

**IMPLICATION OF DELETING THE FORM  
MATCHING TEST FROM THE  
GENERAL APTITUDE TEST BATTERY**

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**May, 1994**

## Addendum

Please note that the General Aptitude Test Battery (Forms E & F) referred to within this report has been renamed the Ability Profiler (Forms 1 & 2). The name of the assessment was changed to reflect: 1) the focus on reporting a profile of score results from the instrument for career exploration purposes; 2) the technical improvements made to the assessment compared to previous forms of the instrument; and 3) the capacity to use the Ability Profiler in conjunction with other instruments to promote whole person assessment for career exploration.

## **BACKGROUND**

At the request of the United States Department of Labor (USDOL) in response to recommendations made by the National Research Council's Committee on the General Aptitude Test Battery, a panel of industrial/organizational psychologists was assembled in December, 1993, in Washington, D.C., by the American Institutes for Research to discuss and provide technical/scientific guidance regarding issues associated with the speededness of the General Aptitude Test Battery's (GATB) power tests. The power tests are: Computation (Part 2), Three-Dimensional Space (Part 3), Vocabulary (Part 4), and Arithmetic Reasoning (Part 6).

The panel recommended increasing the time limits and decreasing the number of items in three of the tests: Three-Dimensional Space, Vocabulary, and Arithmetic Reasoning. The panel noted that the Computation construct can legitimately be viewed as having a speeded component and, therefore, recommended that the Computation test remain somewhat speeded. Their recommendations were made under the following constraints:

- Although the retention of a construct linkage with the GATB validity data base is desirable, this linkage could be weakened somewhat in the interest of making genuine improvements in the GATB.
- Test administration time cannot be dramatically increased.
- Because GATB Forms E and F must be completed by January, 1995, there is not sufficient time for the development of additional test items.
- The computer-administered GATB and the paper-and-pencil GATB should be interchangeable forms of the test.

Because of these constraints and the panel's recommendation to lengthen the time limits of the true power tests of the GATB, they also recommended dropping either the Form Matching test or the Tool Matching test from the GATB in order to avoid increasing the overall time of the battery.

The Southern Assessment Research & Development Center (SARDC) was asked by USDOL's Employment and Training Administration to examine the potential implications of deleting the Form Matching test from the GATB, to document those implications, and to develop alternative procedures for computing GATB aptitude composites. This paper provides the results of these activities.

## Current Composites for Validity Generalization-GATB (VG-GATB) Applicant Referral System

### *Aptitudes Measured by the GATB*

The nine aptitudes measured by the GATB are listed below. The letter used as the symbol to identify each aptitude and the part or parts of the GATB measuring each aptitude are also shown.

| APTITUDE                     | TESTS  |
|------------------------------|--|
| G - General Learning Ability | Part 3 - Three-Dimensional Space<br>Part 4 - Vocabulary<br>Part 6 - Arithmetic Reasoning |
| V - Verbal Aptitude          | Part 4 - Vocabulary  |
| N - Numerical Aptitude       | Part 2 - Computation<br>Part 6 - Arithmetic Reasoning                                    |
| S - Spatial Aptitude         | Part 3 - Three-Dimensional Space   |
| P - Form Perception          | Part 5 - Tool Matching<br>Part 7 - Form Matching   |
| Q - Clerical Perception      | Part 1 - Name Comparison   |
| K - Motor Coordination       | Part 8 - Mark Making   |
| F - Finger Dexterity         | Part 11 - Assemble<br>Part 12 - Disassemble  |
| M - Manual Dexterity         | Part 9 - Place<br>Part 10 - Turn   |

The following are the definitions of the nine aptitudes measured by the GATB:

G-General Learning Ability. The ability to “catch on” or understand instructions and underlying principles; the ability to reason and make judgments. Closely Related to doing well in school.

V-Verbal Aptitude. The ability to understand the meaning of words and to use them effectively. The ability to comprehend language, to understand relationships between words, and to understand meanings of whole sentences and paragraphs.

N-Numerical Aptitude. Ability to perform arithmetic operations quickly and accurately.

S-Spatial Aptitude. Ability to think visually of geometric forms and to comprehend the two-dimensional representation of three-dimensional objects. The ability to recognize the relations resulting from the movement of objects in space.

P-Form Perception. Ability to perceive pertinent detail in objects or in pictorial or graphic material. Ability to make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.

Q-Clerical Perception. Ability to perceive pertinent detail in verbal or tabular material. Ability to observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation. A measure of speed of perception which is required in many industrial jobs even when the job does not have verbal or numerical content.

K-Motor Coordination. Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. Ability to make a movement response accurately and swiftly.

F-Finger Dexterity. Ability to move the fingers, and manipulate small objects with the fingers, rapidly or accurately.

M-Manual Dexterity. Ability to move the hand easily and skillfully. Ability to work with the hands in placing and turning motions.

To clarify the term “part score” as used in this paper, the following definition is provided:

A GATB part score results from the conversion of the raw score obtained on that part to a converted score. This conversion is made by means of a table provided in the appropriate GATB administration manual.

In instances in which a GATB aptitude is derived from a single test, the part score is also the aptitude score. This situation occurs with aptitudes V, S, Q, and K. All of the other aptitudes are derived from adding the constituent part scores.

The following sections on composite scores and job families are excerpted from *Validity Generalization Manual, Section B: Selection and Referral* (U.S. Department of Labor, 1984).

### ***Composite Scores***

The results of John E. Hunter’s research with the GATB (Hunter, 1983a) demonstrated that the nine GATB aptitudes combine into three general clusters or factors: a cognitive factor containing aptitudes, G, V, and N; a perceptual factor containing aptitudes S, P, and Q; and a psychomotor factor comprised of aptitudes K, F, and M. It was determined that general cognitive ability, general perceptual ability, and general psychomotor ability best predict job success. These generalized abilities are stronger predictors of job success than are the nine aptitudes working independently. For example, the psychomotor factor, made up of K, F, and M working as a composite score, is a better predictor than either K, F, or M working independently.

## ***Job Families***

Every job requires a worker function in some degree, and at some level of complexity, in relation to “Data” (information, facts, ideas, and statistics), “People” (clients or co-workers), and “Things” (machines and equipment). Levels were developed for these functions which range from the relatively simple to the highly complex. Each occupation in the *Dictionary of Occupational Titles (DOT)* includes as part of its code (4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> digits) the worker functions related to Data, People, and Things. For instance, a Machinist, 600.280-022, analyzes Data, takes instructions from People, and sets up Things.

Hunter’s research (1983b) demonstrated that several of the levels of the Data and Things worker functions could be merged and that, for purposes of aptitude testing, all jobs in the *DOT* could be grouped into a final optimum set of five job families.

The Validity Generalization-GATB (VG-GATB) applicant referral system incorporated the results of research by Hawk (1970) and Hunter (1983a, 1983b) regarding the linear relationship between aptitude and job performance, composite scores, and the job family concept. The VG-GATB applicant referral system is illustrated below:

VG-GATB Operational System: Job Family  
Classification and Composite Contribution/Weights

| <u>Job Family</u> | <u>DOT Code</u> | <u>GVN</u> | <u>SPQ</u> | <u>KEM</u> | <u>Description</u>       | <u>#DOT Jobs</u> |
|-------------------|-----------------|------------|------------|------------|--------------------------|------------------|
| I                 | T = 0           | 59 %       | 30%        | 11%        | Set-Up; Supervisory      | 398              |
| II                | T = 6           | 13 %       |            | 87%        | Feeding/Offbearing       | 400              |
| III               | D = 0,1         | 100%       |            |            | Profess.; Supervisory    | 2103             |
| IV                | D = 2,3,4       | 73%        |            | 27%        | Skilled Trades; Clerical | 3145             |
| V                 | D = 5,6         | 44%        |            | 56%        | Semi-skilled             | 6053             |

The table shows the relative contribution made by each composite to the job families; that is, the importance of each composite score within a job family for validity. For example, 59% of the Job Family I score is based on GVN, 30% is based on SPQ, and 11% is based on KFM. As the level of job complexity increases (Job Family I, IV, and III), the contribution made by G, V, and N increases. As the level of job complexity decreases (Job Family V and II), the contribution made by K, F, and M increases. (Hunter, 1983b).

### ***Form Matching's Contribution to Job Family System***

On Form A of the GATB, the Form Perception aptitude (Aptitude P) score is computed by adding the Tool Matching (Part 5) raw score multiplied by 1.981 plus the constant -8.480 and the Form Matching (Part 7) raw score multiplied by 1.080 plus the constant 20.025. (See *Manual for the USTES General Aptitude Test Battery, Section III: Development*, Table 7-3.) Sixty-five percent of the Form Perception aptitude (1.981/3.061) is determined by Tool Matching and thirty-five percent (1.080/3.061) by Form Matching. The basis for the formula for the computation of the Form Perception aptitude score is found in *Section III: Development* (U.S. Department of Labor, 1970), pages 38-39. *Section III* states that around 1952, the USES test research program conducted a comparability study "...to standardize Form A (B-1002) on the General Working Population Sample (N=4,000) for which only B-1001 data was available. ...Differential weighting of tests was required for each of the five aptitudes that are measured by more than one test. The B-1002 (Form A) tests measuring each of these aptitudes were weighted according to the *B* coefficients obtained for the corresponding tests in B-1001. ...In order to obtain weights applicable for use with B-1001- equivalent raw scores obtained by substituting B-1002 (Form A) scores in the equations obtained from the conversion studies, the *B* weight for each B-1002 (Form A) test was divided by the standard deviation of its B-1001 counterpart for the General Working Population Sample (N=4,000). A final adjustment was made in the weights and a constant was added to the weighted scores for each aptitude so that the (derived) mean and standard deviation of the composite scores for each aptitude would be 100 and 20, respectively, for the General Working Population Sample (N=4,000). ...The conversion tables are shown in Section I of the Manual for the GATB."

The Perceptual aptitude composite is computed by adding Spatial Aptitude (S), Clerical Perception (Q), and Form Perception (P) together. The individual test Form Matching composes 11.8% of the Perceptual composite.

The Perceptual composite currently is used for score calculation in only one of the five job families, Job Family I. In Job Family I, the composite weights are 59% GVN, 30% SPQ, and 11% KFM. Form Matching contributes 3.53% to the Job Family I score. Job Family I encompasses 398 supervisory and set-up jobs, which is approximately 3% of the 12,099 jobs listed in the 4<sup>th</sup> edition of the *Dictionary of Occupational Titles* (US Department of Labor, 1977).

The other four job family scores are derived from the Cognitive and Psychomotor composites optimally weighted to predict job performance for each individual job family. In the VG-GATB applicant referral system, the contribution of the Form Matching test is very insignificant.

## Implications of Deleting Form Matching

### *For Scoring*

#### *Alternative Scoring Method #1*

If Form Matching were deleted from the GATB, one method of scoring would be the computation of Aptitude P scores from only the Tool Matching test. There is precedent with the GATB for the derivation of an aptitude score from a single test. The GATB has other aptitudes, such as Verbal Aptitude, Spatial Aptitude, and Clerical Perception, that each are measured by only one paper-and-pencil test.

If Form Matching were deleted, the definition of Aptitude P would have to be changed to delete those aspects of the aptitude that currently are being measured by Form Matching alone. Aptitude P currently is defined as the “ability to perceive pertinent detail in objects or in pictorial or graphic material. Ability to make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines. Measured by Parts 5 and 7.” The words “shapes and,” “widths and lengths of lines,” and “and 7” would have to be deleted from the definition.

The Perceptual composite SPQ would still consist of aptitudes S, a recomputed P, and Q. The overlap between the old SPQ and the new SPQ would be very high because most of the new composite would be exactly the same as the old one. Both companies would contain S, Q, and Tool Matching; therefore, the correlations between the two composites would be very high.

**Table 6-2. Intercorrelations of Tests in B-1001-N=4,000, General Working Population Sample**

| Test                        | A   | B   | C   | D   | F   | G   | H   | I   | J   | K   | L   | M   | N   | O   |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| A-Tool Matching.....        |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| B-Name Comparison.....      | .64 |     |     |     |     |     |     |     |     |     |     |     |     |     |
| C-H Markings.....           | .50 | .55 |     |     |     |     |     |     |     |     |     |     |     |     |
| D-Computation.....          | .49 | .67 | .43 |     |     |     |     |     |     |     |     |     |     |     |
| F-Two-Dimensional Space...  | .53 | .47 | .40 | .51 |     |     |     |     |     |     |     |     |     |     |
| G-Speed.....                | .42 | .49 | .56 | .37 | .37 |     |     |     |     |     |     |     |     |     |
| H-Three Dimensional Space.. | .47 | .38 | .36 | .45 | .76 | .33 |     |     |     |     |     |     |     |     |
| I-Arithmetic Reason.....    | .42 | .58 | .37 | .78 | .58 | .35 | .57 |     |     |     |     |     |     |     |
| J-Vocabulary.....           | .41 | .65 | .39 | .64 | .54 | .41 | .51 | .72 |     |     |     |     |     |     |
| K-Mark Making.....          | .45 | .59 | .65 | .45 | .29 | .64 | .24 | .34 | .38 |     |     |     |     |     |
| L-Form Matching.....        | .58 | .56 | .47 | .48 | .62 | .42 | .56 | .46 | .45 | .42 |     |     |     |     |
| M-Place.....                | .20 | .16 | .32 | .15 | .21 | .31 | .19 | .14 | .09 | .33 | .24 |     |     |     |
| N-Turn.....                 | .25 | .24 | .39 | .13 | .20 | .36 | .16 | .09 | .12 | .46 | .27 | .52 |     |     |
| O-Assemble.....             | .28 | .25 | .34 | .17 | .22 | .30 | .23 | .15 | .15 | .33 | .27 | .34 | .38 |     |
| P-Disassemble.....          | .35 | .32 | .39 | .23 | .24 | .32 | .22 | .16 | .13 | .41 | .33 | .44 | .43 | .47 |

As shown in Table 6-2 above from the *Manual for the USTES General Aptitude Test Battery, Section III: Development* (USDOL, 1970), the intercorrelations of Form Matching with the other parts of the SPQ composite are almost equal (.58 with Tool Matching, .56 with Name Comparison, and .56 with Three-Dimensional Space). Tool Matching is slightly more highly correlated with Name Comparison (.64) than with Three-Dimensional Space (.47), so the new



composite would be very slightly more like Aptitude Q than Aptitude S if Form Matching were deleted.

### ***Alternative Scoring Method #2***

A second alternative scoring method if Form Matching is deleted from the GATB would be to change the GATB to measure only composites and not individual aptitudes.

Hunter's analysis in USES Test Research Report No. 44 (1983a) demonstrated that the nine GATB aptitudes combine into three factors: Cognitive, Perceptual, and Psychomotor. These factors are better predictors of job success than are the nine individual aptitudes working independently. If the scoring of the GATB were changed to measure only composites and not individual aptitudes, then the Perceptual composite would consist of Aptitude S, Aptitude Q, and the Tool Matching part score. All aptitude definitions would be eliminated. The GATB would consist of six paper-and-pencil tests and five dexterity tests measuring three general factors.

The resulting new SPQ composite would still correlate extremely high with the old SPQ composite, and it would be missing only Form Matching's contribution from the old composite.

### ***For Compliance with Expert Panel's Constraints***

Either of these two alternative approaches to scoring should satisfy the constraints under which the new forms of the GATB are being developed. Linkage to the GATB data base should be maintained. Omitting the Form Matching test would make it possible to make the Three-Dimensional Space, Vocabulary, and Arithmetic Reasoning tests true power tests without substantially increasing GATB administration time. Also, these approaches would not require any additional items to be developed for Forms E and F of the GATB.

The deletion of Form Matching would also make the computerization of the GATB a bit less problematic. The Form Matching test consists of groups of 25 to 35 shapes in one box which test takers must match with 25 to 35 shapes in another box. Thus, 50 to 70 shapes must be presented simultaneously. The difficulty of displaying all items on the computer screen and the higher resolution needed to display the smaller items make Form Matching particularly difficult to computerize.

## Technical Issues

The United States Employment Service's Assessment Research and Development Program does not have an ideal data set by which to evaluate the potential loss in validity resulting from deleting Form Matching (Part 7) from the GATB. The ideal data set would be a large Job Family I data set containing all twelve GATB part scores and criterion scores from incumbent workers in jobs for which the Perceptual composite SPQ is utilized for optimal prediction of job performance.

The GATB data base does not contain the twelve part scores. The first scores on the GATB data file are the nine aptitude scores. If an analysis to evaluate the incremental validity of deleting Form Matching were performed on a data base from any of the other four job families (II-V), the incremental validity should be zero for the Form Matching test. In Hunter's analyses the four other job families demonstrated zero incremental validity for the composite SPQ because job performance in these job families is best predicted by a combination of composites GVN and KFM.

The SARDC has two data files which contain the twelve GATB part scores and criterion scores for the Job Family II and III validation project. The Job Family II data set consists of scores for 515 individuals who worked in very low-skilled, repetitive jobs that involve feeding and offbearing machines and require little training time to learn the duties. These occupations tend to be at the lowest level of complexity in comparison with most other jobs. Examples of Job Family II occupations are: Flatwork Finisher, Cannery Worker, Conveyer Feeder-Offbearer, and Doffer. The Job Family III data set contains scores for 1808 individuals in highly complex professional/managerial occupations that involve synthesizing and coordinating data and require prolonged training to become skilled in the work. These occupations tend to be at the highest level of complexity in comparison with most other jobs. Some examples of Job Family III occupations are: Architect, Business Programmer, Actuary, Personnel Psychologist, and Vocational-Rehabilitation Counselor.

In the absence of a Job Family I data set, the SARDC utilized the Job Family II and III data files to examine the relationship between the current SPQ composite, a new SPQ composite (renamed SP1Q) with P recomputed from the Tool Matching raw score, and a new SPQ composite (renamed SP2Q) using only the Tool Matching part score in place of P. In both the Job Family II and III data sets, the current SPQ composite correlated with the new composites at .99. At the composite level, the method used for calculating the composite score matters little; these composites are practically the same.

These correlations would also be an important consideration for the current counseling system. In effect, no change would have to be made in *Validity Generalization Manual, Section C: Counseling and Test Interpretation*, if either scoring method were adopted because of the extremely high correlations between the old and new composites. In reality, no changes in the counseling system could be made until new *DOT* estimates for Aptitude P are made by occupational analysts for Job Family I occupations.

In the Job Family II data set, Tool Matching correlated with the aptitude Form Perception at .96. Form Matching correlated with Form Perception at .86. In the Job Family III data set, Tool Matching correlated with Form Perception at .95, and Form Matching correlated with Form Perception at .80. In both data sets Tool Matching correlated more highly than Form Matching with the aptitude Form Perception.

There are two areas of concern which should be addressed:

1. The effect that dropping Form Matching would have on the incremental validity of the optimally weighted composites.
2. The possible destruction of the important linkage between the old and new forms of the GATB if Form Matching is dropped from the new forms and Aptitude P is computed differently.

To explore the effect that dropping Form Matching would have on the incremental validity of the optimally weighted composites, the validity was calculated at the composite level for Job Families II and III. The SPQ validity for Job Family II was .0481, the validity for SP1Q was .0549, and the validity for SPQ2 was .0482. For Job Family III, the SPQ validity was .0632, the SP1Q validity was .0548, and the SP2Q validity was .0547. Thus, for both Job Families II and III, the change in validities at the composite level resulting from excluding the Form Matching score is negligible, albeit in opposite directions for Job Families II and III.

To explore the degree of linkage between the old forms of the GATB and new forms which would not contain Form Matching, a multiple regression analysis was conducted to determine how well Aptitude P could be predicted from the remaining eleven part scores. The initial stepwise regression was run using 1808 Job Family III individuals. The multiple R from the regression analysis is .96 with parts Tool Matching, Three-Dimensional Space, Turn, Name Comparison, Place, and Computation in the regression equation.

The regression equation was cross validated on the 515 individuals in the Job Family II data base. The resulting multiple R in the Job Family II study was .97.

These results indicate that the test scores for Aptitude P can be predicted very well from the remaining eleven tests. This finding could be an important consideration if aptitude scores will be part of the applicant referral decision, as they are with the use of Specific Aptitude Test Batteries (SATBs). The SATBs, which were developed prior to VG-GATB, require individuals to exceed minimum scores on two, three, or four aptitudes before they can be referred to an employer who has requested test-selected applicants.

The validities associated with the composites are more related to the general factor than to the individual GATB aptitudes or the GATB parts. As long as the aptitudes are correlated highly, a part of one aptitude can be dropped without much effect.

The incremental validity of adding other composites is shown in the table below from USES Test Research Report No. 45 (Hunter, 1983b).

**Table 10**

*Mean Observed Validity\* for the Categories of Job Complexity Created Using the Modified Data and Things Categories and the Implied Beta Weights for Ability Combinations; GVN = Cognitive Ability, SPQ = Perceptual Ability, KFM = Psychomotor Ability*

| <u>Complexity Levels</u> |   | <u>Validities</u> |            |            | <u>Beta-Weights</u> |            |            | <u>R</u> | <u>Number of Jobs</u> |
|--------------------------|---|-------------------|------------|------------|---------------------|------------|------------|----------|-----------------------|
|                          |   | <u>GVN</u>        | <u>SPQ</u> | <u>KEM</u> | <u>GVN</u>          | <u>SPQ</u> | <u>KFM</u> |          |                       |
| Set-up                   | 1 | 34                | 35         | 19         | 18                  | 20         | 3          | 37       | 21                    |
| Synthesize/Coordinate    | 2 | 30                | 21         | 13         | 34                  | -7         | 5          | 31       | 60                    |
| Analyze/Compile/Compute  | 3 | 28                | 27         | 24         | 21                  | 3          | 15         | 32       | 205                   |
| Copy/Compare             | 4 | 22                | 24         | 30         | 9                   | 5          | 25         | 33       | 209                   |
| Feeding/Offbearing       | 5 | 13                | 15         | 35         | 5                   | -6         | 37         | 36       | 20                    |

\* Decimals Omitted

SPQ has the highest validity at .35 of any composite for complexity level 1 (Job Family I) jobs. After applying the beta weights for all three composites, the validity for the entire battery increases to only .37, a gain of .02 validity. The loss of incremental validity from any single test would be very minimal.

One other matter for consideration is that of the validities of the individual Form Matching and Tool Matching part scores. These validities were examined in the Job Family II and III data sets by computing zero-order correlations between the part scores and criterion scores consisting of composites of supervisory ratings. In the Job Family II data set, the correlation between Form Matching scores and criterion scores was .08, while the correlation between Tool Matching scores and the criterion was .10. In the Job Family III data set, the correlation between Form Matching scores and the criterion was .09, while the correlation between Tool Matching and the criterion was .05.

A multiple regression analysis with all twelve parts of the GATB was conducted to determine the incremental validity of the Form Matching and Tool Matching parts. In the Job Family II data, neither part made a unique contribution to the prediction of job performance at the level of the third decimal place. In the Job Family III data, Form Matching did make a unique contribution; Tool Matching did not. However, the unique contribution of Form Matching was trivial in the prediction, contributing only .003 to the multiple regression coefficient.

## **Alternative Procedures for Computing New Aptitude Composites**

If Form Matching were deleted from the GATB, new composites could be calculated very easily. Under scoring method #1, Aptitude P would be computed based upon the Tool Matching (Part 5) raw score alone. Tool Matching raw scores would have to be converted to standard scores with a mean of 100 and a standard deviation of 20. The equating of new Forms E and F on Aptitude P based upon the Tool Matching part score alone should be less difficult than equating the new forms on the power tests with their extended time limits. The beta weights for Job Family I should be the same for scoring method #1 and the current VG-GATB system because of the high correlation between the new perceptual composite and the current composite.

Under the present VG-GATB system and scoring method #1, the aptitude scores for Form Perception, Spatial Aptitude, and Clerical Perception are added to form the Perceptual composite score. The Cognitive composite, Perceptual composite, and Psychomotor composite all have a mean of 300 in the general population. Each aptitude has a mean of 100 and a standard deviation of 20.

Under scoring method #2, the Perceptual composite will have a mean less than 300 because of the deletion of the Form Matching part score. The adoption of the second alternative scoring method may create the need for minor adjustments in the beta weights for Job Family I after sufficient data is available to recalculate them. Job Family I is the only job family that uses the Perceptual composite to predict job performance.

### **Conclusions**

There are a number of reasons to support the deletion of the Form Matching test, instead of the Tool Matching test, from the GATB:

1. The testing time for Form Matching is six minutes versus five minutes of testing time for Tool Matching. Administration time for the two parts is virtually identical.
2. Aptitude P is better predicted by multiple regression containing Tool Matching rather than Form Matching.
3. Tool Matching will be easier to computerize than will Form Matching.

These reasons outweigh the trivial incremental validity contributed by Form Matching in the Job Family III data set.

The consequences of dropping Form Matching from the GATB appear to be minimal due to the following factors:

1. The current Perceptual composite is correlated with the new Perceptual composites (minus Form Matching) at .99, and the differences in validities for these composites for both Job Family II and III were negligible.
2. The composite SPQ is used only in Job Family I.
3. Job Family I contains only 398 jobs out of a total of 12,099 job titles listed in the *Dictionary of Occupational Titles*.
4. These 398 jobs comprise only 2.5 percent of the work force in our economy.
5. The change to the Aptitude P definition appears to be a minor one. The change to the composite structure also would be minor.

## **Recommendations**

If there is a strong desire to shorten GATB testing time to compensate for the time added to the power tests, the dropping of Form Matching is a reasonable solution.

Either of the two strategies presented in this paper for constructing new composites is reasonable. Of the two methods, the SARDC recommends changing the current dual-test Aptitude P to an aptitude consisting of the single test, Tool Matching, in order to maintain the linkage to the present aptitudes and composites. There is ample precedent for a single-test aptitude in the GATB.

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