DIMENSIONALITY AND CONCURRENT VALIDITY OF THE HANDLER DAP ANXIETY INDEX

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ABSTRACT

The Handler Anxiety Index was developed to provide a measure of anxiety from the Draw-A-Person (DAP) protocol. The present study examined the dimensionality and concurrent validity of the Handler Index against two criteria, clinical diagnosis and the 16 PF anxiety scales. The results were as follows: (a) The median reliability estimate for the 20 Handler items was 0.97, (b) The Handler items were found to be heterogeneous with respect to item-total structure and saturation with drawing quality, (c) Factor analysis of the Handler Index produced six orthogonal dimensions: Poor Quality, Correction, Three-Dimensionality, Expansion-Constriction, Overinclusiveness, and Inadequate Control, and (d) There was no pattern of significant relationships in the correlations of the six Handler factors with the two independent anxiety criteria. In summary, the results of this investigation suggest that there are no subsets of drawing elements that are valid indicators of anxiety.

INTRODUCTION

The extensive literature on human figure drawings includes a variety of methods referred to as the Draw-A-Person (DAP). The best-known interpretative guides (Hammer, 1958; Levy, 1950; Machover, 1949), based on clinical experience, recommend qualitative analysis of form and content with attention to concurrent behavior. Specific interpretative hypotheses have been formulated and popularized with regard to many different aspects of personality such as body image, self-esteem, sexual identity, and anxiety level. Since an indication of anxiety level is often desired, a moderate amount of empirical research has been done on the drawing elements which have been suggested as manifestations of anxiety. However, these efforts have provided only equivocal support for the DAP as an anxiety measure (Sims, Dana, & Bolton, in press).

Several investigators have developed scoring systems for the DAP in attempts to psychometrize the intuitions and insights of clinical assessors. In the area of anxiety, three psychometric procedures have been described in the literature (Engle & Suppes, 1970; Handler, 1967; Royal, 1949). Most scale items were derived
from the traditional clinical literature and are interpreted within a psychoanalytic framework. The majority of the items included in the three scoring systems involve structural and formal characteristics of human figure drawings, while content indices are much less frequent. Handler's (1967) procedure has received the most attention by researchers, and some of the results have been supportive of its validity as an anxiety measure (Sims, Dana, & Bolton, in press).

However, no study to date has evaluated the dimensionality of the Handler system, i.e., anxiety level as measured by summing the responses to the 20 items comprising the scale, presumably because they all tap a general anxiety construct. This assumption is apparently justified because traditional clinical interpretation suggests that all 20 items are indicators of anxiety. Because this assumption of unidimensionality may not be empirically warranted, one purpose of the present investigation was to assess the dimensionality of the Handler DAP scoring system. A second purpose was to evaluate the concurrent validity of the Handler system using two independent criteria of anxiety, clinical diagnosis and a self-report measure.

METHOD

SUBJECTS

The research sample consisted of 120 persons who applied for services at the Arkansas Rehabilitation Service, 60 clients with medical disabilities and 60 clients with psychiatric disabilities. An equal number of male and female clients were selected, and medical and psychiatric diagnoses were evenly divided for the sexes. The range was 16 to 47, and the mean age was 28 years. Also, subjects had at least a sixth grade education and 60% completed at least 12 grades. The intellectual range was 90 to 127 with a mean IQ of 103. There were no significant differences between the four subsamples (male medical, male psychiatric, female medical, female psychiatric) with respect to age, education, or IQ.

A licensed psychological examiner individually administered the DAP, 16PF-Form E, Wechsler Adult Intelligence Scale (WAIS), Bender Visual-Motor Gestalt Test, and other standard tests and inventories.

SCORING SCALES

HANDLER INDEX. Instructions from the original Handler (1967) scoring system were used with the exception of two items. The alternative method provided in the scoring manual was used to score Line Pressure instead of the original item, which required data not available from the drawing administration. Detail Loss was scored according to the modification suggested for use with a single drawing. In addition, three items not included in the Handler Index (Variability of Pressure, Teeth, and Redrawing) were scored according to criteria developed by Engle and Suppes (1970).

QUALITY SCALE. The DAP Quality Scale (Wagner & Schubert, 1955) was used in judging the quality of DAP protocols. Quality was defined as effectiveness in portraying a human figure. Factors such as life-likeness, accuracy, originality, and integration of the various parts are considered, but final judgments are based on a subjective impression of the gestalt of figures. Protocols are classified in nine
categories using the descriptions and illustrations provided in the manual. The
categories range from "extremely superior" to "not recognizable as a human
being."

16PF-FORM E. The 16PF is a self-report inventory which was developed to
measure the major dimensions of the normal personality. Sixteen primary scales
correspond to established personality dimensions and there are eight secondary
scales, much broader in scope, which summarize the relationships among the
primary factors (Cattell, 1973). Form E of the 16PF (Institute for Personality and
Ability Testing, 1967) is one of five parallel forms of the test and was developed
for persons having limited cultural and educational backgrounds. Form E is
appropriate for persons 16 years of age or older and requires reading ability of
fourth grade level or above.

The secondary Anxiety (Anx) scale and the six primary scales which define it
were used as convergent criteria. The six primary scales are: Ego Strength (C),
Shyness (H), Suspiciousness (L), Guilt Proneness (O), Compulsivity (Q3), and
Ergic Tension (Q4). Four other secondary scales, including Exvia (Exv), Cortertia
(Cort), Independence (Ind), and Superego Strength (SE) were used as discriminant
criteria because they measure the major non-anxiety dimensions of the normal
personality (Cattell, 1973).

PROCEDURE

Subjects were selected from a randomized list of 1,000 rehabilitation clients.
Subjects with psychiatric disabilities were selected primarily from clients who
had received a diagnosis of psychoneurotic because a high anxiety level is a
central feature of this class of disorders. Eligible clients diagnosed as
psychoneurotic were selected, and additional subjects were chosen from clients
diagnosed as psychotic or as having personality or character disorders. (All of the
females were diagnosed as psychoneurotic while the males included 52%
psychoneurotics, 21% psychotics, and 27% personality disorders).

Clients with medical disabilities which involved generalized motor impair­
ment (e.g., Parkinson's disease, arthritis, cerebral palsy) or functional impairment
of the dominant hand or arm were excluded from the sample. Medically disabled
subjects were selected primarily from clients with orthopedic disabilities which
were judged by a physician to be unlikely to affect DAP performance. Ninety­
seven percent of the males and 73% of the females were orthopedically disabled.
The remainder had disabilities such as amputation, blindness in one eye, or
diseases of the cardiovascular and/or respiratory systems. No medically disabled
subjects had a secondary psychiatric diagnosis. Subjects were selected sequen­
tially until the sample included 30 male and 30 female medically disabled
subjects and 30 males and 30 females with a psychiatric disability.

The protocols were scored by two clinical psychology graduate students. All
120 protocols were first given Quality ratings and then scored with the Handler
Index to minimize contamination in scoring for quality and anxiety. Working
independently, the judges rated the protocols on the basis of the descriptions and
illustrations in the Quality Scale manual. Prior to scoring, it was decided that
drawings which received a Quality Scale rating of 8 (not recognizable as a human
figure) would be eliminated from the sample. One protocol received this rating,
reducing the sample to 119 subjects.

Drawings were then scored using the Handler Index and the three additional items from the Engle and Suppes Scale. Composite scores were calculated for Quality Scale ratings, Handler Index total scores, and scores on the 23 items by averaging the scores assigned by the two raters. The reliabilities of the composite (average) scores were calculated by correlating scores assigned by the two raters, and the estimated reliabilities of the composite scores were computed using the Spearman-Brown formula.

Items were correlated with Handler Index total scores and Quality Scale ratings to provide preliminary information about the homogeneity of the Handler Index. Because the Handler Index was determined to be heterogeneous in composition, the indices were organized into factorial dimensions by the principal components method and Varimax rotation. The rotated factors were correlated with Quality Scale ratings and with the two criteria (psychiatric versus medical diagnosis and 16PF scores). Partial correlations were also obtained with quality of drawing held constant.

RESULTS

RELIABILITIES

ITEMS. Interrater agreement for 19 items of the Handler Index and three additional items were determined for 119 protocols using product-moment correlations. One item from the Handler Index, Line Pressure, was eliminated from the analysis because all protocols received the same rating from one judge. All interrater correlations were 0.89 or greater with the exception of one additional item (Variability of Pressure) for which the correlation was 0.69. The median Spearman-Brown reliability estimate for the 22 composite item scores was 0.97, and all reliability estimates were 0.93 or greater, with the exception of Variability of Pressure, which was 0.82.

HANDLER INDEX TOTAL. Interrater agreement for the Handler Index totals, computed using a product-moment correlation, was 0.97. The Spearman-Brown estimate of the reliability of composite totals was 0.98.

QUALITY SCALE. For Wagner-Schubert Quality ratings, the product-moment correlation indicated interrater agreement of 0.97. The Spearman-Brown estimate of the reliability of the composite score was 0.98.

16PF-FORM E. Parallel form reliabilities have been determined for Form E of the 16PF against forms C and D. For the six primary anxiety scales utilized as convergent criteria, reliability estimates are: C (0.63), H (0.80), L (0.52), O (0.60), Q3 (0.52), Q4 (0.66), (IPAT, 1976). Scores on the secondary factors were computed using formulas given by Cattell, Eber, and Tatsuoka (1970 p. 129), and the parallel form reliabilities were estimated using a formula derived by Nunnally (1967, p. 231). The reliability estimates for the secondary factors are: Exvia (0.81), Anxiety (0.86), Cortertia (0.77), Independence (0.71), Superego Strength (0.69) (Bolton, 1979).
INTERCORRELATIONS

**CRITERIA INTERCORRELATIONS.** Product-moment correlations were computed between the two criteria, psychiatric diagnosis and 16PF scores. Diagnosis was significantly related to secondary Anxiety ($0.39, p < .01$), and to five of the six primary scales which comprise it: C ($-0.29, p < .01$), H ($-0.35, p < .01$), L ($0.12$, n.s.), O ($0.32, p < .01$), Q3 ($-0.38, p < .01$), and Q4 ($0.37, p < .01$). Psychiatric diagnosis showed significant negative correlations with two discriminant criteria, Exvia ($-0.44$, females only) and Superego Strength ($-0.32, p < .01$). Both of these relationships are consistent with results reported in the literature (Cattell, et al., 1970).

The relationships of the primary and secondary anxiety scales to diagnosis are consistent with theoretical expectations for moderate convergent validity (Cattell, 1973). Correlations were high enough to support the validity of both criteria but were low enough to justify their interpretation as relatively independent measures of anxiety.

**ITEM-TOTAL CORRELATIONS.** The 20 items which compose the Handler Index and the three additional items were each correlated with the Handler total score. The correlations were computed separately for males and females. Approximately half of the correlations were statistically significant, and the pattern of significant correlations differed somewhat between sexes. Because the items which comprise the Handler Index did not contribute equally to the total score, and some were uncorrelated (or negatively correlated) with the total score, it was concluded that the Handler Index may not be unidimensional. Consequently, the item intercorrelation matrix was factor analyzed to determine the dimensionality of the Handler Index.

**ITEM-QUALITY CORRELATIONS.** The 23 DAP items were also correlated with the Wagner-Schubert quality ratings. Again, approximately half of the correlations were statistically significant ($p < .01$), and the pattern of significant correlations differed between sexes. The variability of the item-quality correlations indicated that the items are differentially saturated with drawing quality. Some items are substantially affected by drawing ability, while others are unaffected.

**FACTOR ANALYSIS.** The pattern of item-total correlations suggested that the Handler Index is not unidimensional. Factor analysis was used to assess the dimensionality of the items and to organize them into homogeneous scales. The intercorrelation matrix of 21 composite item scores was factored by the principal components method. On the basis of the scree criterion, it was decided to retain six factors (the first 10 eigenvalues of the matrix were $4.99, 2.19, 1.60, 1.53, 1.31, 1.24, 1.06, 1.00, 0.89,$ and $0.74$). The six Varimax-rotated factors are defined in Table 1 by items with loadings greater than 0.30.
### TABLE 1
VARIMAX FACTOR PATTERN FOR 21 VARIABLES
QUANTIFIED FROM DAP PROTOCOLS\textsuperscript{a,b,c,d.}

<table>
<thead>
<tr>
<th>Items</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>$h^2$</th>
<th>$r_{tt}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shading</td>
<td>-0.37</td>
<td>0.63</td>
<td></td>
<td>0.34</td>
<td>0.47</td>
<td></td>
<td>0.57</td>
<td>0.96</td>
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<td>Hair shading</td>
<td></td>
<td>0.36</td>
<td>0.34</td>
<td>0.47</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Reinforcement</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light and heavy line</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Placement</td>
<td></td>
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<td>-0.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Omission</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>0.79</td>
<td></td>
<td>0.98</td>
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<tr>
<td>Head size</td>
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<td></td>
<td></td>
<td>0.79</td>
<td>0.67</td>
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<tr>
<td>Head to body ratio</td>
<td>0.52</td>
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<td></td>
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</tr>
<tr>
<td>Transparency</td>
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<td></td>
<td></td>
<td></td>
<td>0.74</td>
<td>0.62</td>
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<tr>
<td>Delineation line absent</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>0.71</td>
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<td>0.68</td>
<td></td>
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<td></td>
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<td>Emphasis line</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.62</td>
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<tr>
<td>Line discontinuity</td>
<td></td>
<td>-0.39</td>
<td></td>
<td>-0.03</td>
<td></td>
<td></td>
<td></td>
<td>0.37</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.64</td>
</tr>
<tr>
<td>Head simplification</td>
<td>0.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.69</td>
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<tr>
<td>Body simplification</td>
<td>0.87</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.80</td>
</tr>
<tr>
<td>Detail loss</td>
<td>0.64</td>
<td></td>
<td></td>
<td>-0.45</td>
<td></td>
<td></td>
<td></td>
<td>0.64</td>
</tr>
<tr>
<td>Variability of pressure</td>
<td></td>
<td>0.54</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.43</td>
</tr>
<tr>
<td>Redrawing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.90</td>
<td>0.85</td>
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<td></td>
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</tr>
</tbody>
</table>

|               | $35.1\%$ | $15.4\%$ | $15.3\%$ | $12.1\%$ | $11.1\%$ | $11.1\%$ |

\textsuperscript{a}Six factors were indicated by the scree criterion.

\textsuperscript{b}Loadings less than 0.30 are omitted.

\textsuperscript{c}The reliabilities ($r_{tt}$) were estimated using the Spearman-Brown formula and the interrater correlations.

\textsuperscript{d}The average commonality is 0.61; the average reliability is 0.96; the average specificity is 0.35.

The factors are summarized below:

**FACTOR I. POOR QUALITY:** The first factor accounts for 35.1% of the common variance and is two to three times as large as each of the other five factors. It is also more general in nature than the other factors and is similar to the quality of drawing factor identified by Nichols and Strumpfer (1962). This factor is evidenced in drawings which are of poor quality due to incompleteness or crudeness.

**FACTOR II. CORRECTION:** This factor, which represents 15.4% of the variance, is evidenced by an attempt to correct or improve drawings by
erasing or reworking. This factor is suggestive of the coping defense described by Handler and Reyher (1964, 1965) and Engle and Suppes (1970).

**FACTOR III. THREE-DIMENSIONALITY:** Factor III accounts for 15.3% of the variance and involves elaboration, variability, and detailing, three features which are often present in high quality, three-dimensional drawings. Like Factor II, this factor is suggestive of an attempt to cope with anxiety by elaborating drawings (Engle & Suppes, 1970; Handler & Reyher, 1964, 1965).

**FACTOR IV. EXPANSION-CONSTRICTION:** This factor represents 12.1% of the variance and is similar to the size and placement factor identified by Adler (1970). Adler reasoned that size and placement were related in that large figures tend to run off a page, while unusually small figures are frequently placed in a corner or in the upper half of a page. This notion is also consistent with the observation that small pictures confined to the corner of a page tend to be lightly sketched. These three features are traditionally interpreted as indices of constriction. Large, centrally placed figures are often drawn with a heavier line, and these three features are traditionally associated with expansiveness.

**FACTOR V. OVERINCLUSIVENESS:** Factor V, which accounts for 11.1% of the variance loads highest on Transparency, and it is also characterized by an absence of omissions or discontinuity. These drawing elements may be tentatively interpreted as an extreme concern with inclusiveness. This factor is also analogous to the coping defense described by Engle and Suppes (1970) and Handler and Reyher (1964, 1965).

**FACTOR VI. INADEQUATE CONTROL:** The final factor represents 11.1% of the variance and is defined by two items which may be tentatively interpreted as inadequate control. Large or small head size results in disproportionateness and has been interpreted as actual or feared loss of control. Vertical imbalance involves faulty orientation of the drawing on the page and has also been interpreted as indicating loss of control.

**FACTOR-QUALITY-CRITERIA CORRELATIONS.** The correlations of the six DAP-derived factors with Wagner-Schubert quality ratings provided evidence of the differential saturation of the DAP factors with drawing quality. The major DAP dimension, Poor Quality, is strongly associated with Wagner-Schubert quality ratings (0.85, \( p < .01 \)), and Three-Dimensionality is negatively correlated with quality ratings (-0.54, \( p < .01 \)). Also related to quality ratings were Expansion-Constriction (0.24, \( p < .01 \)) and Inadequate Control (0.38, \( p < .01 \)). The relationships between quality ratings and the convergent and discriminant criteria were uniformly nonsignificant.

**FACTOR-CRITERIA PARTIAL CORRELATIONS.** With the effect of quality partialed out, the relationship between the six DAP factors and the independent anxiety criteria did not exceed chance-level expectations (see Table 2). The partial correlations were very similar to the zero-order correlations, a result that is consistent with the finding that quality did not correlate appreciably with criteria. Correlations of the DAP factors with the discriminant criteria were also
The absence of significant correlations with convergent and discriminant criteria indicate the lack of validity of the DAP-derived factors with respect to anxiety.

### TABLE 2
PARTIAL CORRELATIONS BETWEEN SIX DAP FACTORS AND EIGHT CRITERIA OF ANXIETY FOR MALES (M), FEMALES (F), AND TOTAL SAMPLE (T)

<table>
<thead>
<tr>
<th></th>
<th>Criteria</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
</tr>
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<tr>
<td><strong>Diag</strong></td>
<td>T</td>
<td>0.10</td>
<td>−0.08</td>
<td>−0.07</td>
<td>0.03</td>
<td>−0.08</td>
<td>−0.01</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>0.01</td>
<td>−0.07</td>
<td>0.02</td>
<td>−0.02</td>
<td>0.00</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>0.19</td>
<td>−0.11</td>
<td>−0.12</td>
<td>0.06</td>
<td>−0.12</td>
<td>−0.16</td>
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<tr>
<td><strong>Anx</strong></td>
<td>T</td>
<td>0.04</td>
<td>−0.06</td>
<td>−0.13</td>
<td>−0.06</td>
<td>−0.02</td>
<td>−0.09</td>
</tr>
<tr>
<td></td>
<td>M</td>
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<td>0.02</td>
<td>−0.02</td>
<td>−0.23</td>
<td>−0.05</td>
<td>−0.14</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>0.01</td>
<td>−0.16</td>
<td>−0.14</td>
<td>0.09</td>
<td>−0.11</td>
<td>−0.11</td>
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<tr>
<td><strong>C</strong></td>
<td>T</td>
<td>−0.09</td>
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<td>0.04</td>
<td>0.07</td>
<td>0.06</td>
<td>0.06</td>
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<td>−0.09</td>
<td>−0.06</td>
<td>0.26*</td>
<td>0.01</td>
<td>0.12</td>
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<td></td>
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<td>0.07</td>
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<td>0.20</td>
<td>0.25</td>
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<td><strong>H</strong></td>
<td>T</td>
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<td>0.02</td>
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<td>0.14</td>
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<td>−0.14</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>F</td>
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<td>−0.20</td>
<td>−0.07</td>
<td>−0.23</td>
<td>0.11</td>
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<tr>
<td><strong>L</strong></td>
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<td>−0.08</td>
<td>−0.06</td>
<td>0.07</td>
<td>−0.09</td>
<td>−0.14</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>−0.36**</td>
<td>−0.08</td>
<td>−0.01</td>
<td>−0.28</td>
<td>−0.06</td>
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<td></td>
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<td>−0.16</td>
<td>0.22</td>
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<td>0.01</td>
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<td><strong>O</strong></td>
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<td>−0.08</td>
<td>−0.03</td>
<td>0.08</td>
<td>−0.06</td>
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<tr>
<td></td>
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<td>−0.15</td>
<td>0.04</td>
<td>−0.15</td>
</tr>
<tr>
<td></td>
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<td>−0.09</td>
<td>−0.22</td>
<td>−0.06</td>
<td>0.07</td>
<td>0.00</td>
<td>−0.05</td>
</tr>
<tr>
<td><strong>Q3</strong></td>
<td>T</td>
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*aQuality of drawing partialed out of each correlation.

* *<p >.05 (two-tailed)

** *<p >.01 (two-tailed)
CORRELATIONS OF FACTORS WITH IQ. The correlations of the DAP factors with intelligence indicated that the major dimension (Quality) is modestly and negatively related to intelligence (−0.28, \( p < .01 \)). Factor II (Dimensionality) also had a small significant relationship to intelligence (0.25, \( p < .01 \)), as did Factor VI (Inadequate Control) (0.21, \( p < .05 \)). However, these relationships disappeared when the effect of drawing quality was partialed out.

SUMMARY

1. RELIABILITY
   Training and practice in the use of DAP scoring systems can enable scorers to derive item scores of uniformly high reliability. The median reliability coefficient for the items of the Handler Index was 0.97. Wagner-Schubert Quality Scale ratings were also highly reliable as indicated by the estimated reliability coefficient of 0.98.

2. ITEM ANALYSIS
   The Handler DAP Index was developed to enable measurement of a single personality dimension, anxiety, and would thus be expected to be unidimensional and to be homogeneous in item content. However, item-total and item-quality correlations indicated that the items are heterogenous with respect to contribution to the total score and saturation with drawing quality.

3. FACTOR ANALYSIS
   The Handler Index, which has been previously assumed to be a unidimensional instrument, was factor analyzed and found to consist of six primary dimensions. All six Varimax-rotated factors were interpreted in terms of both drawing elements and psychological meaning. They are as follows: I. Poor Quality, II. Correction, III. Three-Dimensionality, IV. Expansion-Constriction, V. Overinclusiveness, and VI. Inadequate Control.

4. CRITERIA INTERCORRELATIONS
   Moderately high intercorrelations of the anxiety-related criteria, psychiatric diagnosis and 16PF scores, support the validity of the criteria. The magnitude of the intercriteria correlations (median = 0.34) is consistent with expectations for moderate convergent validity, yet demonstrates the relative independence of the criteria.

5. QUALITY CORRELATIONS
   Approximately half of the Handler items and four of the six DAP factors were significantly correlated with quality, suggesting that some of what is measured by the DAP ratings is technical drawing skill. Although the relationship of quality to the anxiety indices has not previously been investigated, quality has been demonstrated to be relevant in investigations of other variables such as adjustment and body image.

6. FACTOR-CRITERIA CORRELATIONS
   There was no consistent pattern of significant relationships in the correlations of the DAP factors with two independent criteria of anxiety, 16PF scores and medical versus psychiatric diagnosis. Because drawing quality has been shown to be a major contaminant of DAP research, the effect of quality was removed.
from the analyses. However, the partial correlations differed little from zero-order correlations because quality did not correlate appreciably with the criteria. The absence of significant criterion correlations for any of the DAP factors suggests that there are no homogeneous subsets of drawing elements which are valid indicators of anxiety.

Previous investigators (Craddick, Leipold, & Cacavas, 1962; Mogar, 1962) have suggested that projective measures like the DAP may tap qualitatively different types of anxiety than self-report inventories. Most previous correlational studies of DAP validity have used self-report measures of anxiety, including the MAS, the IPAT Anxiety Scale, and several measures of text anxiety. No prior studies have utilized psychiatric diagnosis as a criterion of anxiety, and only one study (Mogar, 1962) has used another projective technique as a criterion. With both the MAS and the Rorschach Content Test (RCT) as criteria, Mogar found more significant relationships of DAP anxiety indices to RCT scores than to MAS scores, so there may be some merit to this hypothesis. However, in the present study, the DAP-derived scores failed to correlate significantly with either of the anxiety criteria.

REFERENCES


HANDLER DAP INDEX


Levy, S. Figure drawing as a projective technique. In L.E. Abt & L. Bellak (Eds.), Projective psychology. New York: Knopf, 1950.


