.50**									
S	.72**	.68**	.51**								
DS	.52**	.39**	.49**	.28*							
V	.85**	.82**	.68**	.80**	.51**						
D sym	.12	.18	.12	.06	.38**	.10					
PC	.46**	.46**	.47**	.44**	.35**	.54**	.29*				
BD	.48**	.31*	.52**	.41**	.51**	.50**	.33**	.64**			
PA	.42**	.40**	.41**	.40**	.39**	.49**	.32**	.58**	.68**		
OA	.48**	.44**	.46**	.42**	.51**	.55**	.50**	.59**	.74**	.69**	
Age	.23*	.22	.02	.19	.13	.24*	-.19	-.13	-.06	-.04	-.02

* Correlation p < .05

** Correlation p < .01

TABLE VI[A]

INTERCORRELATION OF WAIS SUBSCALES

FROM WAIS MANUAL

	I	Comp	A	S	DS	V	D sym	PC	BD	PA	OA	VIQ	PIQ	FSIQ
Comprehension (Comp)	.70													
Arithmetic (A)	.66	.49												
Similarities (S)	.70	.62	.55											
Digit Span (DS)	.53	.40	.49	.46										
Vocabulary (V)	.81	.73	.59	.74	.51									
Digit Symbol (D sym)	.57	.44	.43	.53	.41	.60								
Picture Completion (PC)	.67	.56	.50	.56	.39	.61	.48							
Black Design (BD)	.58	.49	.51	.52	.39	.53	.47	.62						
Picture Arrangement (PA)	.62	.57	.49	.52	.47	.62	.51	.57	.58					
Object Assembly (OA)	.45	.43	.37	.39	.30	.43	.44	.54	.61	.52				
VIQ	.84	.71	.67	.75	.56	.84	.61	.67	.62	.67	.48			
PIQ	.73	.63	.58	.64	.49	.70	.58	.69	.71	.68	.65	.77		
FSIQ	.84	.71	.66	.74	.56	.82	.63	.72	.69	.72	.58	--	--	
Mean	10.3	10.2	10.1	10.1	10.0	10.2	9.9	10.0	10.0	9.7	10.0	60.8	49.5	110.4
SD	2.9	3.0	3.1	3.0	3.0	3.0	3.1	2.9	3.1	2.7	2.9	14.6	11.7	24.8

The Sample

The sample selected for this study contains a large variety of subjects to insure maximum variance of all the variables used. Comrey (1973, p. 202) states that "for exploratory work, it is much more important to insure that there is plenty of variance on the factor in the sample than it is to have a representative sample from the population at large."

The sample consisted of 52 subjects, who were either in therapy or applying for therapeutic treatment. Presented problems varied from psychotic reactions to marital difficulties. Twenty-eight clients were identified as in-patients and seventeen as out-patients. Thirty-five of the 52 subjects were female and 17 were male. The range of ages was from 17 to 52, the mean age was 25.6 (s = 8.7). Thirty-six of the subjects came from the Portland Metropolitan area, specifically from the Cedar Hills Psychiatric Center and Clinic (19), the Portland State University Psychology Clinic (12), the Dammasch State Hospital (3), and the Vancouver Veterans Hospital (2). Eighteen of the subjects were drawn at random from a file of 2000 subjects at the Rorschach Workshops, Bayville, New York. Both the Rorschach and the WAIS were administered to each client within 2 weeks of each other for 49 of the clients. For 2 of the clients the tests were separated by 6 months, because of an interruption in therapy, and for 1 client the tests were separated by 2 months. In all these 3 cases the Rorschach preceded the WAIS.

Data Collection

All subjects had a Rorschach protocol of at least 10 responses with

no rejections (Bloom 1956). Rejections were only allowed if the pro-
tocol had more than 10 responses. The mean number of responses was
23.2 (s = 13.8). Each Rorschach protocol was scored and each scored
response rated by two independent raters according to the instructions
for the RPRS (Klopfer 1954). The interrater reliability, as measured
by the Pearson r between the 2 raters total RPRS score for all 52 sub-
jects, was .95. When there was a difference in the rating for one of
the 6 subscores (M, FM, m, Sh, C and FL) the average of the raw scores
was taken. These raw scores were converted to weighted scores and ad-
ded to arrive at the total RPRS score. Only full WAIS protocols were
used so that FSIQ, VIQ and PIQ could be calculated for all the subjects.

Analytic Procedures

Standard bivariate correlational techniques and tests of signif-
icance were applied to the data to identify significant relationships
between pairs of the 23 variables. Moreover, factor analytic tech-
niques were employed to determine whether selected subsets of the var-
iables in the study could be reduced to a smaller number of common
factors and thereby to determine the basic dimensions or relationships
among these variables and the aggregate variables constructed from
them, especially the relationships of RPRS to intelligence.

The number of factors to be rotated was arrived at by following
Cattell's (1966, p. 297) and Harman's (1960, p. 85) suggestion of using
a combination of Kaiser's criterion ("rotate as many factors as there
are eigenvalues greater than or equal to unity"). Factor analyses were

performed using both unity (principal component analyses) and squared

multiple correlations (principal factor analyses) estimates of the

communalities. The factor analytic results are reported mainly in

terms of the principal factor model since it best reproduces the ob-

served correlations rather than merely extracting the maximum variance

as does the principal components model. The decision to favor the

principal factor results is also in accord with Cattell's rejection

of the principal components model for general scientific research be-

cause of the unlikelihood of any "real" variables containing in them-

selves all sources of their variation as that model assumes. This is

certainly unlikely with either of the two main sets of variables with

which this study deals or with any of the subsets of them. No differ-

ences are expected to occur between the principal component and princi-

pal factor analysis. Varimax rotation after Kaiser normalization was

employed, as a variety of authors suggest, in order to approach simple

structure.

Hypotheses

Hypothesis I. (Degree of relatedness of the overall RPRS and

WAIS measures): The degree of relationship between performance on

the RPRS and the WAIS is moderate and positive.

This hypothesis about the overall relatedness of the RPRS and

intelligence will be tested by examining for significance the corre-

lation between the two variables RPRS total and WAIS total.

Hypothesis II. (Degree of relatedness of the overall RPRS and

the WAIS verbal and performance subscores). The correlation between

the RPRS total and the WAIS Verbal IQ is positive and higher than the

correlation between RPRS and the WAIS Performance IQ.

This hypothesis will be tested by examining for significance and relative magnitude, the correlations between the RPRS total and the WAIS Verbal IQ and between the RPRS total and the WAIS Performance IQ. A t-test will be used to determine whether the difference between these two correlations is significant.

Hypothesis III. (Replication of the Weiss and Edinger, 1974, study). The correlation between the WAIS Vocabulary, Information and Similarities sub-tests combined (VIS) and the RPRS total is positive, significant and greater than the correlation between the WAIS Object Assembly and Block Design sub-tests combined (OABD) and the RPRS total (which is also, however, positive and significant).

This hypothesis will be tested by examining for significance and relative magnitude the correlations between the VIS and the RPRS and between the OABD and the RPRS. A t-test will be used to determine whether the difference between these two correlations is significant.

Hypothesis IV. (The role of intelligence in the RPRS). The first factor in the RPRS and the one making the major contribution to the total variance measured by that scale is a general intelligence factor.

The analysis here consisted of two principal factor analyses with varimax rotation. The first analysis was of the six RPRS sub-scores. Its results will be examined to determine the factor structure of the scale and the percentages of common variance attributable to each factor. The second analysis was the same as the first except with

the inclusion of the WAIS total score as a marker variable in order to identify which of the factors in the RPRS factor structure is most closely related to general intelligence.

A third factor analysis was conducted on the six RPRS subscores along with the WAIS verbal and performance subscores now serving in the role of marker variables to determine the nature of the relations between the RPRS subscales and verbal and performance intelligence.

Hypothesis V. (Identification of the nonintelligence factors in the RPRS. There are nonintelligence as well as intelligence factors measured by the RPRS.

To test this hypothesis the results of the same three factor analyses described above will be examined to determine whether or not there are factors in the RPRS factor structure significantly related to intelligence and which RPRS subscales define them.

Two final exploratory factor analyses were conducted using, first, all 23 variables of Table IV, and second, only the six RPRS subscores and the eleven WAIS subscores. The results of these analyses will be used to identify possible future directions for research.

Significance

It is hoped that the results of this study will add to specific understanding of the reasons for the utility of the RPRS as a predictor of success in psychotherapy and lead to further research for understanding the conditions which contribute to the success of therapeutic interventions. A model of this larger framework is provided in Figure 1.

26

Figure 1

Figure 1
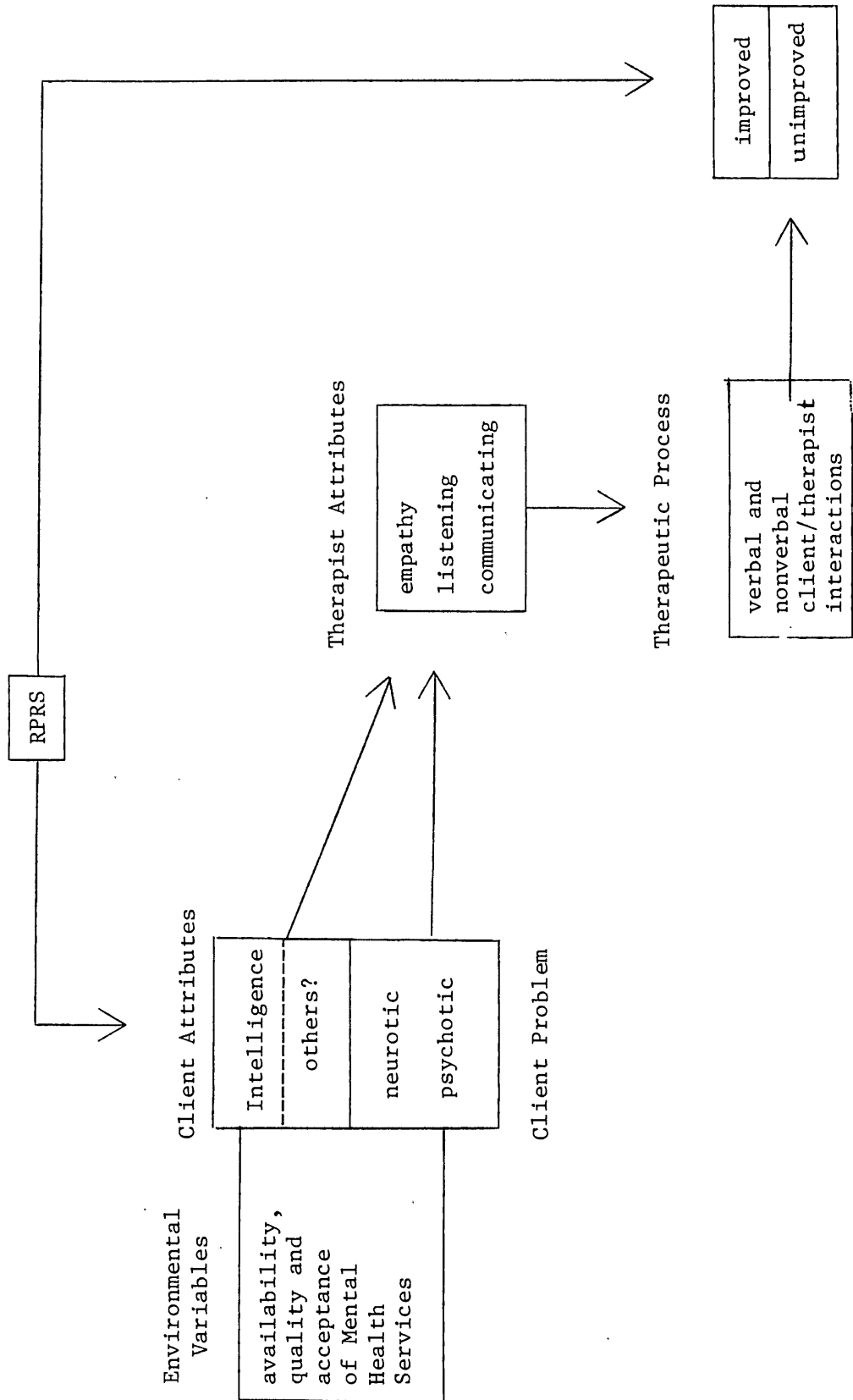
This model shows that client variables, environmental varia-
bles and client problems are important components in a client's
decision to seek therapy. The client attributes and problems inter-
act with the therapist's attributes which together, through the
therapeutic process, result in an outcome of therapy. This outcome
can be defined as improved or unimproved. The RPRS attempts to
measure client variables which have an effect on the outcome of
therapy.

This thesis attempts to identify and assess the impact of those
client variables measured by the RPRS. Greater understanding of these
variables and their effects on the outcome of therapy can have implica-
tions for the prediction of the success of therapy, the selection of
clients, theoretical understanding of the therapeutic process and the
design of more effective therapeutic treatments.

CHAPTER VI

RESULTS

This chapter presents the results of the quantitative analyses performed. The forms of analysis as mentioned before, include descriptive statistics, correlations and factor analysis. The quantitative results of these analyses for the appropriate variables will be presented along with such technical explanation and immediate interpretation as is necessary for a clear reading of the results. In depth interpretation of the results is reserved for the following chapter.

Descriptive Statistics

Means and standard deviations for each of the 23 variables and for age as well are given in Table V. This sample has a somewhat higher FSIQ than one would expect to find in a random sample of the general population, namely 111 versus 100. The mean RPRS score of 5.55 with a standard deviation of 3.00 shows that prognostic groups I through IV (Klopfer 1954) are represented in this sample. Of the 52 subjects, 68% fall in groups II and III. This is the distribution found in other studies dealing with the RPRS (Garwood 1978). Prognostic group V and VI which Klopfer describes as "poor treatment prospect" and "hopeless case" respectively, have rarely been found in previous research. In a review of 11 different studies using a total of 481 clients only 1 client was mentioned to belong to prognostic group V and 4 to group VI. No restrictions on the number of responses in the

Rorschach was noted for the 2 studies reporting these clients
(Filmer-Bennett, 1955; Johnson, 1953). It is unlikely that a valid
Rorschach protocol (one with at least 10 responses and no rejections)
can be obtained from such cases. The subjects in this sample were
also required to produce a complete WAIS protocol so that FSIQ, VIQ
and PIQ could be calculated.

Correlations

The purpose of this subsection is to evaluate the appropriateness
of these data for use in later factor analysis. Specifically, the in-
tercorrelations of the WAIS, RPRS and age variables will be examined
in light of correlations found in past research.

The intercorrelations for the 23 variables plus the age variable
are given in Table VI. The WAIS manual gives a table of intercorrela-
tions of the WAIS scales which is presented in Table VI-A. The table
of correlations for the 25-34 age group has been used, since it best
represents the present sample. The correlations found in this study
are congruent with the ones given in the WAIS manual, except for the
D sym sub-test. The correlations of the D sym with the verbal sub-
tests are consistently lower here. D sym involves the ability to
master a new and essentially alien task within a brief time span.
Through middle age, this test is one of the poorest measures of gen-
eral intelligence (G). The largest discrepancy is found between D sym
and Similarities (.06 for this study versus .53 from WAIS manual). Sim-
ilarities ranks as a good measure of G. This seems to indicate that the
present sample varies from the WAIS manual sample in the specific abil-
ities measured by D sym. Zimmerman and Woo-Sam (1973) state that the

particular aspects of the intelligence evaluated by the D sym seems
to vary across age group and diagnostic group. Saunders (undated)
defines D sym as a measure of "psychometabolic rate" influenced by
such variables as drugs, brain damage and psychological state. Wech-
sler (1958, pp. 171-172) states that in schizophrenia and anxiety
state reaction the expectation is that scores should deviate 1.5 to
2.5 units below the mean sub-test scores. The results of the present
study confirm that the D sym sub-test is sensitive to the psycholog-
ical state of the person. In contrast to the sample used in the WAIS
manual, the present sample consisted of persons in need of therapeutic
assistance. Some of the subjects were on prescribed drugs when the
test was taken.

The age variable has been included in the correlation matrix
and is shown to be slightly negatively correlated with the WAIS per-
formance subscales and with C. Although none of these correlations are
significant it does tend to confirm the validity of the data used. Age
is shown to be positively correlated with shading (Sh) ($r = .23$ $p \leq .05$).
In their review of the research on State and Trait anxiety, Auerbach and
Spielberger (1972) state that the shading variable is the best Rorschach
indicator of state anxiety. Shading, namely Klopfer's FK score, is
also assumed to be related to introspection (Klopfer et al 1954). No
empirical studies dealing with this subject have been found.

The correlation between M and FSIQ needs special mention because
of the previous research done on the relationship between human move-
ment (M) and intelligence. High M has been found to indicate above

normal intelligence (Auerbach and Spielberger 1972) and is positively correlated with independent measures of intelligence (Hirt 1972). In the present study M was found to correlate higher with FSIQ than any of the other RPRS subscales. The correlation of .616 ($p < .001$) indicates that approximately 38% of the variance in M can be accounted for by FSIQ.

Factor Analysis

The results of the varimax rotated, principal factor analyses on five different sets of variables are presented in Tables VII, VIII, IX, X, and XI. Principal component (P.C.) analyses were also done to allow for comparisons with the results found in the principal factor (P.F.) analyses. The factor loadings of the principal factor analysis were generally somewhat lower than the factor loadings of the P.C. analysis. This is explained by the fact that in P.C. analysis all variance, including specific and error variance is accounted for as common variance. In principal factor analysis specific and error variance are excluded from the common variance. The principal component in general confirmed the results found in P.F. analysis, except in the last factor analysis (RPRS subscores and WAIS subscales). These difference will be discussed in the following chapter.

Only variables with a factor loading of .50 or larger are used to interpret the results of the factor analysis. This is recommended by Comrey (1973, p. 200) when the sample is small. A sample of 52 has a low reliability of the correlation coefficients. To compensate for this the higher factors loading of $\geq$ .50 will be used to interpret the results.

TABLE VII

FACTOR MATRIX OF THE 6 RPRS SUBSCALES

(Varimax Rotation)

N = 52

	FACTOR 1	FACTOR 2
M	.6463	.3622
FM	.7044	.3850
m	.0310	.5211
Sh	.4257	.4734
C	.5221	.2050
FL	.7093	− .1189

TABLE VIII

FACTOR MATRIX OF THE 6 RPRS SUBSCALES

(Varimax Rotation)

N = 52

	FACTOR 1	FACTOR 2
M	.5670	.5170
FM	.5677	.4646
m	-.0016	.4373
Sh	.3650	.5671
C	.4827	.2718
FL	.8212	-.0851
FSIQ	.5787	.4492

TABLE IX

FACTOR MATRIX OF THE

6 RPRS SUBSCALES, VIQ AND PIQ

(Varimax Rotation)

N = 52

	FACTOR 1	FACTOR 2
M	.6806	.3462
FM	.6266	.2999
m	.0516	.4986
Sh	.4727	.4903
C	.5127	.1748
FL	.7200	.1632
VIQ	.6852	.3696
PIQ	.5965	.2393

TABLE X

FACTOR MATRIX OF ALL 23 VARIABLES

(Varimax Rotation)

N = 52

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
RPRS	.3149	.2503	.8729	.3351
M	.3214	.3033	.6195	.0747
FM	.1507	.1430	.7816	.0789
m	.1787	−.0352	.1558	.7912
Sh	.2314	.2809	.5252	.3320
C	.2671	.0755	.5530	.0151
FL	.2931	.1432	.5379	−.3107
FSIQ	.6917	.6524	.3066	.0247
VIQ	.8849	.3136	.3117	.0682
PIQ	.2968	.9217	.2376	−.0169
VIS	.9220	.2316	.2693	.0805
OABD	.2833	.9044	.1890	.1139
I	.8866	.2638	.1049	.1380
Comp	.6803	.1783	.4003	.0959
A	.6439	.3144	.2364	.0518
S	.7544	.1513	.3229	.0345
DS	.3925	.4849	.1275	−.0115
V	.8590	.2655	.3083	.0684
D sym	−.0090	.5789	−.0095	−.0581
PC	.3242	.5689	.3539	−.1642
BD	.2604	.7858	.2461	.0339
PA	.2511	.6681	.3026	−.0330
OA	.2807	.8532	.1186	.1612

TABLE XI

FACTOR MATRIX OF THE 6 RPRS SUBSCALES
AND 11 WAIS SUBSCALES

(Varimax Rotation)
N = 52

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
M	.2936	.2902	.5578	.3250
FM	.1452	.1190	.8080	.2743
m	.2867	−.0366	.1829	−.0187
Sh	.3133	.2869	.4417	.1188
C	.2223	−.0129	.2855	.6079
FL	.2025	.1588	.3136	.3823
I	.8944	.2839	−.0048	.2537
Comp	.6863	.2273	.4657	.0852
A	.5883	.2979	.0611	.4181
S	.6700	.1648	.2681	.2901
DS	.3346	.5171	.1189	.1134
V	.8204	.2753	.2526	.3086
D sym	−.0183	.6211	.0614	−.1260
PC	.2083	.5117	.2157	.4848
BD	.1825	.7057	.0925	.4716
PA	.1781	.6207	.2021	.3697
OA	.2654	.8387	.1613	.1185

CHAPTER VII

CONCLUSIONS

This chapter will be chiefly devoted to applying the results of the data analysis on the five research hypotheses. Some additional ideas suggested by the results but extending beyond the framework established by the hypotheses will be presented at the end of this chapter.

Conclusions about the Hypotheses

Hypothesis I. (Degree of relatedness of the overall RPRS and WAIS measures): the degree of relationship between performance on the RPRS and the WAIS is moderate and positive.

The correlation between the two variables RPRS total and WAIS total is found to be .6575 (p < .001). This confirms the first hypothesis (See Table VI, page 19).

Hypothesis II. (Degree of relatedness of the overall RPRS and the WAIS verbal and performance subscores): the correlation between RPRS total and the WAIS Verbal IQ is positive and higher than the correlation between RPRS and WAIS Performance IQ.

The correlation between RPRS total and WAIS Verbal IQ was found to be .6552 (p < .001) and between RPRS total and WAIS Performance IQ .5236 (p < .001) (See Table 6). The t-test for differences between these

two correlations resulted in t = 1.42, df = 49 (p < .10).   This does

not confirm the second hypothesis, since the significance level is

only .10.

Hypothesis III.   (Replication of the Weiss and Edinger, 1974

study):   the correlation between the WAIS vocabulary, Information and

Similarities subtests (VIS) and the RPRS total is positive, significant

and greater than the correlation between the WAIS Object Assembly and

Block Design subtests combined (OABD) and the RPRS total (which is also,

however, positive and significant).

The correlation between VIS and RPRS was found to be .6045

(p < .001).   The t-test for differences between these two correlations

resulted in t = .93, df = 49 (p > .10), indicating that although the

VIS correlation is somewhat higher than the OABD correlation, this dif-

ference is not significant at the <.10 level.   Therefore, the third

hypothesis could not be confirmed.

Weiss and Edinger (1974) do not report a t-test for differences

between the two correlations.   The VIS, OABD correlation needed to com-

pute the t-test was not reported either.   The question whether the Weiss

and Edinger study showed a significant difference remains.

Hypothesis IV.   (the role of intelligence in the RPRS):   the first

factor in the RPRS and the one making the major contribution to the

total variance measured by that scale is an intelligence factor.

Hypothesis V.   (identification of the non-intelligence factors in

the RPRS):   there are non-intelligence as well as intelligence factors

measured by the RPRS.

To test these 2 hypotheses Principal Factor analyses were conducted. The first was on the 6 RPRS subscores alone; the second was on the 6 RPRS subscores with the WAIS total score (FSIQ); and the third was on the RPRS subscores with the two WAIS subscores (See Tables VII, VIII & IX, pages 32, 33 & 34). Factor analysis of the 6 RPRS subscores alone resulted in the identification of 2 factors. Of the 6 RPRS variables, four group solidly together on the first factor which accounts for 83.6% of the extracted common variance (Table VII). Those 4 variables are in order FL, M and C. Only small m is obviously a determinant of the second factor which accounts for 6.4% of the extracted common variance. Sh straddles the two factors almost equally. Moreover, its lack of any factor loading above .5 adds to its ambiguity.

The PF factor analysis of the 6 RPRS variables with the inclusion of FSIQ also resulted in 2 factors (Table VIII). The results of this analysis show that the first RPRS factor is indeed an intelligence factor. The order of the 4 RPRS variables assigned to intelligence in terms of the strength and clarity of their relationship to intelligence is accordingly FL, FM, M and C. The second non-intellective factor is primarily defined by small m. In this second analysis Sh revealed itself by a factor loading above .5 on the second factor as more obviously predominantly also non-intellective. FM and M although still primarily aligned with the first intellective factor, were confirmed as "straddlers" between the first and second factors. Since C in this analysis does not have factor loadings above .5 on either factor in this analysis (.48, .27) and barely did so in the previous analysis

(.52, .20), its alignment is ambiguous.

Finally, the Principal Factor analysis of the RPRS subscales
and the two WAIS subscales VIQ and PIQ resulted again in 2 factors.
The first factor remains an intelligence factor with VIQ and PIQ
almost equally aligned with it. Of the 6 RPRS variables, FL again
emerges as the most intellective of the RPRS variables, followed, in
order, again by M and FM. The remaining second factor is a non-in-
tellective factor which is chiefly defined by small m. The Sh var-
iable is confirmed to have substantive non-intellective qualities, and
C remains shrouded in mystery.

From the three factor analyses the following conclusions may be
drawn concerning the final two hypotheses:

1. The first factor of the RPRS is an intelligence factor
    (confirmation of Hypotheses IV). This factor accounts
    for approximately 85% of the common variance. The most
    intellective RPRS variable is FL, followed by FM and M
    in that order.

2. There is a non-intelligence factor in the RPRS (confirma-
    tion of Hypotheses V). Small m is the most obviously non-
    intellective RPRS variable. Sh is the only other RPRS
    variable possibly possessing a substantive, non-intellective
    dimension. FM and M do, however, possess some non-intellec-
    tive aspects.

3. The status of C with respect to intelligence is ambiguous.

Conclusions about the Exploratory Factor Analyses

Two final factor analyses were conducted to explore possible future
directions for research. The first factor analysis involved all 23 var-
iables of Table IV. Principal factor analysis resulted in 4 independent
factors after varimax rotation (See Table X). The first factor is a

verbal intelligence factor and accounts for 71.5% of the common var-
iance. Of the 16 WAIS variables, the Information (I) subscale is the
variable which best defines this factor, followed in order by VIQ.
None of the 7 RPRS variables have a factor loading of $\geq$ .29. These
are M, RPRS, FL. The second factor is a performance intelligence
factor and accounts for 14.0% of the common variance. The most im-
portant determinants of this factor are in order: PIQ, OABD, OA,
BD, PA. Of the 16 WAIS variables, D sym seems to be the variable
most determined by this factor. In absolute value of factor load-
ings this variable only ranks number 7 on this factor, but the ab-
solute value of the factor loadings on the other 3 factors is extreme-
ly low for this variable. None of the 7 RPRS variables have factor
loadings of $\geq$ .50 on this factor. The RPRS variables loading $\geq$ .28
are M (.30) and Sh (.28). Factor 3 is the RPRS factor and accounts
for 9.1% of the common variance. FM seems to be the most important
determinant of this factor followed by RPRS, M, C, FL and Sh. None
of the WAIS variables have a factor loading $\geq$ .50 on this factor.
The WAIS variables loading $\geq$ .35 are Comp (.40) and PC (.35). Factor
4 is, like the last factors in the previous analyses, mainly determin-
ed by small m. It shows itself clearly to be a non-intellective fac-
tor. The conclusions from this analysis can only be tentative, since
factor analysis of a large number of variables requires a larger sample
than used in this study. The conclusions are:

1. Small m separates itself from the other 5 RPRS subscales
   as an independent non-intellective variable. Sh is the
   only other RPRS subscore with a substantive non-intellec-
   tive dimension; thus, confirming the results of the
   previous factor analysis.

2. The WAIS variable I is the most factorially pure contri-
    bution to the verbal intelligence factor.

3. M and FL and maybe C and Sh are to some small degree
    contributors to the verbal intelligence factor.

4. The WAIS subscales which are important contributors
    to the performance intelligence factor are OA, BD
    and D sym. Of these variables D sym is the most
    factorially pure variable on this factor.

5. M and Sh are to some small degree contributors to the
    performance intelligence factor.

6. FM is the main determinant of the RPRS factor and the
    most factorially pure RPRS variable after small m. The
    other contributors to the RPRS factor are in order: RPRS,
    M, C, FL, Sh.

7. The WAIS variables which contribute most to the RPRS
    factor are Comp and PC.

These conclusions are supported by the PC factor analysis.

The second exploratory factor analysis involving the 6 RPRS sub-

scales and the 11 WAIS subscales resulted in 4 independent factors after

varimax rotation (See Table XI). The first factor is a verbal intelli-

gence factor accounting for 71.2% of the common variance. Of the 11

WAIS subscales the Information subscale again emerges as the variable

which best describes this factor, followed in order by V, S and Comp.

None of the 6 RPRS subscales have loadings $\geq$ .50 on this factor. Three

of the RPRS subscales have loadings $\geq$ .50 on this factor. Three of the

RPRS subscales have loadings $\geq$ .29, namely small m, Sh and M. The sec-

ond factor is a performance intelligence factor and accounts for 13.7%

of the common variance. Again D sym seems to be the WAIS variable which

is best described by this factor: it ranks number 3 as the variable

with the highest factor loading, but the correlations of this variable

with the other factors is extremely low; the other WAIS variables
which are important contributors to this factor are OA, BD, PA and
DS. None of the 6 RPRS subscores have loadings $\geq$ .50 on this factor.
Two of the RPRS variables have loadings of $\geq$ .29; namely Sh and M.
The third factor is the RPRS factor and accounts for 9.7% of the
common variance. The main determinant of this factor is FM, fol-
lowed in order by M, Sh, the WAIS subscale Comp, FL and C. In the
previous analyses Comp shows itself as the most important WAIS var-
iable on the RPRS factor. PC was indicated as the second most im-
portant WAIS variable on this factor. In this analysis PC does not
reveal itself on the third factor but is straddled between the second
and fourth factor. The fourth factor is, in contrast with the prev-
ious anlaysis, somewhat determined by intelligence and performance
intelligence in particular. This factor accounts for 5.4% of the com-
mon variance. The most important determinant of this factor is the
RPRS variable C, followed in order by the WAIS variable PC which is
straddled between factors 2 and 4, A which is straddled between factor
1 and 4, the RPRS variable FL which straddles factors 3 and 4, BD, PA,
the RPRS variables M and FM. It might be noted that small m is con-
spiciously absent on this last factor. This is in contrast to the
previous analyses and to the principal component analysis of the 6
RPRS and 11 WAIS variables. In the principal component factor analysis
small m has a loading of .84, followed by Sh .54 and FM .32, and is
clearly a non-intelligence factor. FM, C, FL and M all load solidly
on the third factor in principal component factor analysis (.79, .67,

.66, .64, respectively), while Sh straddles factor 2 and 3 (F_1 .33, F_2 .41). In the principal component factor analysis the commonality of small m was .75 and in principal factor analysis .11. This indicates that the variance in small m is largely specific variance, which was extracted as common variance in the principal component factor analysis. C, FL and Sh also had lower communalities in principal factor analysis when compared with the principal component factor analysis, although the difference is not as dramatic as for small m (C .71 and .40, FL .58 and .31, Sh .60 and .38).

The tentative conclusions from the principal factor analysis of the 6 RPRS and 11 WAIS variables are:

1. Small m does not reveal itself as the main determinant of an independent factor but appears to have a large amount of specific variance, which is non-intellectual.

2. The first factor is a verbal intelligence factor. The WAIS variable I is the most important determinant of this factor.

3. The 3 RPRS variables, which to some small degree contribute to this verbal intelligence factor, are small m, Sh and M.

4. The second factor is a performance intelligence factor. D sym and OA seem to be the most important determinants of this factor, followed by BD.

5. The RPRS variables which to some small degree contribute to this performance intelligence factor are Sh and M.

6. The third factor is a RPRS factor. The main determinant of this factor is FM, followed by M and Sh, Comp, FL and C in that order.

7. Comp is the most important WAIS variable contributing to the RPRS factor.

8. The fourth factor has the RPRS variable C as the most important contributor, followed by PC, A, FL, BD, PA, M and FM.

9. The most important WAIS variables on the fourth factor are PC (straddled between 2 and 4) and A (straddled between 1 and 4).

In interpreting the results of these factor analyses it has been taken into account that the range of the RPRS variables is considerably lower than the range of the WAIS variables. Because the range of the RPRS variables is smaller, lower correlations can be expected for these variables. Consequently, the distribution of the RPRS variables over the 4 factors has been emphasized. Summarizing the 2 exploratory factor analyses we find:

1. Small m is non-intellectual and separates itself from the other 5 RPRS variables. Small m is generally regarded as an indicator of subjective discomfort.

2. M, FL and Sh seem to possess some verbal intellectual dimensions compatible with the verbal dimension measured by I. The ability to draw upon and verbalize past experiences seems to best describe this dimension.

3. M and Sh also seem to possess some performance intellectual dimension compatible with the performance intelligence measured by OA, BD and D sym. Ability to concentrate and to integrate seems to best describe this dimension.

4. The most important determinant of the RPRS factor is FM, followed by M, Sh, FL, C, while Comp is the most important WAIS variable contributing to this factor. This factor seems to be best described by the ability to control impulses.

5. Another dimension of the RPRS is found only in the PF analysis of the 6 RPRS and 11 WAIS variables and is the most tentative one. C is the most important determinant of this factor, followed by PC, A, FL, BD, PA, M and FM. The ability to be aware of and the ability to respond to demands of the environment seems to best describe this factor.

CHAPTER VIII

SUMMARY AND RECOMMENDATIONS FOR FUTURE RESEARCH

Summary

In this study bivariate and multivariate (factor analysis) cor-relational analyses of the 6 RPRS scales and the WAIS were performed on a sample of 52 subjects with a wide range of variance in their performance.

Major conclusions of the study are:

1. The RPRS and WAIS measures are strongly, positively related with approximately 43% of the variance in the RPRS total accounted for by the variance in the WAIS total intelli-gence score.

2. Verbal intelligence is slightly higher related to the RPRS than performance intelligence ($p < .10$). Approximately 43% of the variance in the RPRS total can be accounted for by the variance in the verbal intelligence score of the WAIS, and approximately 27% of the variance in the RPRS total can be accounted for by the variance in the performance intel-ligence score of the WAIS.

3. A non-significant, higher portion (approximately 36%) of the variance in the RPRS total can be accounted for by the var-iance in the vocabulary, information and similarities sub-scales than can be accounted for by the variance in the object assembly and block design subscales together (approx-imately 26%).

4. Factor analysis of the RPRS results in 2 factors, the first factor is an intelligence factor accounting for approximately 85% of the common variance. FL, FM and M are the determinants of this factor. The second factor is a non-intelligence factor accounting for approximately 15% of the common variance. Small m is the main determinant of this factor. Sh is the only other variable possessing this non-intellective dimension. This second factor can be best described as an indication of subjec-tive discomfort. C is not clearly intellective or non-intellec-tive.

5. Exploratory factor analysis indicated the following:

   a. M ranks with Sh as the most factorially complex
      of the RPRS subscales. M is an intellective
      variable with both verbal and performance intel-
      ligence dimensions. It is only surpassed by FL
      as the strongest intellective variable.

   b. FM follows M as the 3rd most important intellec-
      tive variable. The intellectual dimension in FM
      is the one most germane to the RPRS subscales.
      It has no discernible amount of verbal or perfor-
      mance intelligence.

   c. Small m is the only RPRS variable which does not
      possess an intellective dimension.

   d. Sh is an intellective as well as a non-intellective
      subscale. It possesses a verbal as well as a per-
      formance intelligence dimension.

   e. C is, after small m, the least important intellec-
      tive variable, possibly possessing some degree of
      verbal intelligence.

   f. FL is the most important intellective subscale.
      The intellective dimension tends to be more of a
      verbal intelligence dimension.

Directions for future research

The RPRS variables which contribute most to the verbal intel-

ligence factor are M and FL followed by Sh and perhaps C. The RPRS

variables which contribute most to the performance intelligence

factor are M and Sh. This seems to be indicative that, when intel-

ligence is known, FM and small m become the most important RPRS varia-

bles. It has been demonstrated that intelligence is an important

determinant of the RPRS score with only small m as a newly pure non-

intellective variable. However, the intellectual dimension of FM is

not easily pinpointed by verbal or performance intelligence. FM is

described as an index of the handling of stress tolerance and the degree of comfort or discomfort a person feels with regard to drive impulses. The WAIS Comp subscale seems to cover the FM aspect with, regard to compulsive behavior. The basic assumption of the Comp subtest is the ability to analyze and justify the reasons for certain customs and the ability to act in conformity, which are considered to be important elements of intelligent behavior in our society. The WAIS variables which are the best measures of stress tolerance are A, DS, D sym, the anxiety triad. Low scores on all these subscales suggest trait anxiety. These subscales have low loadings on the RPRS factor to which FM is the main contributor. High scores on FM are not significantly correlated with high or low scores on A, DS, D sym. One might hypothesize that a certain amount of anxiety enhances the effectiveness of psychotherapy, but that too much anxiety immobilizes the person. Thus, anxiety would have a curvilinear relationship to success in therapy. Factor analysis, because it is based on correlation, assumes a linear relationship. Therefore, no conclusions about the relationship between FM and A, DS, D sym can be made in this study. It might also be pointed out that previous research correlating the RPRS subscores with success in therapy (see Table I) has failed to find positive correlations between FM and success in therapy. Therefore, further research examining the curvilinear relationship between FM and success in therapy seems to be indicated.

The Information subscale seems to be the best measure of the verbal intelligence dimension present in the RPRS. Whether D sym can

be used as a measure of the performance intelligence present in the RPRS needs to be explored in future research. It was mentioned before that for the sample used in this study the intercorrelations of D sym with the other WAIS subscales are considerably lower than the inter-correlations given in the WAIS manual. Hybl and Stagner (1952) found that the D sym subtest from the Wechsler-Bellevue was a good prediction of client improvement. Whether I, D sym, Comp and possibly A, DS, D sym can be used as predictors of success in therapy warrants further research. Finally, the reasons for the ambiguity of the status of C in this study should be explored and pursued. That color responses in general are not easy to interpret has been pointed out by Frank in his 1976 review of the literature linking color responses to affect. Frank states that there are too many confounding aspects in the use of color (hue, location, saturation, individual color preference) to generalize the meaning of color responses.

This study has shown that a relationship exists between intelligence and the RPRS. The results also point to future research using certain WAIS subscales as possible predictors for success in therapy.

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