DEVELOPING AND USING WEIGHTED APPLICATION BLANKS:
AN EXPERIENTIAL EXERCISE

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ABSTRACT

Development and use of effective weighted application blanks begins with an analysis of procedures required in the developmental process. An experiential exercise is presented which gives a "hands-on" experience in developing and using weighted application blanks. The exercise was developed to aid conceptual and operational understanding of procedures in weighted application blank development. The hypothetical data used were developed solely for the purposes of the exercise. Upon completion, the individual should have a keen insight into the development and use of weighted application blanks.

INTRODUCTION

Learning Objectives

1)   To understand the logic and systematic procedures for developing weighted application blanks (WABS).

2)   To give the individual a "hands-on" experience in developing WABS.

3)   To develop an awareness of the possible uses, implications, and ramifications of using WABS.

Materials Needed:

1)   Pencil and calculator.

General Instructions:

1)   Read the overview prior to beginning the exercise.

2)   Read the introductory material for each section as you come to that section. Then, follow specific instructions given for each section.

NOTE: Each section builds on previous ones, hence it is important to understand each section before moving on.

OVERVIEW

Selection and placement of individuals is one of the most difficult problems facing an organization. Improper (i.e., discriminatory) selection and placement can have far-reaching repercussions. Selection and placement techniques have been developed and refined that give management a foundation for basing selection decisions. One of these selection techniques is the Weighted Application Blank (WAB) [3][1].

A WAB ". . . provides one systematic method for determining which personal factors are important in specific occupations and how to use them in selection," [3, p. 5]. The WAB attempts to identify what personal factors reliably differentiate groups of potential desirable and undesirable employees. By identifying personal factors of job applicants, a rapid screening of the applicants is possible. The results, along with other information, can be used to enhance the selection and placement of individuals in organizations.[2]

There are numerous studies that statistically support the notion that WABs are successful in differentiating potential desirable and undesirable employees [2; 6]. One study found that even in relatively low-level jobs with modest hiring and training costs, a large savings was obtained by using a WAB [4].

The potential to an organization for proper use of a WAB is not however, without limits. One problem is that WABS tend to lose predictive efficiency over time. Another obstacle is that practitioners and researchers simply do not know how to design and develop WABS. An experiential exercise which presents a step-by-step method for development may foster continued emphasis on their use and promote renewed interest in successful selection and placement techniques.

The procedure for developing a WAB is straightforward:[3]

1)   Choose an appropriate criterion.
2)   Identify criterion groups.
3)   Select application blank items to be analyzed.
4)   Specify item response categories.
5)   Determine item weights.
6)   Analyze independent samples for cross- validation.
7)   Set WAB scores for selection.

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[1] Much of the material presented has been adapted from Development and Use of Weighted Application Blanks, by George W. England, Rev. Ed., Industrial Relations Center, University of Minnesota, 1971.

[2] The results obtained through the introduction of a WAB should not be the sole basis for making selection decisions. See, Pace, Larry A. and Lyle F. Schoenfeldt, "Legal Concerns in the Use of Weighted Applications," Personnel Psychology, Vol. 30 (1977), pp. 159-16 6.

[3] This is the basic procedural outline as indicated in England (1971), however, some steps have been modified for this exercise.

A DILEMMA

A company that employs a large number of people is faced with a problem that has cost thousands of dollars over the past few years. Many employees hired in the past two or three years left the company after a very brief employment period. Management is even more concerned since the company is trying to place individuals in jobs which resulted in literally thousands of applicants for relatively few positions. A technique that will determine what individuals appear to be potentially desirable and, at the same time, help screen out applicants that appear to be undesirable is much needed.

CHOOSING A CRITERION

The whole WAB development process determines what personal factors predict a particular criterion. The systematic method for developing WABS begins with determination of a particular criterion that differentiates between potentially desirable and undesirable employees. It is critical to identify the most appropriate criterion that makes this differentiation. However, before a criterion can be used, it is necessary to evaluate its characteristics and to ascertain the criterion's appropriateness.

With the problem presented, management has determined that hiring individuals who will remain with the company for a number of years is crucial. Therefore, management believes that desirable employees will be those having long "job tenure" with the firm. Thus, the criterion chosen is job tenure.

Instructions: With the following partial list of characteristics [2], circle the appropriate choice based on whether that characteristic should be necessary--(N), desirable--(D), or undesirable--(U) for the criterion of job tenure. Then, compare your answers with the discussion that follows.

CRITERION

Characteristics	Job Tenure		
Reliable	N	D	U
Representative	N	D	U
Related to other criteria	N	D	U
Predictable	N	D	U
Measurable	N	D	U
Relevant	N	D	U
Uncontaminated and bias-free	N	D	U

Characteristic	Discussion
Reliable	No matter what criterion is ultimately chosen, it has to be reliable. The reliability of a criterion is necessary for pre diction purposes. In this particular instance, job tenure appears, at least for the present time, to be a reliable criterion. Necessary
Representative	Any criterion chosen should be a representative measure of the problem. In this instance, management has defined the problem as being one of tenure. Therefore, the criterion of job tenure appears to represent the problem.

	Necessary
Related to other Criteria	In this instance, it is undesirable for job tenure to be related to other criteria. If it was related, it would be difficult to determine if it was actually being predicted. Undesirable
Predictable	If a criterion appears unpredictable, it may be fruitless to attempt to predict it. In this instance, job tenure appears to be predictable. Necessary
Measurable	If a criterion cannot be measured, it is difficult to justify it as being appropriate. Job tenure can be easily measured. Necessary
Relevant	This is the most important characteristic to assess. If the criterion is not related to the problem, results will have no meaning. Job tenure appears quite relevant to the problem. Necessary
Uncontaminated and bias-free	If a criterion is biased, results obtained will be distorted, and have little meaning. While it is extremely difficult to obtain a completely unbiased criterion, it is something to strive for in any study. To be completely accurate, an unbiased criterion is Necessary.

If, in analyzing a chosen criterion, it is found that it may not be as "good" as desired, it is wise to search for one that could be possibly better.

IDENTIFYING CRITERION GROUPS

Choosing an appropriate criterion and identifying criterion groups are the most important steps in developing a WAB. If an inappropriate criterion is chosen and criterion groups are not identified properly, the whole intent of the study is not being met. An appropriate criterion coupled with properly identified groups leads to meaningful results.

Once an appropriate criterion is chosen, two groups of current employees are formed: a High-Criterion Group (Group I)-- representing desirable employees, and a Low-Criterion Group (Group II)--representing undesirable employees. In order to make best use of the data, both groups should be as large as possible, with a minimum of 75 employees per group. These groups are subdivided into a Weighting Group and a Holdout Group. Each Weighting Group should include 2/3 of the larger group, with the remainder going into Holdout Groups.

When all groups are formed, major questions need to be answered: 1) What is the distinction between short and long tenure?, and 2) How far back, chronologically, should we go to get data?

With regard to the first question, management has determined from the records that employees who worked at least one year tended to stay on for a long time. However, many employees left the company within 6 months. Therefore, long tenure will include employees who have worked for at least one year, and short tenure will include those who left within 6 months.

With regard to the second question, the problem encountered has only been a phenomenon of the past three years. Therefore, records of all employees hired in the last three years will be examined for the necessary data.

Employees with long tenure are desirable, and those with short tenure are considered undesirable. Such a clear distinction between desirable and undesirable employees is not always available. In many instances, a job analysis/performance appraisal study is needed to determine work behaviors and attributes of current employees. Once work behaviors and attributes are determined, personal factors that relate to those behaviors and attributes can be examined and ultimately measured.

SELECTING APPLICATION BLANK ITEMS TO BE ANALYZED

The type and number of items included in a WAB depend upon two considerations: the application blank itself and the legal ramifications of various items included. A WAB looks no different than an ordinary application form. A new application form is not needed because applicants do not know the application blank is weighted. "Legally," any item can be used, either from the application form or from other personnel records. However, if any items lead to adverse impact upon a protected class (race, religion, or national origin), a Bona Fide Occupational Qualification (BFOQ) may have to be demonstrated in order to use that particular item [7, Section 14, Paragraph a].

The number of items in initial stages of the weighting process should be as large as possible, because many items may not differentiate between desirable and undesirable employees. Items that do not differentiate are not included in the final WAB; they have no predictive value. Items that differentiate must be analyzed to determine whether they bear an actual relationship with the purpose of study. For example, could an individual's marital status influence his/her tenure on a particular job? Plausibly, marital status does influence job tenure because it might restrict an individual from moving from place to place. Thus, marital status might differentiate between desirable and undesirable employees.

Instructions: For purposes of this exercise, only 6 items are included (to keep the exercise from becoming too cumbersome). Look at the 6 items below and reason if they might differentiate between desirable and undesirable employees.

(1) Age; (2) Number of years previously employed; (3) Average tenure of former jobs; (4) Distance of residence from work place; (5) Marital status; and (6) Number of years of formal education.

SPECIFYING ITEM RESPONSE CATEGORIES

For each item used in the initial stages of development, data are divided into response categories. There are basically three methods:

1) Equal Frequency Classes--divides responses of combined (total) weighting groups into four or five classes with approximately an equal number per class.

2) Equal Interval Classes--divides the responses into equal intervals within a range of responses (e.g., for Age: 21-26, 27-32, etc.).

3) Maximum Weight Classes--trial and error approach to maximize differences of a particular response item. This method is least desirable because it may capitalize on chance differences within a particular item.

Some items can easily be divided into response categories by a natural division. For example, marital status can easily be divided into the response categories of single, married, divorced (including legally separated), and widowed. For purposes of the exercise, all items are divided into response categories using Equal Frequency classes, or by a natural division.

Instructions: 1) From data in Table 1[4] total responses in each category of "Age" for both High and Low Weighting Groups (use the worksheets provided).

2) Total both Columns 2 and 3.

3) Convert numbers in Response Categories into percentages; i.e., divide each Response Category in Column 2 by the total of Column 2. Place this number in Column 4. Do the same for Columns 3 and 5.

4) Subtract Column 5 from Column 4 for each Response Category.

5) Do this for remaining application blank items.

DETERMINING ITEM WEIGHTS

To determine whether desirable workers have different response patterns from undesirable workers, it is necessary to determine Net Weights and Assigned Weights. This is a straightforward process-- using the charts in Tables 2 and 3.

Instructions: To determine Net Weights, use Charts A & B in Table 2. Take the difference in percentages (Column 6), and locate that same percentage in Chart A or Chart B. Place the corresponding Net Weight in Column 7. If percentages are negative, use the same process, only treat the differences in percentages and Net Weights as negatives also.

To determine Assigned Weights, use Table 3. Locate the appropriate Net Weight in the table, and place the corresponding Assigned Weight in Column 8.

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[4] Tables and worksheets will be provided by authors upon request.

ASSIGNED WEIGHT VALUES

Compare your Assigned Weight values with those presented in Table 4. The values you computed should be the same. Net Weights are converted to Assigned Weights because many Net Weights turn out to be negative, and thus, there is difficulty in totaling each applicant's final score. Any item having the same Assigned Weight for each Response Category does not differentiate between desirable and undesirable, and should be discarded.

Of the six initial items used in the analysis, only four (Age, Average Tenure, Distance of Residence, and Number of Years Previously Employed) appear to differentiate desirable and undesirable employees. These are the items to use in the final WAB.

ANALYZING INDEPENDENT SAMPLES FOR CROSS-VALIDATION

With these items that differentiate the two Weighting Groups, it is necessary to "reaffirm" them by cross-validating the data in the Holdout Groups. Each Holdout Group consists of another sample of employees independent of the Weighting Groups. If cross-validation shows that a differentiation exists between desirable and undesirable employees, greater confidence can be placed in items selected for use in the final WAB.

The statistical analysis used in cross-validation must consider the dichotomy between desirable and undesirable employees. Therefore, the Point-Biserial Coefficient of Correlation should be calculated.[5] The formula is:

$$r_{pbi} = \frac{M_p - M_q}{\delta_t} \times \sqrt{pq}$$

where:

M_p = mean of values in the favored (desirable) category.

M_q = mean of values in the remaining (undesirable) category.

δ_t = standard deviation of the total sample.

p = proportion of cases in the favored (desirable) category, (i.e., number of cases in desirable category/total number of cases.

q = proportion of cases in the remaining (undesirable) category.

Instructions: Using data in Table 5, calculate r_{pbi} for each

Age: $\quad \frac{M_p - M_q}{\delta_t} \times \sqrt{pq} = \underline{\quad} \times \sqrt{\quad} = \quad = \quad r_{pbi}$

item selected in the final WAB.

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[5] For a good discussion of the Point-Biserial Coefficient of Correlation, see J. P. Guilford, Fundamental Statistics in Psychology and Education, (New York: McGraw-Hill, 1978), 6th ed.

Average Tenure: Age: $\quad \frac{M_p - M_q}{\delta_t} \times \sqrt{pq} = \underline{\quad} \times \sqrt{\quad} = \quad = \quad r_{pbi}$

Distance of Residence: Age: $\quad \frac{M_p - M_q}{\delta_t} \times \sqrt{pq} = \underline{\quad} \times \sqrt{\quad} = \quad = \quad r_{pbi}$

Number of Years Previously Employed: Age: $\quad \frac{M_p - M_q}{\delta_t} \times \sqrt{pq} = \underline{\quad} \times \sqrt{\quad} = \quad = \quad r_{pbi}$

The correlation coefficient r_{pbi} depends directly upon the differences between means M_p and M_q. If r_{pbi} is significant at a specified level of confidence, a difference between desirable and undesirable employees exists for that particular item. Therefore, cross-validation supports use of that item in the final WAB.

Instructions: From Table 6, determine whether r is significant at p .05 level of confidence. Then compare your results with those that follow. Note: If r_{pbi} is calculated as a negative, treat it as a positive number.

Item	r_{pbi}	Significant at p .05
Age	.6521	yes
Average Tenure	.5439	yes
Distance of Residence	.4234	yes
Number of Years Previously Employed	.5000	yes

Do the items clearly differentiate between desirable and undesirable employees? What confidence can you hold in the results?

SETTING WAB SCORES FOR SELECTION

The practicality of a WAB is that selection decisions can be enhanced by determining which applicants appear to be more desirable employees. It is difficult in practice, however, to set rigid cutting scores for selection. Rigid cutting scores constantly need to be validated [7, Section 5, Paragraph B], and fluctuations in supply and demand of potential applicants might influence the number of potentially desirable employees. One alternative is to develop a range of scores in which more desirable applicants appear at the top of the range, and the more undesirable appear at the bottom. Those appearing more desirable can be evaluated further to assess other qualifications.

EXTENSIONS AND APPLICATIONS

A WAB can be used as a screening device to rapidly identify potentially desirable applicants. It may be used with other tests and measures as a predictor of possible "success" on the job. The WAB provides a quick and inexpensive technique to process many applicants and determine which appear to be more desirable. Those applicants scoring high can be evaluated on other qualifications to assess their potential to the company.

As a predictor, it is very important that the WAB be valid. With an unvalidated WAB, meaningful predictions cannot be made. Also, a WAB may improve predictions made by other selection techniques, and thereby further enhancing the personnel functions. Thus, increased power is obtained for differentiating between high and low human resource performance.

CONCLUDING POINTS

What is the basic procedure for developing a WAB?

What are the most important steps in developing a WAB?

What needs to be considered in selecting items to be used in a WAB?

Can you think of any drawbacks that might limit the use of a WAB?

In what ways can the WAB be used?

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[6] Scott, Richard D. and Richard W. Johnson, "Use of Weighted Application Blank in Selecting Unskilled Employees," Journal of Applied Psychology, Vol. 51, No. 5, (Oct. 1967), pp. 393-395.

[7] Uniform Guidelines on Employee Selection Procedures, Equal Employment Opportunity Commission, 1978.