Personnel Assessment Form

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Technical Manual

Advancing the Science of Human Assessment since 1967.
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Chapter 1

Nature and Purpose of the PAF

Introduction

The Personnel Assessment Form (PAF) provides a convenient, objectively scorable measure of intelligence or general mental ability. The development of the PAF was inspired by the Multidimensional Aptitude Battery-II (MAB-II; Jackson, 2003). The PAF was designed to be considerably shorter in administration time than the MAB-II, while preserving its psychometric qualities, making it robust yet convenient to administer in employee selection and similar contexts.

The PAF contains two subtests, verbal and quantitative, each with a seven-minute time limit. The results of the subtests are combined to provide a measure of general mental ability or “g.” General mental ability involves the ability to reason, plan, solve problems, think in abstract terms, comprehend complex ideas, and learn quickly from experience. There are many published tests of intelligence that measure multiple abilities or aptitudes. However, a large body of research (e.g., Jensen, 1998; Ree & Carretta, 1997) has provided strong evidence that most of the variance of these measures is due to a general factor, or general mental ability. This result has been found for both paper and pencil ability tests and computerized intelligence tests (Kranzler & Jensen, 1991; Kyllonen, 1993).

Indeed, there is evidence that the incremental validity of specific abilities over general mental ability when predicting overall job performance is very small or non-existent (Schmidt, Ones & Hunter, 1992). The PAF was designed in light of these findings. It is particularly well suited to employment screening, due to its face validity. That is, many of the items are relevant and practical for use in a business context. As a reliable measure of general mental ability, as well as verbal and quantitative reasoning factors, the PAF provides insight regarding how easily applicants can be trained, adjust to new job demands, and effectively solve problems on their own. From a practical perspective, the PAF takes less time to complete than many tests of intelligence due to the reduced number of subscales. Employers have the option of administering the PAF through our efficient online or fax-in systems. Both methods provide detailed reports within minutes.

Intended Use

The PAF was designed for use in personnel selection and career counseling settings, although it is also appropriate in educational settings and basic research. The PAF is intended for the assessment of general mental ability in adults and adolescents age 16 and older.
Administration of the PAF requires respondents to have adequate English language skills in order to read and understand the written directions and questions. The PAF is intended for use with normally functioning individuals, and is therefore not recommended for use with individuals with learning disabilities, or severe psychopathology.

The PAF is available in two forms. Form A contains more difficult items, and is more accurate at a higher range than Form C. Form A is appropriate for positions that require a college or university degree, such as white-collar jobs or managerial positions. In contrast, Form C is more accurate at the lower range of scores. Form C is appropriate for positions that do not necessarily require college or university education, such as blue-collar jobs.

**Description of the Scales**

The PAF consists of one verbal subtest and one quantitative subtest. Descriptions of the two subtests are presented below.

**Verbal Subtest**

The verbal subtest measures an individual’s understanding of words and ideas. This ability is effectively measured using items relating to an individual’s accumulated knowledge of diverse topics, the number of words or verbal concepts that have been learned, and the ability to recognize conceptual similarities among objects.

**Quantitative Subtest**

The quantitative subtest measures an individual’s reasoning and problem solving abilities. The items in this subtest require generating solutions to various numerical problems. These problems require the respondent to extract the necessary elements and to use these elements to arrive at a correct answer quickly.

**Interpretation of PAF Test Scores**

The PAF is a brief test of general cognitive ability. A high overall score on the PAF suggests facility in learning new concepts, the ability to effectively solve problems independently and readily adjust to new job demands. On the other hand, a low overall score may suggest difficulties in learning new material efficiently and thoroughly, and the possibility of requiring more supervision and extra training in order to effectively perform important job-related tasks and follow standard procedures documented in training materials and other written material.

It is important to recognize that the PAF provides an estimate of one’s *ability* to perform on the job. This test does not offer any information about one’s *motivation* to perform the job, which is also an important predictor of job performance. For example, the PAF does not measure one’s ability to compensate for lower test scores through hard work and the motivation to succeed. Therefore, it is strongly recommended that PAF results be evaluated in conjunction with other information about the applicant including personality, skills, and experience.
The PAF report provides both *raw scores* and *percentile scores* for the verbal subtest, the quantitative subtest, and overall general mental ability. The verbal and quantitative subtests are combined to derive an overall score of general mental ability.

The PAF contains a total of 57 questions (36 measuring verbal ability and 21 measuring quantitative ability). The raw score indicates the number of questions the job candidate answered correctly. The percentile score indicates the percentage of people from a relevant comparison group of job applicants who received a lower raw score than the job candidate. For example, if a job candidate received a percentile score of 66, this would indicate that 66% of job applicants in the comparison group received a lower score than this job candidate.

It is important to not confuse percentile scores with *percentage scores*. *Percentile* scores allow comparison of an applicant’s score with a large group of other people who have taken the test. *Percentage* scores simply reveal the number of items that were answered correctly out of the total number of items (i.e., 15/20 is 75%).

**Question Format**

The PAF makes use of a multiple-choice format. This item format is ideal for automated presentation, scoring, and interpretation. Thus scoring and interpretation do not require professional judgment.
Chapter 2

Validity of Cognitive Ability

The predictive validity of a selection instrument refers to the extent to which the instrument can predict the best job performers from a pool of applicants. Statistically, predictive validity is computed by correlating ratings of an employee’s job performance with their initial scores on the selection instrument. Increased predictive validity is evidenced by higher correlations between the selection instrument and later job performance. The use of hiring methods with increased predictive validity leads to better selection decisions.

One commonly held assumption about validation studies is that a new study is required in each situation, for each job. Schmidt and Hunter (1977) challenged the idea of the situational specificity of validity coefficients. Their examination of hundreds of validation studies of general mental ability tests led them to the conclusion that the inconsistencies in validity coefficients across studies could be attributed to statistical artifacts such as:

a) The restricted range of scores in each study (i.e. only the high scorers on the selection test are selected for the job, so there is no criterion data for low scorers on the selection test);

b) The low reliability of the criterion (e.g. job performance) measures;

c) The small sample sizes that were used in most of the studies (Pearlman, Schmidt & Hunter, 1980).

Using a procedure called meta-analysis, designed to aggregate results across many studies, Schmidt and Hunter (1977) determined that it is possible to combine validity coefficients for similar predictor and criterion measures reported in different validation studies. Meta-analytic techniques allow for the combination of validity estimates across studies and correct for the effects of the statistical and measurement problems listed above. Meta-analytic techniques involve weighing the results from each separate validity study according to its sample size. Therefore, studies based on meta-analysis can provide accurate estimates of the average validity for a given predictor and criterion (i.e. general mental ability and job performance). If the meta-analysis database is large and if it adequately represents the type of job in a specific situation, then there is a strong case for using the validity generalization data.

Numerous studies have found that general mental ability is the best predictor of job performance across a variety of employment settings. In a very large meta-analytic database consisting of over 32,000 employees in 515 widely diverse jobs, Schmidt and Hunter (1998) reported that the validity of general mental ability for predicting
job performance was .58 for professional-managerial jobs, .56 for high-level complex technical jobs, .51 for medium complexity jobs, .40 for semi-skilled jobs, and .23 for completely unskilled jobs. The validity coefficient for the medium complexity jobs (.51) includes 62% of all the jobs in the U.S. economy. Medium complexity jobs include skilled blue-collar jobs and mid-level white-collar jobs, such as upper level clerical and lower level administrative jobs. These authors concluded that the main reason intelligence is related to job performance is that intelligent people have a greater ability to acquire job knowledge. That is, intelligence leads to acquiring a larger amount of job related knowledge, and acquiring this knowledge more rapidly. Increased job-related knowledge results in higher job performance.

A meta-analysis of over a thousand studies, conducted by Hunter and Hunter (1984), provides evidence that cognitive ability measures are more valid than many other commonly used selection methods for predicting job performance. The results of this meta-analysis are illustrated in Figure 2-1.

**Figure 2-1. Validity of different predictors of job performance**

Numerous other empirical studies provide support for the finding that measures of general intellectual ability are strong predictors of job performance. In one meta-analysis comprising 52 validation studies and 5,872 participants, the investigators found an estimated true validity of cognitive ability tests of .68 for predicting training criteria. These particular studies examined electrical assembly, telephone technicians and mechanical jobs (Levine, Spector, Menon, Narayanan, & Cannon-Bowers, 1996).

Another meta-analytic study used multiple regression models to compare the relative validity of general mental ability with specific abilities for predicting job performance in a sample of 1036 US Air Force personnel from seven blue-collar jobs...
Validity of Cognitive Ability

jobs. Using hands-on performance tests and work sample tests as the criteria, the investigators found the average validity of general mental ability across the seven jobs was .40. The addition of specific ability measures to the general mental ability measure only increased the predictive validity by an average of .02 (Ree, Earles, & Teachout 1994).

In a meta-analysis of 698 published studies of clerical occupations, Pearlman, Schmidt, and Hunter (1980) found that general mental ability was a valid predictor of both training success and job proficiency for a variety of clerical occupations, and this generalized across organizations. Schmidt, Hunter, and Caplan (1981) provided meta-analytic evidence for the validity of cognitive ability predicting job performance for two groups of craft jobs in the petroleum industry. They found that general mental ability had a predictive validity of .26 with operator jobs and .30 with maintenance jobs. Similarly, Hirsh, Northrop, and Schmidt (1986) reported validity generalization results for law enforcement occupations (e.g. security guards, police officers, bailiffs).

Outside of North America, Salgado and Anderson (2002) looked at cognitive ability testing in Europe. They performed a meta-analysis of British and Spanish studies of general mental ability tests and found an average predictive validity of .44 for job performance ratings. Their review included several types of jobs, including clerical, driver, and trades.

The link between job performance and cognitive ability is intuitive. Any job that requires speed, reasoning, memory, planning or change is implicitly contingent on cognitive ability (Hunter, 1983). Specifically, “ability determines the extent to which the person masters the knowledge required for efficient and excellent performance” (Hunter, 1983, p. 257).

Advantages of Using a Valid Selection Tool

The validity of a selection measure bears directly on the subsequent productivity of a job applicant. The predictive validity coefficient is directly proportional to the practical economic value of the assessment method. As shown in Figure 2-2, higher test validity leads to increased productivity. However, productivity increases even when a test with modest validity (.20) is used. In addition, Schmidt, Hunter, Outerbridge, & Goff (1988) found the validity remained constant even after five years of job experience, despite the fact that other studies have questioned whether or not the validity of general intellectual ability decreased over time.

Cognitive Ability and Job Complexity

Some researchers argue that general intelligence is only a valid predictor for specific aspects of performance (e.g. Hunter & Hunter 1984). These authors found that cognitive ability is not as useful a predictor for routine, well-learned job functions as it is for novel job tasks. In fact, there is evidence that as job complexity decreases so does the validity of the cognitive ability measures (Gottfredson, 1997; Hunter & Hunter,
1984). For example, the mean validity for a managerial position was .53, while the mean validity for a vehicle operator was only .28 (Hunter & Hunter, 1984). However, other psychological characteristics, such as personality and psychomotor abilities, become important predictors for occupations with varying levels of complexity.

**Generalizability Across Job Families**

The empirical support for the predictive validity of general intelligence is found across a variety of occupations, including food service managers, pilots, psychiatric aides, police officers, and computer programmers (e.g., Hunter & Hunter, 1984; Ree, Earles, & Teachout, 1994; Pearlman, Schmidt & Hunter, 1980). Although the specific functions of the aforementioned occupations differ, the ability to process information quickly, problem-solve, and to adapt well to change is consistent. In fact, a meta-analysis conducted by Hunter and Hunter (1984) found that across nine different job families (e.g., salesperson, industrial worker, and manager) the mean validity of cognitive ability as a predictor of a training success criterion was .54, and .45 as a predictor for a job proficiency criterion. Hunter and Hunter (1984) state that, “there is no job for which cognitive ability does not predict training success” (p. 80).

**Incremental Validity of Cognitive Ability with Alternative Predictors**

Studies indicate that there is no predictor of job performance that is comparable in validity to measures of general cognitive ability (e.g., Hunter & Hunter, 1984). However, some alternative predictors, such as integrity tests and reference checks, increase the predictive validity of job performance when used in combination with measures of general intellectual ability (e.g., Schmidt & Hunter, 1998). Table 2-1 illustrates this increase in predictive validity by adding a second predictor to a test.
Validity of Cognitive Ability

Table 2-1. Predictive validity for overall job performance of general mental ability scores combined with a second predictor using multiple regression

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Validity (r)</th>
<th>Multiple R</th>
<th>Gain in validity</th>
<th>% Increase in validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>GMA tests</td>
<td>.51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrity tests</td>
<td>.41</td>
<td>.65</td>
<td>.14</td>
<td>27%</td>
</tr>
<tr>
<td>Conscientiousness tests</td>
<td>.31</td>
<td>.60</td>
<td>.09</td>
<td>18%</td>
</tr>
<tr>
<td>Structured employment interview</td>
<td>.51</td>
<td>.63</td>
<td>.12</td>
<td>24%</td>
</tr>
<tr>
<td>Assessment centers</td>
<td>.37</td>
<td>.53</td>
<td>.02</td>
<td>4%</td>
</tr>
<tr>
<td>Reference checks</td>
<td>.26</td>
<td>.57</td>
<td>.06</td>
<td>12%</td>
</tr>
</tbody>
</table>

Adapted from Schmidt & Hunter, 1998

of general mental ability. The first column in Table 2-1 shows the mean validity of several selection methods as found in meta-analytic studies. The subsequent columns show the gain in validity from adding additional selection instruments. Thus, other selection tools can be used in addition to a test of general mental ability, in order to maximize the predictive validity of the selection system.

Test Fairness

It is critical that employment testing is fair to all applicants and focuses on measuring knowledge, skills, and abilities specifically related to job performance.

Research has clearly established that cognitive ability testing is valid, fair, and the single most powerful predictor of successful performance on the job (Schmidt & Hunter, 1998). However, it is important to remain vigilant about proper administration of the test and the use of test scores in order to ensure that minority applicants do not experience an unfair disadvantage.

Research indicates that minority applicants may not employ optimal test-taking strategies and may experience higher levels of test anxiety (Ryan, 2001), which can exacerbate the negative effects of improper test administration procedures. Test anxiety can be minimized by having the test administrator take the extra time needed to ensure that all test instructions are clear, and that applicants are not confused and do not feel rushed when instructions are provided. It can be helpful to provide examples of test questions and maintain a testing environment that is free from distractions.

It is also very important that PAF results be considered together with other relevant information about the applicant before making final selection decisions. Other criteria to consider may include education level, previous training and experience gathered from relevant positions, as well as personal references that can attest to the competence of the applicant. It is important to consider all the information presented,
give appropriate weight to both test and non-test criteria, and to avoid placing too high an emphasis on a single test score. Failure to adhere to these guidelines may present a disadvantage to minority applicants.

It is good practice to maintain flexibility in terms of interpreting results, in that cognitive ability test scores contribute only one piece of the information that should be considered along with other applicant qualifications relating to skills, experience, and personality traits. Generally, managers and other hiring decision makers should try to avoid any patterns or practices that may lead to a selection bias for specific applicant groups.
Chapter 3

Administering and Scoring the PAF

Administration of the PAF

The PAF is a standardized test requiring careful attention to instructions and time limits. Only if standard administration procedures are followed will results be interpretable. The PAF can be administered online or via paper and pencil with SIGMA's fax-in answer sheets.

Fax-in Guidelines

Proctoring of the PAF

Although instructions and timing can be automated, it is important that testing be adequately monitored. For group administration, it is desirable to have a test supervisor for the first 25 respondents and one proctor for each additional 25 respondents or fraction thereof. For individual testing, an examiner or proctor should be in the room at all times during testing. This chapter highlights examiners’ instructions for group administration, but they also apply to individual administration with only slight modification.

Required Materials

To administer the PAF, the test booklet and fax-in answer sheet are needed. In addition, the test administrator will need a stopwatch and at least one sharpened pencil (No. 2½ or HB) per respondent. Spare pencils should also be on hand. One piece of blank paper should be made available to each respondent for computations during the Quantitative subtest. The use of external resources, such as a dictionary, calculator, or other electronic devices that may be used as a source of information or test aid are not permitted.

Preliminary Testing Instructions

The examiner should have copies of all test materials and be prepared to answer questions raised by respondents. Certain statements in this section are to be read aloud; these are printed in italicized type. Statements not in italics are advisory material for the supervisor and are not to be read aloud. Both subtests are rigorously timed at seven minutes each. The examiner should follow these time limits exactly, and be sure that all respondents are working on the correct subtest during the specified time.

It is also very important for the examiner to ensure that all verbal instructions are clear and that respondents feel prepared to proceed with the test. The examiner should
encourage respondents to ask questions if they feel that any part of the instructions are unclear. The examiner should remain serious and committed to maintaining the integrity of the testing procedures, yet friendly and accommodating in order to make respondents feel comfortable in the testing environment.

Testing Schedule

Allow approximately two to three minutes for respondents to read instructions for each subtest. Both subtests require exactly seven minutes of administration time. It is extremely important that this time limit be observed exactly for each subtest in order to obtain an accurate assessment of ability level. The Verbal subtest of the test should normally precede the Quantitative subtest; each requires approximately 10 minutes for complete administration, including instructions.

Seating

Respondents should be seated so that others’ responses are not easily seen.

Verification of Respondents Seating

Please ensure that there is a mechanism in place for examiners to verify that the individual taking the PAF is indeed the job applicant or intended test taker (e.g., check identification).

Distribution of Test Materials

If a number of respondents are to be tested at one time, it is good practice to distribute materials before respondents are seated. If a smaller number are to be examined, pencils, booklets, and answer sheets may be distributed after they are seated. As soon as respondents are seated the examiner should say:

\[ \text{Do not open your test booklet or make any marks on your answer sheet until instructed to do so.} \]

Depending on the length of time required to distribute the materials, the examiner may wish to repeat this instruction.

Supervision During Testing

After all materials have been distributed, the examiner should read the following:

\[ \text{The test that you are about to take, called the Personnel Assessment Form, is designed to assess levels of ability in two different areas. The assessment consists of two timed subtests, a Verbal Subtest and a Quantitative Subtest. Special instructions and sample problems are provided before each section. Please ensure that you read all of the instructions carefully. Once you have read the instructions and tried the sample problems, you may ask me questions about anything that is not clear. It} \]
is best to ask any questions you have before you begin the timed portion of the subtests. If you have any problem during the timed portion, raise your hand and someone will be available to help you. You should try your best on each of the subtests. The subtests are timed; work on the subtests only during the time specified. Do not return to an earlier subtest nor go on to a later subtest until told to do so. Please do not make any marks in the test booklet.

The examiner should next begin reading aloud the instructions from the PAF answer sheet, and should answer any questions that respondents might have. Any respondents having difficulty with these instructions should be assisted.

While reading these instructions, the examiner should check to make sure that respondents have not opened the PAF test booklet. Any respondents who have done so should be asked to close the test booklet and look at the PAF answer sheet from which the examiner is reading.

When all of the general instructions have been read, the examiner should ask,

Are there any questions about the overall format of the test or about how to record your answers?

During testing, the examiner and proctors should move quietly about the room, and be ready to give assistance, replace a pencil, or answer questions.

Answering Questions

Interpretation or clarification of item content should be avoided. If a question does arise regarding a specific item, the examiner should say:

Answer as you think best [or a similar phrase].

Specific Testing Instructions

The following instructions should be read before the Verbal subtest and again before the Quantitative test. Once respondents complete the information requested on the answer sheet, say:

Please read the general instructions carefully.

Pause to give respondents a few minutes to read the page. Once they appear to be finished, say:

You will have seven minutes to work on each section. You may start the timed portion of this subtest when you are ready. Once you start, you should work on each subtest only during the time specified. Do not go back to a previously completed subtest, nor go on to the next subtest if you happen to finish before time is called. This point is extremely important. Work on each subtest only during the time specified.
If you are not certain of the correct answer to any of the questions, try to eliminate as many of the alternate answers as you can. Your score on each section will be the number of questions you have answered correctly. There is no penalty for guessing. Mark all answers on the answer sheet provided, and mark only one answer per question. If you change your answer, erase it thoroughly. Do not mark your answers nor make any stray marks in the question booklet.

Does anyone have any questions before we begin? [Pause for questions]. Were any of the instructions unclear or would you like me to repeat or explain anything before we begin? If you have any questions after we have started, raise your hand and someone will be available to help you.

**Instructions for Verbal Subtest**

The examiner should say:

*Turn to the instruction page for the Verbal subtest, and read it carefully. [Pause]. Each question is followed by five possible answers from A to E. You are to choose the one answer that is most correct and darken the appropriate circle on your answer sheet. You will have seven minutes to attempt to answer all questions in this section. Work on the test only during the time specified. Are there any questions before we begin? [Pause]. Turn the page and begin working. [Start timing].*

After seven minutes say:

*Stop working. Put down your pencil and close your test booklet. Check to make sure that you have completely erased all stray marks and changed answers on your answer sheets.*

**Instructions for Quantitative Subtest**

The examiner should say:

*Turn to the instruction page for the Quantitative subtest and read it carefully. You are to select the answer from A to E that best answers the question. You will have seven minutes to attempt to answer all questions in this section. Are there any questions? [Pause]. Turn the page and begin working [Start timing].*

After seven minutes say:

*Stop working. Put down your pencil and close your test booklet. Check to make sure you have completely erased all stray marks and changed answers.*
Before handing in your materials, check over your answer sheet to be sure you have completed all identification information requested.

Booklets, answer sheets, and pencils should be collected at this time.

Test Security

It is extremely important that copies of the PAF booklet do not fall into the hands of nonprofessionals and/or potential respondents. When group testing is undertaken, copies of all materials should be counted before and after testing. When testing is completed, it is important to collect all materials from respondents before they leave the room. Also, ensure that none of the respondents bring cellular phones or other electronic devices into the room. The unauthorized release of the test booklets and/or scoring keys to potential respondents is unfair to others and compromises ethical testing practices.

Scoring the PAF

The PAF is scored automatically using the SigmaFax Scoring Service. Before faxing an answer sheet, please make sure that the respondent has filled in his or her name. Fill in the fax number at the top of the form to which the report is to be returned.

The PAF can be scored in four simple steps:

1. The respondent answers the items by filling in bubbles on a printed answer sheet.
2. The form is faxed to SIGMA’s toll-free number, dedicated entirely to the scoring of assessments.
3. The scoring system reads the fax, scores, and analyzes the results.
4. Reports are automatically returned by fax within minutes.

Getting The Most Out of SIGMA’s Fax-In Scoring System

1. Please ensure that your fax machine is functioning properly.
   a. If a fax machine produces “track marks”, this will often interfere with SIGMA’s scoring mechanism. When either light or dark marks appear on the incoming fax transmission, the PAF automatic scoring mechanism will misread responses, often resulting in an unscorable report. One way to check your fax machine for scanning problems is to copy a page with text using the fax machine, then examine it for missing or dark lines.

2. Please ensure that respondents understand the PAF instructions.
   a. Please read this complete chapter to understand proper test administration procedures.
3. If a respondent makes an error on the answer sheet, please use an eraser to completely remove the incorrect response, or correction fluid to “white out” pen marks.
   a. Crossing out responses is not a valid means for correcting errors. This will result in duplicate responses, making that question unscorable.

4. Fill in the return fax number, particularly if it is different from the number SIGMA has on file.

5. Do not use photocopies of answer sheets, or reuse answer sheets for different candidates.

6. Please ensure that the fax is transmitted in the following manner:
   a. Straight, not on an angle. Use your paper guides to ensure a straight paper path.
   b. If possible, send title side first. Upside down faxes can be processed, but the time/date information from the fax machine may overwrite important parts of the form.
   c. Do not send a cover page. Extra pages are printed out as error pages and must be matched to forms stored digitally. Unless there are problems scanning, forms are never seen or printed by an operator at all.
   d. The most important marks are the four blocks in the corners, the form-code in the top left of the form, and the serial number at the bottom. If these are modified or obscured in any way, delays in processing can result.

If you do not receive a PAF report…

1. If you don’t receive a report within 15 minutes, the quickest way to have it processed is to resend the answer sheet. Slight variations in the fax transmissions may solve the problem.
   a. If your fax machine is set to “Standard Mode”, try adjusting this to “Fine Mode” or “High Resolution”. For a single answer sheet this typically increases the send time by about 50%-100%.

2. If you still have not received your PAF report, please call with the serial number of the answer sheet and the fax number to which the report should be sent. We will work quickly and efficiently to return PAF results associated with valid answer sheets. Note that if an error occurs at night, or on the weekends, we will be unable to manually process it until the following business day. Our regular office hours are Monday to Friday 9:00 AM and 5:00 PM Eastern Standard Time.

   If you receive an Error Message, please see Figure 3-1 to determine what action you should take.
Online Administration Guidelines

Our SigmaTesting platform, available online at www.SigmaTesting.com, allows you to easily administer, score, and access reports with your SigmaTesting.com account.

Proctoring the PAF online

SIGMA strongly recommends that the PAF be administered in a proctored environment. With most SigmaTesting.com accounts it is possible to email instructions to clients/applicants however, the PAF is the exception. This gives the account administrator the option to either administer the PAF directly on that computer, or print test-taking instructions to administer in a supervised environment on another computer. The timing of the PAF is automated; however, a proctor should be present to answer any questions and to reduce the likelihood of sharing responses.

Required Materials

Respondents should be given a spare piece of blank paper and a pencil for the Quantitative subtest.

General Instructions

Respondents will need to visit www.SigmaTesting.com to enter the test code and password. The PAF requires the latest version of Macromedia Flash Player.

### Figure 3-1. PAF Error Messages

<table>
<thead>
<tr>
<th>Error message</th>
<th>Explanation/Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial number on answer form has already been used (Duplicate serial number)</td>
<td>We have already received an answer form with the same serial number. Duplicates will not be processed. It may also mean that the serial number was incorrectly identified. If the error report contains a serial number you did not send, but the name is correct, then try resending.</td>
</tr>
</tbody>
</table>
| Too many missing or duplicate responses.                                     | Either there were too many answers for each question, or too few answers for a valid report.  
                                  | Too many missing responses:  
                                  | If the responses are light, try to darken them.  
                                  | Too few answers may also be caused by dropped answers due to white lines on the fax machine caused by defective scanners stuck "off".  
                                  | Too many duplicate responses:  
                                  | If an answer has been filled in with more than one response for A, B, C, or D, this is considered a duplicate response.  
                                  | This error may also be caused by misread answers due to dark streaks on the fax machine caused by defective scanners. |
| Serial number on answer form not in database.                               | We do not have that serial number on file. If the error report contains a serial number that you did not send, but the name is correct, then try resending. |
proctor should ensure that each respondent is able to enter the online system. Give respondents adequate time to read instructions.

**Answering Questions**

Interpretation or clarification of item content should be avoided. If a question does arise regarding a specific item, the examiner should say:

*Answer as you think best [or a similar phrase].*

**Scoring**

Once the respondent has completed the assessment, the administrator must log into their SigmaTesting.com account. Reports are generated automatically. Please refer to the tutorial in the SigmaTesting.com account for detailed instructions on how to use your SigmaTesting.com account.
Psychometric Properties of the PAF

**Standardization of the PAF Form A**

The normative sample for the PAF Form A is comprised of 363 North American university students (136 Males, 227 Females) with a mean age of 20 (SD = 4.04). Inspection of the distribution of their scores, as well as their IQ and percentile scores in a widely used standardized intelligence test revealed that this group was somewhat higher in cognitive ability than the general population. For this reason, the PAF Form A is recommended for use in selection contexts where candidates are likely to have a post-secondary education.

**Standardization of the PAF Form C**

The normative sample for the PAF Form C was 245 blue-collar employees. An inspection of the distribution of their scores, and of their IQ and percentile scores in a widely used standardized intelligence test confirmed that this sample was broadly representative of the general population in cognitive ability.

**Reliability**

Goffin, Gellatly, Paunonen, Jackson, and Meyer (1996) examined the reliability of the PAF (Form C) in a sample of 88 first-line supervisors in the food service industry. The average age of the supervisors was 36 years, the majority (55%) were male and had a high school education (65%). Results revealed the following internal consistency (alpha) reliabilities for each subscale: .89 for PAF verbal, .87 for PAF quantitative and .94 for the overall score.

Reliability estimates for the PAF A in the standardization sample described above indicated good internal consistency reliability. The alpha reliability values for this sample were .82 for PAF verbal, .78 for PAF Quantitative, and .85 for the overall score.

**Correlation of the PAF with other Measures of General Mental Ability**

The PAF has been correlated with two established measures of general mental ability, the MAB-II and the Wonderlic Personnel Test (WPT Manual, 2002). In the case of the MAB-II, scores for the PAF Form A were correlated with the aggregated scores for Comprehension, Arithmetic, and Similarities on a group of 363 individuals who were above average in intelligence. The resulting correlation was .80, supporting the interpretation that the tests are measuring largely the same characteristic.
PAF Form C scores for 245 individuals were correlated with scores for these same individuals for the Wonderlic Personnel Test. The resulting correlation was .85, again supporting the conclusion that the respective tests are measuring the same characteristic.

**Correlation of the PAF with Measures of Job Performance**

Gellatly, Paunonen, Meyer, Jackson, and Goffin (1991), and Goffin and colleagues (1996) report on the validity of the PAF on a sample of 88 first-line supervisors in the food service industry. Using PAF Form A Verbal and Quantitative scores separately, a set of criterion scores for Public Relations, Administration, Communication, Management, Policy Following, and Routine Job Tasks, yielded a Cohen set correlation value (R2) of .26 (p < .05). The Cohen set correlation takes into account all significant canonical variates. For individual criterion measures, the PAF Verbal scale correlated .35 with Communication (preparing written reports and verbal communication) and the PAF Quantitative scale correlated .20 and .25 with scores for Administration and Communication, respectively.
References


