DOCUMENT RESUME

ED 217 349 CG 015 955

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TITLE Assessing Changes in Levels of Capacity and Performance across the Working Life-Span.
PUB DATE Nov 81
NOTE 13p.; Paper presented at the Joint Annual Meeting of the Scientific Gerontological Society (34th) and the Scientific & Educational Canadian Association on Gerontology (10th), (Toronto, Ontario, Canada, November 8-12, 1981).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Age Differences; Age Groups; Aging (Individuals); *Employment Qualifications; Expectancy Tables; *Job Performance; Models; *Personnel Evaluation; Prediction; *Predictive Measurement; *Work Life Expectancy

ABSTRACT

This document addresses the problems facing researchers who are involved in evaluating worker potential across the life-span, including that most evidence focusing on differential job ability levels within age classifications has come from empirical investigations concerning functional age. A critique of the functional age approach is presented along with comments that reflect the suggestions of several authors about the use of functional age strategies for employment decisions. Three general models which researchers can use for evaluating worker potential across the life-span are offered. Each model is reviewed briefly and comments are given. The first two models presented belong to the functional age approach, with a focus on normative age grouping and a performance analysis at specific ages, while the third model offers an alternative strategy, job analysis of attributes, abilities, and minimum performance, for assessing worker competency across the life-span. Model Three is discussed in greater detail and includes a list of eight steps to consider in all validation procedures where older workers are evaluated. A framework for older worker assessment based on this third model is also included. (NRB)

Assessing Changes in Levels of Capacity and Performance Across the Working Life-Span

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Current evidence found in the life-span literature suggests that older adults maintain high levels of cognitive functioning in many areas of performance. However, very few research projects have extended the findings on assessment of older adult performance to work settings. Thus, the purpose of this proposal is to assess the current emphasis on older adult evaluation in job relevant contexts.

For most occupations city, state, federal and/or private industry, testing is frequently a mandatory phase for selection and promotional decisions. The area of test fairness in employment decisions over the last ten years has come under numerous legal assaults involving both minority group members and females. While there have been at least fifty investigations focusing on selection of minority group members concerning test fairness and differential validity, only a few research projects have focused on discrimination against older workers (Arvey, 1979, Arvey & Mussio, 1973).

The issue of using chronological age, as a determinant of potential performance level receives frequent criticisms as additional evidence is provided for individual differences in performance levels within similar chronological age levels (Panek, Barrett, Sterns, & Alexander, 1977). Perhaps, the most obvious criticisms concerning the use of arbitrary age cut-offs in employment decisions has begun to evolve in the airline transportation industry. Recently a group from the Institute of Medicine of the National Academy of Science was convened to evaluate the efficacy of the age sixty rule for mandatory retirement. Based on their preliminary report, continuing pressure could be placed upon the FAA to re-evaluate their standards for mandatory retirement. The committee suggested a rigorous pursuit of alternative assessment procedures for evaluating worker performance across the life-span signalling a change in status for chronological age in airline employment decisions.

Life-span psychologists have come to a point where empirical evidence must be obtained on assessment procedures used with employees throughout the duration of their careers. Chapanis (1974) focused upon the existing evidence concluding that there was minimal effort directed towards the testing of performance indices and their validity for predicting older worker performance. Moreover, the majority of measures used to assess differential ability levels have been normed on younger samples. Thus, the battery of measures available to life-span psychologists must be evaluted for individuals across all ages to assess their validity for both younger and older job applicants.

The bulk of evidence focusing on differential job ability levels within age classifications has come from empirical investigations concerning functional age (e.g., Dirken, 1972; Heron & Chown, 1967; Furukawa, Inove, Kajiya, Inada, Takasug, Fukus, Takeda, & Abe, 1975; Webster & Logie, 1976). The impetus for this approach can be traced back to World War II and the statements of McFarland (1943), who suggested the importance of analyzing individual differences in functional capacity within age classifications. McFarland (1953, 1973) has repeatedly advocated the use of objective units of measurement to evaluate the degree, duration, and amount of effort necessary to perform in specific job roles while considering chronological age with much less importance. In essence, McFarland has argued for the generation of research which links specific levels of individual ability to the differing levels of task demands in the job environment.

Ironically, researchers' efforts in developing the functional age concept ignored the relationship between pertinent abilities and specific task demands (Costa & McCrae, 1977). Also, measures were chosen for analysis which clearly reflected declining functions with age (e.g., auditory pitch ceiling, reaction time, maximum systolic tension, visual capacity, and grip strength),

therefore contributing to a restriction in the range of measures considered applicable to assessing older worker potential. In general, performance indices have been selected considering their presumed relationship with chronological age rather than the more acceptable criterion of actual job performance.

Proponents of functional age analysis suggest that differences in functional capacities within an individual's developmental course and between age groups can be adequately estimated and used in the prediction of job performance status. However, performance status has not been the criterion chosen, rather functional age research projects have combined estimates of functional capacity into a regression framework to predict chronological age. Thus, regression equations are comprised of estimates of functional capacity which offer multiple r-values exceeding .80 with the criterion of chronological age, but little is provided warranting the validity of these measures for job performance.

There are some obvious criticisms which go beyond the aforementioned and further question the research strategies used in functional age paradigms. The comments presented reflect the suggestions of several authors critiquing the utilization of functional age strategies for employemnt decisions (Baltes, 1979; Costa & McCrae, 1977; Dempster, 1972; Schaie & Gribben, 1975).

A Critique of the Functional Age Approach

1. Functional age researchers have relied heavily upon a decremental model of developmental change resulting in a severe restriction in the range of functional indices evaluated.

2. Their choice of measurement strategies has failed to differentiate whether variations in performance are due to pure age effects or disease factors.

3. They have consistently argued for a single global index of performance contradicting empirical evidence which suggests a multidimensional aging process.

4. Several investigators have ignored the possibility that regression towards the mean in extreme age groups can dramatically affect the interpretation of one's findings.

5. Reliability estimates on functional capacity measures have not been presented. Therefore, we are unsure whether variations in performance are due to the unreliability of their instruments or the potential change in performance functions with increasing age.

6. Combining age related functional capacities to predict chronological age may be irrelevant to estimating potential job performance levels.

7. In choosing age related functional capacities researchers have confused the concepts of "coincidental" and "intrinsic" predictors. For example, greyness of hair may be related to physical strength, but it is certainly coincidental and should not be entered into the regression equation. Where this strategy was applied to employment contexts they have violated good professional practice, federal guidelines, and court decisions regarding age discrimination.

In summary, indices used for prediction must be validated on job performance criteria and should be intrinsic attributes of the individual. Using intrinsic attributes related to job performance one can set cut-off scores on each attribute that will determine the proportion who will reach an acceptable standard of performance.

In our estimation there are three general models researchers can rely upon for evaluating worker potential across the life-span. The first two have received a cursory review in discussing functional age approaches and

are analyzed again to further clarify existing problems. Model three offers an alternative strategy for assessing worker competancy across the life-span. The models and corresponding comments are briefly reviewed below:

Model 1

Attributes are measured at various chronological age levels with norms constructed for each age grouping. If group performance falls below a predetermined cut-off, all members at a specific age are eliminated from employment consideration (e.g., age 60 rule for airline pilots).

Comments:

1. There is no guarantee that the variables chosen for measurement are relevant for job performance.

2. Using normative data for prediction may have minimal utility. For example, an individual at the 40th percentile may not differ significantly on the performance criterion than an individual falling at the 60th percentile.

3. The attributes chosen for measurement may have differential meaning for different age cohorts.

4. The model assumes that development is characterized by decremental changes.

5. The implicit assumption is made that the measured attributes do not interact with other factors differentially across age groupings.

Model 2

Attributes are measured at various chronological age levels with specific cut-offs set for each attribute thus minimizing the influence of age group membership. If an individual's performance level exceeds the initial cut-off, they are selected regardless of their age. This approach represents the current philosophy of functional age research.

Comments:

1. All of the previous model 1 comments pertain to model 2, however, model 2 goes beyond model 1 in focusing upon differences in individual performance levels, with age receiving less importance. The major advantage of the functional age approach was the highlighting of individual differences within age levels not in the procedure followed.

Model 3

Attributes are measured which are relevant to the prediction of job performance. Abilities are conveyed using expected levels of job performance versus norms and/or rankings. Essentially, individual performance on the measured attributes must exceed a certain level which is necessary for acceptable job performance, but not sufficient.

Comments:

1. This approach suggests a rigorous pursuit of attributes which are measurable and relevant to specific job performance criteria. Ideally, attributes selected for measurement are intrinsically related to both the job and the aging process to allow for the tracking of individual performance levels over time.

To summarize, there are a number of steps to consider in all validation procedures where older workers are evaluated. These steps are outlined below:

1) Conduct a job analysis to identify relevant job components.
2) Identify those attributes relevant to each specific job component.
3) Specify those abilities relevant to job performance that vary with increasing age.

4) Design a validation project considering the potential variations in performance capacity for all attributes.

5) Obtain validity estimates for your predictor battery. Develop your predictor battery and criterion considering only the essential components of the job. Try to minimize irrelevant factors which may interact with the aging process and your estimate of validity.

6) Determine cut-off levels for your predictor battery while assessing the differential impact across age groups.

7) Design expectancy charts to convey the probability for successful performance given individual performance scores.

8) Continue to accumulate data to assess the efficacy of your selection strategy over an extended period of time. Also, the repeated evaluations will allow for the tracking of individual performance levels from one assessment period to the next period.

Typically, industrial psychologyists will analyze a job to determine its relevant components and subsequently develop measures for assessment.

Insert figure 1 about here

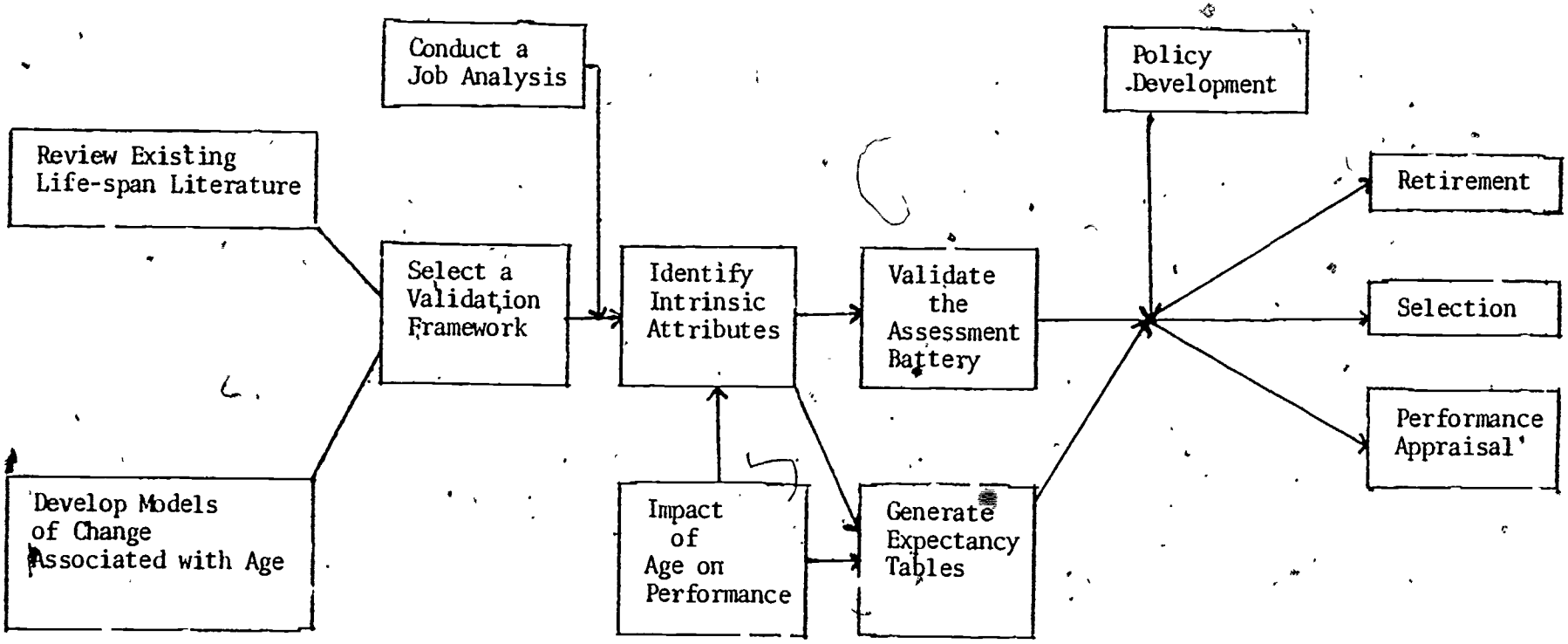
Figure 1 represents a general framework underlying the prediction of performance. In contrast to approaches one and two an emphasis is placed on predicting relevant performance on the job versus chronological age. The figure suggests a redefinition of terms in addition to concentrating on information gleaned from physiological and psychological research. Emphasis is placed upon the generation of new methods for predicting performance with a stronger reliance on information obtained from each specific job analysis. Perhaps the single most important component of the revised model is the generation of expectancy tables (see Lawshe & Bolda, 1958). Expectancy tables reflect test scores relative to the probability of success associated with specific performance on a criterion task. Using this analysis we can

establish criterion performance levels beyond which individuals could be expected to perform the job at a satisfactory level. With this approach companies and/or the courts could require an individual to be tested more frequently on those functions which are essential for job performance. With repeated assessments one can track an individual's performance level over time, to determine whether substantial drops in their expected probability of successful performance have occurred. The key to this approach is the transformation of correlation coefficients between predictor and criterion scores into probability estimates.

Attention must now be afforded to surveying existing measures to determine their validity and reliability for the older and younger segments of the workforce. Measures applicable to the younger segment of the population should in turn apply for older workers. Modifications in norms or test specifications for older workers, if necessary, may not affect the validity nor reliability of one's findings.

Figure 1

A Framework for Older Worker Assessment



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