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A TEST-RETEST RELIABILITY STUDY OF THE

PICTURE-PREFERENCE TEST SCALES

by

Anita Benoit Fuerth

Hons. B.A., University of Western Ontario, 1974

A Thesis
Submitted to the Faculty of Graduate Studies
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ABSTRACT

Although the Picture-Preference Test (P-PT), a new personality measurement method devised by Cowan (1967), showed promise in terms of evidence for its construct validity and for its concurrent validity, its scales had poor internal consistency. The present study was designed to study the stability of the P-PT over time and to elucidate the nature of the test. Two successive administrations of 199 items of the P-PT were given, with a three-week interval between testings, and a Pearson product-moment correlation and an internal consistency measurement were computed for 16 scales of the P-PT. The mean test-retest reliability and K-R 20 were .65 and .30 respectively, indicating that the P-PT scales were measuring fairly stable but heterogeneous traits. It was suggested that although the concept defining a trait may well comprise several dimensions and therefore be heterogeneous, which would mean that we could not expect high indices of internal consistency, somewhat higher homogeneity among the individual scale items is necessary in order to make unambiguous interpretations concerning the traits.

ACKNOWLEDGEMENTS

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CHAPTER I

INTRODUCTION

In an attempt to evaluate the addictive personality, Cowan (1967) developed a new procedure for personality measurement, the Picture-Preference Test (P-PT). This test combined the ability of projective techniques to obtain responses without the influence of defensive tendencies and the ease of an objective scoring system. The P-PT items were in the form of pictures that were to measure traits theoretically considered to characterize addicts. Cowan constructed 106 pairs of pictures such that the preference for one picture in a pair was viewed as an addictive choice and the other was viewed as non-addictive. For example, in one item a choice was to be made between a car proceeding on a bumpy road and the same car taking a smooth but round-about detour. It was predicted that addicts would choose the former because of their low frustration tolerance. From these items, 10 subscales were formed and the test was administered to a sample of addicts, neurotics and normals (N = 276). Each pair of pictures was presented side by side on one slide. Subjects were required to select the picture they liked better, either the picture marked A (on the left), or the picture marked B (on the right) and to record their preferences. It was found that the total score on the P-PT could validly discriminate addicts from normal subjects. However, the neurotics were not distinguishable from the addicts.

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Studies of Reliability of Picture-Preference Scales

Begin, Auld and Morf (1974) saw the potential in Cowan's approach but noted that the internal consistency of the various scales, as computed by Kuder-Richardson Formula 20, was low (see Table 1). Their study aimed at improving the reliability of the five most promising scales in the P-PT and at cross-validating the revised scales of the test on a new sample of 109 normals and 106 alcoholics. Items which had a low point-biserial correlation with the total score on their original scale were deleted or were shifted to a scale with which they had a significant correlation. This resulted in four revised scales which did not exhibit significantly higher reliabilities than the original scales but which were shorter and hence more efficient in their discrimination between alcoholics and normals.

Morrison (1973) devised 91 additional items in an attempt to improve the reliability of the P-PT. He used four scales from the original ten and added three new scales to the test. This revised test was administered to 50 alcoholic, 35 neurotic and 50 normal males. Some improvement in the internal consistency of the scales was found. The Kuder-Richardson reliability estimates of the trait-scales for each group is shown in Table 2.

Subsequently attempts have been made to improve individual scales. Amin (1974) undertook to develop a scale measuring avoidance of sexual intimacy. He selected some items from Cowan's original test and added his own. The revised scale was administered to a sample of 109 women

Table 1

Scales Included in Cowan's Picture-Preference Test and

Scale Reliabilities Based on Original Sample ($\underline{N}$ = 276)

Scale	Number of Items	K-R 20
1. Compulsiveness	8	.09
2. Impulsiveness	8	.26
3. Avoidance of Intimacy	12	.40
4. Oral-incorporative trends	16	.18
5. Infantile need for security	23	.12
6. Damaged self-esteem	10	.32
7. Reliance on external objects	9	.11
8. Low frustration-tolerance	5	.02
9. Narcissism	11	.04
10. Antisocial tendencies	4	.40

Table 2

Kuder-Richardson Reliability Estimates

of Trait-Scales for Each Group

Scale	Alcoholics (N = 50)	Neurotics (N = 35)	Normals (N = 50)
Impulsiveness	0.15	−0.15	0.11
Oral Dependency	−0.05	0.12	−0.08
Magical Omnipotence	0.25	0.23	0.06
Antisocial Impulses	0.79*	0.65*	0.43*
Avoidance of Intimacy	0.29*	0.28*	0.36*
Infantile Need for Security	0.34*	−0.23	−0.39*
Masochistic Tendencies	0.58*	−0.16	−0.01

*$p < .05$.

but it was found that the objective of good internal consistency was
not realized; the Kuder-Richardson reliability in his sample was .42.
However, in an educational psychology class (N = 37), K-R 20 was .63;
and in a sample (N = 271) obtained by Begin in connection with his
doctoral research (1975), K-R 20 for Amin's scale was .70.

In 1975, Begin designed an oral-dependency trait-scale for the
P-PT comprising 40 items. He sought to make the new scale more in-
ternally consistent than previous "oral dependency" scales had been.
He included items which would distinguish between two phases of oral
development; an early, sucking ("dependent") phase and a later, biting
("sadistic") phase. On his total sample of 271 subjects, the Kuder-
Richardson reliability of the 40-item scale was .35. Attempting to
improve internal consistency, Begin selected the 19 items that cor-
related best with the total score on the scale. In the original
sample, K-R 20 increased to .50.

Berek (1975) felt that Cowan's original test and Morrison's re-
vision of it needed clarification, and he designed a study to discover
the factors in the P-PT and to assess their reliability. After being
administered to a sample of 309 undergraduates, the 196 items from
Cowan's and Morrison's versions of the P-PT were divided into two
sets, A and B, according to a stratified randomization. Each set of
items was subsequently factor analyzed and 3 meaningful factors were
derived from each set. These factors were named General Social
Dysfunction Preference (Factor 1), General Anti-Social Activity

Preference (Factor II) and General Passive Orientation Preference
(Factor III). It was found that these factors were correlated across
sets (Factor I, r = .96; Factor 2, r = .54; Factor 3, r = .50).
This gave evidence for the test's factor reliability. By factor
analyzing Berek's raw data, Auld (1976) shortened the three factor
scales and designated them as Maladjustment (Factor I), Masculine
Aggressiveness (Factor II) and Alienation (Factor III).

Studies of Validity of Picture-Preference Scales

Group comparisons and comparisons of the P-PT scores with scores
on other tests provide some evidence for the concurrent validity of
the P-PT. Several studies have shown that the P-PT discriminates
alcoholic from normal subjects. However, the results obtained from
samples of neurotic subjects were confusing because the results dif-
fered from one study to another. Also, Begin (1975) reported that his
oral-dependency scale did not distinguish alcoholics from normals. At
best, it can be said that there is inconsistent and ambiguous evidence
showing some differences between alcoholics and normals on the P-PT.
These results, however, are hampered by uncontrolled variation in
subjects in the groups.

The comparisons of the P-PT scores with scores on other tests
sometimes yielded more favorable evidence. Amin (1974) found that the
revised Avoidance of Sexual Intimacy Scale correlated fairly well
(r = .64) with TAT scores which were used as a criterion. Begin
(1975) found that, in his sample from a home economics class (N = 66),

there was a negligible correlation ($\underline{r}$ = .05) between his oral-dependency scale and Wolowitz's Food-Preference Inventory. Most recently, in work conducted by Ryan (1976) P-PT scales were found to have significant correlations with Differential Personality Inventory scales (DPI). Table 3 presents some of these correlations.

Finally, Berek's (1975) factor study, in which three interpretable factors were obtained, gave some evidence for the validity of the items. This is especially noteworthy in that these factors were found in each of the set of items created by a split-half method.

Need for Further Evidence of Reliability of P-PT

Although numerous estimates of the internal consistency of the P-PT scales have been made, we still lack solid evidence for internal consistency, except in the case of Berek's Factor Scale I. To some extent, the lack of internal consistency is at variance with the demonstrated ability of the scales to discriminate. For instance, Amin's Avoidance of Sexual Intimacy scale had a K-R 20 reliability of .42, but it predicted the TAT scores with $\underline{r}$ = .64. Similarly, some of the other scales may be more reliable, in some sense, than the Kuder-Richardson reliabilities seem to indicate. It would, therefore, seem useful to make some other approach to studying reliability besides estimating internal consistency.

As Anastasi (1968) states: "It is a fundamental assumption of all projective techniques that the individual's responses to the ambiguous stimuli presented to him reflect significant and relatively

Table 3

Significant Correlations Of P-PT Scales

With DPI Scales (N = 192)

P-PT Scale	DPI Scale	Correlation
Maladjustment	Cynicism	.30
	Impulsivity	.22
	Rebelliousness	.23
	Socially Deviant Attitudes	.20
Alienation	Irritability	−.20
Morrison – Anti-Social Impulses	Cynicism	.29
	Impulsivity	.30
	Socially Deviant Attitudes	.24
Cowan – Anti-Social Tendencies	Cynicism	.19
	Impulsivity	.28
	Rebelliousness	.17
Cowan – Reliance on External Objects	Infrequency	.19
	Health Concern	−.19
	Hostility	−.21
Cowan – Infantile Need For Security	Family Discord	.17
	Hostility	−.25
	Irritability	−.24
	Rebelliousness	−.19
Cowan – Compulsiveness	Defensiveness	.17
Cowan – Impulsiveness	Rebelliousness	−.18
Cowan – Avoidance of Intimacy	Infrequency	.17
	Irritability	.21
Amin – Avoidance of Sexual Intimacy	Irritability	.17
	Family Discord	.22

enduring personality attributes (p. 516)." The stability of traits
is an important issue in test development since a current trend in
psychology has been to account for human behavior mainly in terms of
the situation and to minimize the role of traits or intrapsychic
determinants. Mischel (1969) has argued that mental traits are super-
fluous as explanations of behavior and that behavior is situation
specific. He states: "When the eliciting and evoking conditions that
maintain behavior change - as they generally do across settings - then
behavior will surely change also (1969, p. 1016)." However, enduring
characterological and stylistic differences do appear to exist. The
view that this consistency is a result of unchanging social environ-
ments has caused Wachtel (1973) to wonder:

> why for some people the situation is so rarely dif-
> ferent. How do we understand the man who is con-
> stantly in the presence of overbearing women, or
> constantly immersed in his work, or constantly with
> weaker men who are cowed by him and offer little
> honest feedback? (p. 331)

Within the context of this situation versus trait controversy, it is
clear that the development of the P-PT is more amenable to a trait
approach and that a good measure of a trait must exhibit stability
over time.

The purpose of this study was to examine the stability of various
P-PT scales over time. It was hoped that this would throw light on
the question of why some trait-scales discriminated better than their
poor internal consistency would have led one to expect. The relia-
bility of the test over time would also bear on the question of whether
stable personality dispositions were being measured by the scales.

CHAPTER II

METHOD

Subjects

The $\underline{S}$s in this experiment were 125 undergraduate students; 90 females and 35 males, who were attending Intersession and Summer Session psychology classes at the University of Windsor. $\underline{S}$s who completed the experiment received credit for participation. The data from 20 $\underline{S}$s were not included in the data analysis because their response-sheets were improperly or incompletely filled out, or because they did not appear for the second testing session. Thus, the final sample was composed of 105 undergraduates, 75 females and 30 males. Data about the subject's age was requested and obtained from 75 of these subjects. (It was not asked for in the other group of participants.) Ages of these 75 subjects ranged from 18 to 46 years, with a mean of 27.3 years ($\underline{SD} = 7.68$).

Design

The design of the study involved giving the Picture-Preference Test twice, with a three-week interval between testings and without any intervening practice or instruction. A reliability estimate based on two successive administrations of the same test was considered appropriate in this case. It was felt that the two assumptions set out by Kelly (1967) were met: "(1) that persons do not change their

relative true positions on the trait continuum from the first to the second testing, and (2) that a person's experience in taking the test does not result in the test becoming, for him, on the second admin-istration a different test (pp. 36-37)." Memory was considered un-likely to be a factor, given the large number of items (199) and the interval of three weeks between testings.

Procedure

The test consisted of 199 picture-pairs which were presented by means of a slide-projector. The pictures were placed side by side, the Ss viewing the members of each pair simultaneously. Each picture-pair was shown for a 10-second interval, during which the Ss recorded their preference for either the picture on the left ("A"), or the picture on the right ("B"). Complete instructions are presented in Appendix A. Since the order of the picture-pairs was randomized, items belonging to any single scale were scattered through the test.

In order to provide a means by which to match the first and second test records of each S and still assure anonymity, each S was asked to place a code number on his/her answer sheets during the in-itial testing and to use the same number when being tested three weeks later.

P-PT Scales

The 199 items included all 106 of Cowan's original test items, 45 items from Amin's Avoidance of Sexual Intimacy Scale, and Begin's

40 items in the Oral-Dependency scale, as well as some of Morrison's items. The main focus was on the following scales: Maladjustment, Masculine Aggressiveness, Alienation, Avoidance of Sexual Intimacy, and the Oral-Dependency scales. These five scales were chosen for specific reasons. The items that belong together from Cowan's original 106 items were likely to be included in the three factor scales that were obtained by Berek (1975) and subsequently shortened by Auld (1976). It was, therefore, likely that if any internally consistent scales could be developed from the 106 items, such scales would be similar to the Maladjustment, Masculine Aggressiveness, and Alienation factor scales. The Avoidance of Sexual Intimacy scale was included because of the strong evidence of its validity, and the Oral-Dependency scale was included because it has a solid rationale for the inclusion of items. The rationale ties it to Freudian theory of psychosexual development. A description of the 199 items is contained in Appendix B.

CHAPTER III

RESULTS

A Pearson product-moment correlation and an internal consistency measure (K-R 20) were computed for each of the 16 scales of the Picture-Preference Test. The results are presented in Table 4. All 16 scales had significant test-retest reliability coefficients ($p < .01$); 8 P-PT scales had K-R 20 coefficients significant at $p < .01$ and 3 additional K-R 20s were significant at the .05 probability level. The retest reliabilities ranged from .39 for Cowan's Low Frustration Tolerance scale to .79 for Amin's Avoidance of Sexual Intimacy scale. The K-R 20s ranged from .23 for Cowan's Antisocial Tendencies scale to .77 for Morrison's Antisocial Impulses scale. The median test-retest reliability was .60 and the median K-R 20 was .26. The mean test-retest reliability and K-R 20 were .65 and .30 respectively.

Test-retest reliability figures were also computed for males and females separately. These data are contained in Table 5. Fisher's z_r transformation was used to test whether the difference between male and female correlation coefficients was statistically significant. Only the difference on the Morrison Antisocial scale (r for females was .61, for males was .88) was significant, z (101) = 2.90, $p < .01$.

In order to see whether the scores differed between the first and second testing, the author computed means and standard deviations for the two testings. Table 6 presents these means and standard deviations. A difference between the two testings was found for the Maladjustment

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Table 4

Reliability of the Picture-Preference Test Scales

	Scale	Number of Items	Test-Retest Reliability[1]	K-R 20
1.	Maladjustment	16	.51	.58**
2.	Masculine Aggressiveness	7	.72	.45**
3.	Alienation	6	.60	.00
4.	Oral Dependency - Begin	40	.66	.35**
5.	Avoidance of Sexual Intimacy - Amin	45	.79	.54**
6.	Antisocial Impulses	23	.75	.77**
7.	Compulsiveness	8	.54	.41**
8.	Impulsiveness	8	.42	.11
9.	Avoidance of Intimacy	11	.72	.39**
10.	Oral-incorporative trends	16	.62	.27**
11.	Infantile need for security	23	.61	.22*
12.	Damaged self-esteem	10	.58	.15
13.	Reliance on external objects	9	.55	.25*
14.	Low frustration-tolerance	5	.39	.00
15.	Narcissism	10	.54	.07
16.	Antisocial tendencies	4	.70	.23*

[1]All correlations are significant at $p < .01$.

*$p < .05$.

**$p < .01$.

Table 4 Continued

<u>Note:</u> The significance of the K-R 20s is based on the following.
formula:

$$\underline{F} = \frac{1 - r_\alpha}{1 - \rho_\alpha}$$

with $\underline{df}$ = $(n - 1)(J - 1)$ and $(n - 1)$

n = subjects

J = scorable units (number of scale items)

(Hakstian & Whalen, 1976, p. 220).

Table 5

Test-Retest Reliabilities Of P-PT

Scales For Males & Females

| | Test-Retest Reliabilities | |
Scales	Males	Females
Maladjustment	.61	.49
Masculine Aggressiveness	.60	.76
Alienation	.67	.57
Oral Dependency	.69	.68
Avoidance of Sexual Intimacy	.75	.80
Antisocial Impulses - Morrison	.88*	.61
Compulsiveness	.62	.39
Impulsiveness	.40	.46
Avoidance of Intimacy	.76	.71
Oral-incorporative trends	.69	.56
Security	.75	.47
Damaged self-esteem	.48	.63
Reliance on external objects	.45	.58
Low frustration-tolerance	.21	.39
Narcissism	.44	.50
Antisocial tendencies	.82	.63

*Indicated correlation is significantly higher ($p < .01$)

than corresponding correlation for the opposite sex.

Table 6

Means and Standard Deviations of

Picture-Preference Test Scales

($\underline{N}$ = 105)

Scale	First Testing		Second Testing	
	$\underline{X}$	$\underline{S.D.}$	$\underline{X}$	$\underline{S.D.}$
1. Maladjustment	1.60*	1.76	1.18	1.69
2. Masculine Aggressiveness	2.60	1.59	2.43	1.48
3. Alienation	3.06	1.08	3.11	1.27
4. Oral Dependency	21.91	3.64	22.12	4.31
5. Avoidance of Sexual Intimacy	16.47	4.31	16.20	5.97
6. Antisocial Impulses	3.21	3.15	2.98	3.79
7. Compulsiveness	3.04	1.66	3.01	1.42
8. Impulsiveness	2.52	1.22	2.40	1.25
9. Avoidance of Intimacy	2.74	1.64	2.64	1.74
10. Oral-incorporative trends	5.00	1.92	4.99	1.78
11. Infantile need for security	8.22	2.34	7.88	2.52
12. Damaged self-esteem	2.85	1.24	2.74	1.10
13. Reliance on external objects	2.71	1.41	2.75	1.21
14. Low frustration-tolerance	2.21	0.87	2.16	0.94
15. Narcissism	3.77	1.51	3.64	1.45
16. Antisocial tendencies	0.82	0.86	0.82	0.96

*Indicated mean is significantly higher ($\underline{p}$ < .01) than corresponding mean for second testing.

scale, t (103) = 2.52, p < .01.

Means and standard deviations were computed for males and females separately for each scale. Table 7 shows the results for those scales in which a statistically significant difference between the sexes on the first testing was found. In testing whether males and females differed, the author first compared the variance of males and females on each scale. In this series of F tests, no significant difference was found. Then the author tested for differences between means on the first testing, finding 8 scales with differences significant at the .05 level or higher. However, it should be noted that the difference between sexes on the Compulsiveness and Impulsiveness scales was not significant on the second testing.

Because of the question of the influence of age and sex upon response, a Pearson product-moment correlation for each scale with these variables was computed. The results are reported in Table 8.

Table 7

Comparison of Means of Males and Females on

8 P-PT Scales (Standard Deviations in Parentheses)

Scales	Males	Females	$\underline{t}$
Narcissism	2.70 (1.29)	4.20 (1.39)	6.00**
Security	7.07 (2.65)	8.68 (2.04)	5.05**
Antisocial Impulses	4.53 (3.98)	2.68 (2.60)	4.99**
Avoidance of Sexual Intimacy	15.20 (4.06)	16.97 (4.33)	4.09**
Oral-Incorporative Trends	5.70 (2.10)	4.72 (1.78)	3.34**
Compulsiveness	2.47 (1.76)	3.27 (1.58)	2.92**
Impulsiveness	2.97 (1.19)	2.35 (1.19)	2.65**
Low Frustration Tolerance	1.90 (0.80)	2.33 (0.88)	2.11*

*$\underline{p}$ < .05.

**$\underline{p}$ < .01.

Note. Only scales having significant difference in means between males and females are listed.

Table 8

Correlation of Scales With Age and Sex

Scale	Correlation with Age ($\underline{N}$ = 75)	Correlation with Sex[1] ($\underline{N}$ = 105)
1. Maladjustment	+.10	−.07
2. Masculine Aggressiveness	−.19	−.09
3. Alienation	+.21*	−.16*
4. Oral Dependency	−.08	+.05
5. Avoidance of Sexual Intimacy	+.04	+.21*
6. Antisocial Impulses − Morrison	+.02	−.27**
7. Compulsiveness	+.05	+.19*
8. Impulsiveness	−.07	−.23**
9. Avoidance of Intimacy	−.23*	−.09
10. Oral-incorporative trends	+.04	−.23**
11. Infantile need for security	+.17	+.27**
12. Damaged self-esteem	−.09	+.02
13. Reliance on external objects	+.16	−.12
14. Low frustration-tolerance	+.01	+.23**
15. Narcissism	−.08	+.45***
16. Antisocial tendencies	−.03	−.15

*$\underline{p}$ < .05.
**$\underline{p}$ < .01.
***$\underline{p}$ < .001.

[1]Note. Since males are coded 1, and females are coded 2, then a negative correlation means males are higher on the variable and a positive correlation means females are higher on the variable.

CHAPTER IV

DISCUSSION

Overall, the results indicate higher test-retest reliabilities
for the P-PT scales than internal consistency. The only cases in
which this did not occur are the Maladjustment and Antisocial Impulses
scales. Since the Antisocial Impulses scale had a substantial K-R 20
(.77), this finding is not unexpected. However, the relatively low
test-retest reliability of the Maladjustment scale is perplexing since
this scale was the principal factor obtained through factor analysis.
All other scales were more reliable than their internal consistency
would have led one to expect.

Test-Retest Reliability

The retest reliability indicates the extent to which day-to-day
fluctuations affect the test score. The effect of variations in
testing conditions, such as noise, weather and other distractions,
and changes within the individual, such as illness, fatigue, emotional
stress, etc. are viewed as error variance. The higher the retest
reliability, the more generalizable over different occasions and the
less susceptible to random daily changes, the test scores will be.

Researchers in the personality realm have varied in their eval-
uation of what constitutes an adequate test-retest reliability co-
efficient. Kelly (1967) stated: "Reliability coefficients of .95

and over are almost non-existent; those between .90 and .95 are
rare; many of the best and more widely used tests have reliability
coefficients between .70 and .90, (p. 42)." The most rigorous
standards establish r = .80 as a goal. Jackson's Personality Research
Form scales range from .69 to .90 for test-retest reliability and
Eysenck's Personality Inventory have test-retest reliabilities of .80
to .97 (Buros, 1972). Using the highest standard, none of the P-PT
scales would be considered adequate. However, an evaluation should
be made in light of the state of development of the test. It is sug-
gested that a reasonable standard for practical purposes at this point
would be an r of .70. Using this criterion, five P-PT scales attained
adequate retest reliabilities: Amin's Avoidance of Sexual Intimacy,
Morrison's Antisocial Impulses, Masculine Aggressiveness, Cowan's
Avoidance of Intimacy and Cowan's Antisocial Tendencies.

Another point to be considered is the nature of the group on
which the reliability was measured. The range of individual differ-
ences will affect the correlation coefficient. Dick & Hagerty (1971)
have pointed out that "with respect to the magnitude of the reliability
coefficient, the user should be aware that a coefficient of .70 with a
rather narrow range of talent in the testing group is fully as good
as a coefficient of .90 based on a group with a much greater range of
talent (p. 68)." The present sample was a highly homogeneous group,
a university population. With respect to the traits being measured,
the variation was small; the standard deviations ranged from 0.86 on

the 4-item Antisocial Tendencies scale to 5.97 on the 45-item Avoidance
of Sexual Intimacy scale. It is then reasonable to expect a higher
reliability coefficient when the standard deviation of the group is
increased.

Internal Consistency

A necessary condition for obtaining a high consistency index is
a substantial factor common to all items. Each item is expected to
measure the same factor or the same weighted combination of factors
as every other. This does not appear to be the case for the items of
the P-PT scales. The only notable K-R 20 was that of Morrison's
Antisocial Impulses scale (r = .77). It was expected that the factor
scales would have superior consistency. In relation to the other
scales, this was true for Factor Scales I and II. Since the Masculine
Aggressiveness scale contained only seven items, the author felt it
would be of value to investigate the effect that lengthening the scale
to 20 items would have on its internal consistency. This was estimated
by means of the Spearman-Brown formula. Interestingly, it was found
that the internal consistency of the scale would increase from .45 to
.71. Although the result was less impressive for the Maladjustment
scale, its K-R 20 increased from .58 to .63. The remaining K-R 20s
were poor.

Relationship of Validity to Reliability

The relevance of the validity of a test to its reliability becomes

apparent when one considers whether the criterion the test is trying

to predict is itself relatively homogeneous or heterogeneous.

Anastasi (1968) states: "Although homogeneous tests are to be pre-

ferred because their scores permit fairly unambiguous interpretation,

a single homogeneous test is obviously not an adequate predictor of

a highly heterogeneous criterion. Moreover, in the prediction of a

heterogeneous criterion, the heterogeneity of test items would not

necessarily represent error variance (pp. 84–85)." Often many hetero-

geneous items need to be retained to have a valid measure of the trait,

but at the same time, the internal consistency of the test is reduced,

resulting in a trade-off situation. A trait can best be understood

not as a homogeneous, single factor, but rather as containing a set

of components that would enable one to make predictions for a variety

of situations, as one would with a multiple regression equation. A

common factor plus group factors are involved and are necessary to

predict the external criterion. This theoretical view would explain

how Amin's Avoidance of Sexual Intimacy scale, which has a K-R 20 of

.40, could predict TAT scores with r = .64. A complex combination of

factors are all relevant in defining a meaningful trait. Thus, the

low internal consistency may not indicate a deficit in one's strategy

of item-selection, but rather may reflect the heterogeneity of that

domain of behaviour. It may be proposed that this is evidence that

behaviour is situation specific, as Mischel suggests. However, the

magnitude of the test-retest reliabilities in this study argues

against this interpretation.

Good reliability may also be achieved by saturating scales with socially desirable items as Edwards (1957) has shown. It is important to note that several researchers (Amin, 1974; Berek, 1975; Ryan, 1976) have found that social desirability is not a major determinant in the composition of the P-PT scales.

Sex Differences

The highest correlation with sex was found on the Narcissism scale (r = .45). An interpretation in this case is difficult because of the scale's low internal consistency. The scale was originally designed by Cowan as a composite of a number of different personality traits. The items that showed the greatest power in differentiating males and females were: the choice by females of a movie magazine over a news magazine; a woman on a bed being examined by a female doctor over the same scene with a male doctor; and the two men wrestling over two men boxing. No speculation as to meaning is offered.

The only scale that can justifiably be interpreted in terms of sex differences is the Antisocial Impulses scale, which has a K-R 20 of .77 and a test-retest reliability of .88 for males. The correlation with sex was -.27, meaning that males scored higher on this variable than females. The items that discriminated between males and females most successfully appear to have an aggressiveness component: male choices of a rifle over a hat; a dagger instead of a pair of scissors; a criminal figure over a horse; and the sign for

"The Godfather" over the sign for "Love Story". This is supported by previous research by Auld, Ratner and Begin (1976), which found a significant correlation between the Antisocial Tendencies scale and the Male Aggressiveness scale for a group of normal males. This may then account for the obtained sex difference. The literature provides strong evidence for the view that males are the more aggressive sex. Maccoby and Jacklin (1974) state: "The sex difference in aggression has been observed in all cultures in which the relevant behavior has been observed. Boys are more aggressive both physically and verbally...Although the aggression of both sexes declines with age, boys and men remain more aggressive through the college years (p. 352)."

Age Factor

No meaningful interpretations could be made for the two significant correlations with age. Again, the internal consistencies of these scales were very poor.

CHAPTER V

CONCLUSIONS

In summary, it appears that some relatively stable traits are being measured by the majority of the P-PT scales used in this study. However, it is apparent that these traits are not homogeneous, which poses a problem in terms of clear interpretations. The scales which hold the most promise are: Amin's Avoidance of Sexual Intimacy, Morrison's Antisocial Impulses, Masculine Aggressiveness, Cowan's Avoidance of Intimacy, and Cowan's Antisocial Tendencies. At present, the test-retest reliability coefficients for these scales are satisfactory for the purposes of determining whether the mean scores of several groups of people are significantly different. However, an unambiguous interpretation of the character of the differences based on these scales would not be possible. It is also apparent that if the ultimate purpose of the test is to compare one examinee with another, somewhat higher K-R 20 reliabilities are necessary, even if one takes into account the heterogeneity of the traits.

APPENDICES

APPENDIX A

INSTRUCTIONS FOR PICTURE-PREFERENCE TEST RESEARCH

INSTRUCTIONS FOR PICTURE-PREFERENCE TEST RESEARCH

We are studying a new approach to personality measurement, a picture-preference test, and are comparing it with the more conventional questionnaire approach. You will be asked to make choices between pictures projected on the screen.

At the top right, above the box marked "student number", we would like you to put a number by which we can tell you are the same person when you take another test in a couple of weeks. We suggest you use your Social Insurance Number because you will easily remember that you did use it when you take the test in a few weeks. If you are a United States citizen, use your Social Security Number, or if you have no Social Insurance Number, use your student identification number. Please also mark the second sheet at the top right with the same identification number you used on the first sheet. We are not interested in knowing who you are but only in matching up the two tests. We would also ask that you mark your age in the area left blank for the course and your sex in the area for the section. All of your choices and answers are confidential. Please do not put your name on the answer sheet.

Now for the instructions about the test. The answer sheets are standard computer multiple choice examination answer sheets. The first answer sheet is numbered from 1 to 140; the second sheet is numbered from 141 to 280. In taking this test, your task is simply to choose which of the two pictures you like better, filling in the "A" blank on

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the answer sheet if you like the left-hand picture better, or the "B" blank if you like the right-hand picture better. A sample item is now being projected on the screen. Please don't mark anything yet. Above the pictures is an "X", which replaces the number for the actual test pictures. So in this case, you would fill in "A" on the answer sheet opposite the "X" or the number of the item, if you preferred the left-hand picture of the lamp or "B" if you preferred the right-hand picture of the tree. Now here is another sample set of pictures for you to watch. You would fill in "A" on the answer sheet opposite the "Y" if you preferred the left-hand picture or the "B" if you preferred the right-hand picture. Each set of pictures will be shown for ten seconds. You should mark your choice within this time period. Sometimes you will find it hard to choose one or the other picture. Please make a choice for every pair of pictures, even if it is difficult to do so. If you don't like either picture, mark the one you dislike less.

In a minute the pictures will begin. Please mark your choices, starting with picture Number 1.

APPENDIX B

DESCRIPTION OF PICTURE-PREFERENCE TEST ITEMS AND

SCORING KEY

DESCRIPTION OF PICTURE PREFERENCE TEST ITEMS AND

SCORING KEY

Trait-Scales

1. Maladjustment (Berek and Auld).

2. Masculine Aggressiveness (Berek and Auld).

3. Alienation (Berek and Auld).

4. Oral Dependency (Begin).

5. Avoidance of Sexual Intimacy (Amin).

6. Antisocial Impulses (Morrison).

7. Compulsiveness (Cowan).

8. Impulsiveness (Cowan).

9. Avoidance of Intimacy (Cowan).

10. Oral-Incorporative Trends (Cowan).

11. Infantile Need for Security (Cowan).

12. Damaged Self-Esteem (Cowan).

13. Reliance on External Objects (Cowan).

14. Low Frustration Tolerance (Cowan).

15. Narcissism (Cowan).

16. Antisocial Tendencies (Cowan).

17. Oral Dependence (Morrison).

Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
X.	Lamp on table	Tree	
Y.	Triangle	Square	
1.	Banana	Cob of Corn	A(4)
2.	Marquee displaying LOVE STORY	Marquee displaying GODFATHER	B(6)
3.	Silhouette of a woman in a shower	Woman watering a plant	B(5)
4.	Drums	Harmonica	B(4)
5.	An owl on a tree branch	Salesman fitting a woman with shoes	A(5)
6.	Soft ice cream cone	Ice cream sandwich	A(4)
7.	A conservative appearing man	A masked man	B(6)
8.	A male sword-swallower	A male fire-eater	A(10)
9.	Car driving off with a just married sign	Man and woman being married by a minister	B(5)
10.	Rear view of a tenement and alley	A fun-house mirror with distorted reflection	A(12)
11.	Soft boiled egg	Hard boiled egg	A(4)
12.	A man and woman kissing	Scene inside a movie theatre	B(5,9)
13.	Father reprimanding son in a loving way	Son kicking family cat	B(2,6)
14.	A family picnic	Several couples on a haystack	A(5)
15.	A wheelchair	A pair of crutches	A(11)

Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
16.	A skinny man	A fat man	B(1,10)
17.	Jello	Pineapple slices	A(4)
18.	Refrigerator with door open - amply stocked	Refrigerator with door closed	A(10)
19.	Man opening a motel door for a woman	A woman typing	B(5)
20.	Christmas tree with presents	Santa Claus with bag of presents	B(11)
21.	A boy being treated by a doctor	Boy escaping through window from scene of crime	B(6)
22.	An upright baby bottle	Same bottle tilted down and out	B(10)
23.	Medicine cabinet filled with tooth-brushes, bandaids, etc.	Same, filled with pill bottles	B(10)
24.	A stack of cans on table in a heap	Man's hand adding a can to a tall tower of shaky cans	A(8)
25.	Spaghetti	Crusty rolls	A(4)
26.	A girl thinking about a grave	Same girl thinking about husband and child	A(1,12)
27.	Figure going down in a whirlpool, man diving in to save him	Same, but man throwing life preserver	A(8)
28.	Couple looking through a picture album	A couple dancing	A(5)
29.	Modern art represen-tation of a figure close up	Same - at a distance	B(5,9)

Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
30.	Figure giving shot to a man's arm	Same man receiving shot from an arm	B(11)
31.	Bedroom, two figures in bed	Bedroom, one figure in bed	B(1,5,9)
32.	Sliced peaches	Apple pie with cheese	A(4)
33.	A group of people standing and talking	Same, with one person away from the group	B(3,9)
34.	Man and woman on a motorcycle with a sidecar	Woman hanging onto a man on a motorcycle	A(5)
35.	Clarinet	Trumpet	A(4)
36.	A man hanging from a cliff, holding branch with one hand	Same man, crumpled on ground at foot of cliff	B(1,8)
37.	A man with mask and gun	A policeman	A(1,6,16)
38.	A soldier in fatigues peeling potatoes	Woman having a tooth drilled by a dentist	A(5)
39.	A rose with thorns	A dead tree	B(1,12)
40.	An escalator	An express elevator with door closed	A(8)
41.	A road going into distance with town in background	Same, with no town in sight	B(9)
42.	A double bed	Twin beds	B(1,5,9)
43.	Superman	A muscular stevedore	A(3,11)
44.	A car parked on side of road with hood up	Same car driving on a mountain road with cliff on side or road	A(1,14)

Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
45.	A woman holding a baby	Same woman playing with baby	A(11)
46.	Man drinking a coke	Man blowing a trumpet	A(4)
47.	People boarding a plane	Man and woman standing close, looking at papers	A(5)
48.	Sleeping Beauty and Prince Charming	Snow White and the Seven Dwarfs	B(3,5,9)
49.	Man driving a big, expensive car	Male graduate in cap and gown	A(11)
50.	A car going over a bumpy road	Road showing a detour sign pointing to another	A(2,8)
51.	Pizza	Cream pie	B(4)
52.	Statue of man and woman embracing	Statue of a nude woman carrying a jug	B(5)
53.	A woman in a bathing suit.	Same woman, cooking at a stove	B(5,10)
54.	Glass of milk	Banana	A(4)
55.	A very thin woman	A fat woman	B(1,10)
56.	Stethoscope	Package of dynamite	B(6)
57.	Child asleep in a crib	A man and woman sleeping together	A(5)
58.	Car being pulled by tow truck	Car being pushed by tow truck	A(11)
59.	Ice cream sundae	Apple pie with cheese	A(4)
60.	Man watching woman from a window	Women boarding a bus	B(5)

Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
61.	Jar of olives	Bunch of radishes	A(4)
62.	Picture of a mouth	Picture of two eyes	B(3) A(10)
63.	A buxom woman	A normal size woman	A(10)
64.	Couple at a zoo	Man with his arm around a woman walking in a park	A(5)
65.	Glass containing a cold drink and a straw	Ice cream sandwich	A(4)
66.	A ballroom dance	A square dance	B(5)
67.	Empty garage, with door open	A handgun	B(6,16)
68.	Long line of people waiting to go into a restaurant	An automat	B(8)
69.	Young child, sucking his thumb	Same child, playing with pots and pans	A(10)
70.	A hospital (outside view)	Line of traffic waiting for train to pass	A(8)
71.	Person stealing a car	Same person paying money to car salesman	A(6)
72.	Union picketers outside office building	Men at negotiating table	A(6)
73.	A medical journal	A detective magazine	B(6,16)
74.	Window with shade pulled	Same, with shade up showing field scene	A(5,12)
75.	Chunk of old cheese	Banana split	B(4)
76.	Priest talking to a woman	Man talking to a woman	A(5)

Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
77.	Man eating a drumstick	Man eating watermelon	B(4)
78.	Man walking down a street with group approaching on other side	Same, with group approaching on same side of street	A(9)
79.	Two men arguing	Same, but with men with their back to each other	B(9)
80.	Boy pulling girl's pigtails	Girl reading	A(6)
81.	A man drinking out of a bottle	Same, drinking out of a glass	A(10)
82.	A woman viewed at eye-level	Same, viewed from below, as if by a child	B(11)
83.	Couple in a car at a drive-in movie	Man and woman gardening	B(5)
84.	Dill pickle	Nectarine	B(4)
85.	Woman being given an Oscar	Woman with ring on her finger massaging a man's back	A(5)
86.	Celery and olives	Ripe pear	B(4)
87.	Baby with pacifier in mouth	Same, with baby looking at mobile	A(4,10)
88.	Young bird pulling worm from ground, mother watching	Mother bird feeding young	A(2) B(10)
89.	Boy and girl playing doctor and nurse	Boy and girl coloring	B(5)
90.	A roller coaster ride seen from first car	Baby kangaroo in mother's pouch	B(11)

Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
91.	A teddy-bear	A pull-toy duck	A(11)
92.	Group of women baking.	Woman with two men at a restaurant	A(5)
93.	Bag of peanuts	Milkshake	B(4)
94.	A beggar sitting on sidewalk holding tin cup	A man struggling to lift a heavy weight	A(11)
95.	Boy and girl sipping the same soda from straws	Two girls on a porch swing eating ice cream	B(5)
96.	Fig newton	Cream pudding	B(4)
97.	Woman on a bed being examined by a male doctor	Same scene, with female doctor	B(5,15)
98.	A sports car	A family car	B(5)
99.	A man passing a woman on street, not turning to look	Same, with man glancing back at woman's legs	A(5,9)
100.	View over back of mouse looking out of hole at cat watching	Mouse climbing to piece of cheese in baited trap	B(10)
101.	A room with everything in place	Same scene, with disorder and signs of being lived in	B(1,7)
102.	A man wearing a smiling mask	Same man, no mask, no expression	A(9)
103.	Tomatoes	Raw carrot	A(4)
104.	Man in jail cell, reading	Same man, sawing on bars of cell-windows	B(6,16)

Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
105.	Couple watching TV in separate chairs	Man with his arm around a woman sitting listening to music	A(5)
106.	Saltines	Creamsicle	B(4)
107.	A group of women in a steam room	Woman in a bathing suit under a Sunlamp	B(5)
108.	Masked man stealing money out of telephone box	Man reading at a desk	A(6)
109.	Cob of corn	Half cantelope	B(4)
110.	People playing shuffle board	Couple strolling on a tropical beach	A(5)
111.	A boy throwing a rock through a window	Same boy being caught by a policeman	A(2,6)
112.	French fries	Potato chips	A(4)
113.	Couple playing tennis	Group of women playing volleyball	B(5)
114.	Two thugs	Two businessmen	A(6)
115.	Courtroom	Pool hall	B(6)
116.	Frightened boy escaping down a dark street	Same boy walking along a bright street	A(6)
117.	Marshmallow cookies	Peanut Brittle	A(4)
118.	Boy standing in front of father saying, "I promise" with fingers crossed behind his back.	Landscape scene	A(6)
119.	Nurse weighing a man	Teacher talking to a little girl	B(5)
120.	A rifle	A hat	A(6)

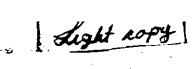| Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
121.	Fried eggs	Crisp bacon	A(4)
122.	Boy and girl playing separately	Man and woman kissing	A(5)
123.	Baby mouthing a teething ring	Baby sucking thumb	B(4)
124.	Woman taking dictation from another woman	Nurse helping a male patient into bed	A(5)
125.	Marshmallows	Candy cane	A(4)
126.	Construction worker whistling at a woman	Female bank teller talking to a woman	B(5)
127.	Box of popcorn	Milk chocolate bar	B(4)
128.	Classroom scene, student and teacher talking	Two boys arguing	B(6)
129.	People at a museum	Couple sitting in front of a fireplace	A(5)
130.	Package of chewing gum	Package of lifesavers	B(4)
131.	Seamstress measuring a man	Woman knitting	B(5)
132.	Criminal figure	A horse	A(6)
133.	Box of popcorn	Bowl of raspberries	B(4)
134.	A dagger	A pair of scissors	A(6)
135.	Several boys fishing	Young boy and girl walking toward barn	A(5)
136.	Piece of celery	Popsicle	B(4)
137.	Two couples playing cards	Woman on a man's shoulders in a swimming pool	A(5)
138.	Licorice twisters	Lollipop	B(4)

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Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
139.	Couple on a blanket at the beach	Children roasting hot dogs	B(5)
140.	Bottle of poison	Bottle of cod liver oil	A(6)
141.	Lemon	Orange	B(4)
142.	Young child eating in a high chair	Fetus in womb	B(17)
143.	Salami	Thick soup	B(4)
144.	Watermelon slice	Lettuce salad	A(4)
145.	A hand cutting a difficult knot	Same, with hand untying knot	A(8)
146.	A roast turkey on platter	A baby chick standing by egg it has just emerged from (one foot in shell)	B(11)
147.	Four letter "M's" increasing in size - small to large	Four medium size letter "M's"	B(7)
148.	A news magazine	A movie magazine	A(3) B(15)
149.	Large plus sign and large circle	Two large plus signs	B(7)
150.	A plain, well-developed man	A handsome boy of about 10	B(11)
151.	A man sitting, watching TV	Same man sitting in chair thinking	B(13)
152.	An older man feeding himself	Same man being fed by a hand	B(11)
153.	Shower room with several nude men, partition covering genitals	Woman ironing near a child with a rattle	B(5)

Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
154.	A person looking into a mirror, indistinct reflection	A wagon with one wheel missing	B(12)
155.	A large cactus, desert scene	A large clock showing	B(2,7)
156.	A view over the shoulder of a man giving a speech to a large audience	A man with his arm in a cast	B(13)
157.	Man being whipped	Woman being whipped	A(12)
158.	A painting	A mirror	B(1,15)
159.	A piece of paper with a small figure drawn near bottom centre of page	Same paper, same figure, but filling most of page	A(12)
160.	Boys about ten, playing football	Same boys playing baseball	B(14)
161.	A beaver	A butterfly	A(2) B(15)
162.	A dog standing with no leash	Same dog with leash on	B(13)
163.	A human heart	A human brain	A(13)
164.	A woman buying cake at bakery	Same woman baking a cake	A(1,11)
165.	A strung bow (no arrow)	Same bow, unstrung	B(1,13)
166.	A group of people throwing vegetables at a man carrying a PEACE sign	A group of soldiers in combat	A(14)

Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
167.	A dog running through the woods	A cat curled up by the fire	B(11)
168.	A scarecrow	A robot	A(11)
169.	A group of swans with one vulture	A group of vultures	B(12)
170.	A mother duck being followed by line of young ducks, walking	A mother hen with chicks under her wings	B(11)
171.	A crib	A playpen	A(11)
172.	Circle with square on side, corner of square tangent to circumference of circle	Same with square overlapping circumference of circle	B(10)
173.	A row of telephone poles receding into horizon, numbered	Same poles without numbers	A(7)
174.	A pretty girl, about 10	A plain, well-developed woman	A(1,11)
175.	Two men wrestling	Two men boxing	A(15)
176.	A football player catching a pass	A football player bent over ready to hike ball (rear view)	B(15)
177.	A person sleeping, dream cloud showing non-descript scene	Same with no dream cloud	A(2) B(13)
178.	Baby being bottle fed	Baby being breast fed	A(5)
179.	Numbers: 13 14 15 16	Numbers: 2 4 8 16	A(7)
180.	Apple	Orange	B(4)
181.	A toy top (spinning)	A large ball	A(7)
182.	A roaring fireplace	A hot bath	B(15)

Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
183.	A person lying in bed sick (pills on table)	A doctor with stethoscope	A(11)
184.	An organ grinder	A freak show at circus	B(12)
185.	A car wash showing dirty car going in and clean car coming out	A caterpillar crawling into cocoon, butterfly emerging	B(12)
186.	Soldiers in combat	A line of men getting shots	A(14)
187.	Man climbing rope with top swivel visible	Same with rope disappearing out of top of card	B(7)
188.	Woman trying on shoes with male salesman	Woman getting fitted for dress, seamstress working under her arm	B(15)
189.	Small child playing in sandbox	Same child climbing tree	A(14)
190.	Man sitting throwing cards into a hat	A man resting in a hammock	A(1,13)
191.	Man holding his forearm	Same with both hands on table	A(15)
192.	A cocktail lounge and bar	An amusement park	A(10)
193.	A man riding a bicycle down a road	Same man on an exercycle	B(1,13)
194.	A hamster in cage running in wheel	Same cage with hamster climbing slope to ledge	B(3) A(13)
195.	A woman sitting on rock by pond looking at reflection in water	Same person sitting on log in woods looking down	A(15)
196.	Christmas tree with presents	Birthday party table with presents	B(11)

Item No.	Picture A	Picture B	Addictive Choice & Trait Scale
197.	One ten dollar bill	Two five dollar bills	A(11)
198.	Shredded wheat	Oatmeal	B(4)
199.	Bunch of grapes	Jar of olives	A(4)

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VITA AUCTORIS

Anita Benoit Fuerth was born on September 9, 1951 in Chatham, Ontario to Gabriel and Edna Benoit. In June, 1970 she graduated from Ursuline College, "The Pines", Chatham, Ontario and in September, 1970 enrolled at Brescia College, London, Ontario. She graduated from the University of Western Ontario with the degree of Bachelor of Arts (Honours) in Psychology in June, 1974. Since September, 1974 she has been enrolled as a full-time graduate student in the Clinical Psychology program at the University of Windsor, Windsor, Ontario.

Anita Benoit Fuerth is married to Stephen J. Fuerth.