

## **Relationships between diversity of interests, age, job satisfaction and job performance**

RICHARD D. ARVEY and H. DUDLEY DEWHIRST

*Department of Industrial and Personnel Management, The University of Tennessee*

The relationships between age and diversity of interests in general, and in job-specific occupational areas on the one hand, and salary treatment (as a measure of performance) and intrinsic and extrinsic job satisfaction on the other hand, were investigated for 291 scientists and engineers. Results for young and old but not intermediate-age subjects indicated that high diversity of interests in general occupational areas, as measured by the Strong Vocational Interest Blank, was related to a salary-based measure of performance. Diversity of interests in general and in job-specific occupational areas was linearly and positively related to intrinsic satisfaction. Age demonstrated a significant positive relationship to extrinsic satisfaction.

Do individuals, who have wide diversity of interests in a variety of occupational and non-occupational activities, display more or less satisfaction in their jobs or perform at different levels? Pelz & Andrews (1966) have suggested one model concerning what occurs in job settings with individuals who have wide interest patterns. Their work suggests that individuals with diverse interests are apt to be more effective in their jobs than individuals with fewer interests. Pelz & Andrews found that scientists and engineers who had several areas of specialization tended to exhibit higher performance levels than those who were relatively narrow in the number of specialization areas. Moreover, their data suggested that diversity interacted with age. Diversity did not differentiate among relatively effective and ineffective older scientists, but 'lack of breadth was a marked drawback for the younger man . . .' (1966, p. 74). The study by Pelz & Andrews may be somewhat limited due to two factors. First, the sample was drawn from a highly professional and educated group in scientific and technical occupations and, secondly, they defined diversity somewhat narrowly as the number of areas or sub-areas within a discipline in which their subjects had an interest.

A study by Dunnette & Kirchner (1958) lends some confirmation to the Pelz & Andrews model while perhaps overcoming the limitations noted above. They reported that sales managers who displayed a relatively 'broad' interest pattern (as defined by Strong Vocational Interest Blank profiles) were significantly more effective in their jobs than managers who displayed a more 'narrow' interest pattern. Thus, this study dealt with a less educated sample and used a broader definition of interest diversity.

Both the Pelz & Andrews and the Dunnette & Kirchner studies dealt with the relationship between interest diversity and performance. One objective of the present study is to examine the relationship between interest diversity and both satisfaction and performance. While it is clear that satisfaction and performance are separate variables (Brayfield & Crockett, 1955; Vroom, 1964), we might assume that a similar relationship holds between interest diversity and satisfaction. That is, high diversity

of interests should be related to relatively high satisfaction levels and, particularly, to satisfaction with the intrinsic aspects of the work.

The present study tests both general interest diversity and interest diversity in job-specific areas as possible determinants of performance and satisfaction. The Dunnette & Kirchner research suggests that general diversity of interest is related to high performance, while Pelz & Andrews indicate that something akin to job-specific interest diversity is related to performance. While our measures of diversity are different from both previous studies and our population is different from Dunnette & Kirchner's sales managers, there is a basis for the hypothesis that performance is related to both general and job-specific diversity of interest.

The second purpose of the present investigation is to explore the possible interaction of age and diversity of interest on performance and satisfaction. It is hypothesized that diversity of interest is associated less strongly with performance and satisfaction as age increases. This hypothesis is based on Pelz & Andrews' finding that greater diversity was associated with higher levels of performance among younger employees but not among older employees.

#### METHOD

##### *Sample*

The present research was part of a larger study conducted among scientists and engineers employed at a large multidisciplinary nuclear research and development centre. All technical professionals in four of 18 divisions with more than 6 months' service were asked to participate in the study. Of 383 such individuals, 302 (79 per cent) responded to the request. However, missing data reduced the sample to 291. The mean age of these subjects was 46.5 years; the average tenure level was 18.5 years. Requirements for the PhD degree had been completed by 106 subjects, and 185 had masters' degrees and/or undergraduate degrees.

##### *Diversity of interests*

Subjects completed the Strong Vocational Interest Blank (Campbell, 1971). A score between 40 and 45 in a particular occupational area indicates high interest similarity to individuals in that area, and a score over 45 signifies very high interest similarity (Campbell, 1971). There are 54 occupations for which the SVIB provides interest scores. For a broad occupational group (such as scientists and engineers in this instance) the 54 occupations can be classified as general (not specifically related to the job) and specific (interests which appear specifically related to the type of tasks in which scientists and engineers engage). Two diversity scores were computed for each subject based on the above classification. The general interest diversity was based on the 45 occupational areas which were obviously not related to scientific and engineering tasks (e.g. musical performer, sales manager, etc.). This score was computed by summing the number of occupations in the general area for which the subject scored 40 or above. The mean of this general interest diversity score was 6.8 (SD = 3.0) and the range was 0 to 15.

A second score was derived by summing the number of interest scores above 40 in nine occupational areas specifically related to science and engineering tasks (e.g. physicist, chemist, engineer, etc.). The classification of the various occupations into general and job-specific interest areas was performed on an a priori basis by the authors. Agreement between independent judgements of the authors occurred for

all but four of the occupational areas. These four were first classified as semi-related; however, preliminary analyses indicated little, if any, differences between this classification and the specific classifications. Therefore, these two classifications were combined. Thus, the specific occupational area includes occupations like maths-science teacher and computer programmer. The mean on this specific interest diversity score was 3.8 (SD=2.1) with a range from 0 to 9.

Subjects were classified into high, middle and low diversity of interest groups for both the general and the specific diversity scores by splitting the sample into approximate thirds for each variable. It was decided not to use the diversity score generated and recorded on the SVIB profiles (Campbell, 1971) for two reasons. First, the study concerned whether different relationships would be obtained depending on the type of diversity of interests measure used (general or specific). The diversity score indicated on the SVIB profiles does not make this distinction. Secondly, this index may not have been as strong an indicator of diverse interests as the derived score. That is, it seemed that occupational scores over 40 may have reflected an intensity dimension possibly not picked up by the diversity index of the SVIB.

### *Performance*

Supervisory ratings of job performance were not available. Instead, salary data were used to develop a measure of performance. It can be argued that salary is a major way in which an organization rewards effective performance by its members. However, it is recognized that factors other than performance (e.g. cooperativeness, sociability) may also influence salary treatment. Thus salary is, at best, an imperfect measure of performance.

Salary levels are also influenced by age, length of service and educational attainment, and may be affected by differences in salary treatment within different divisions of the organization. To control for these differences, the salary data were subjected to a multiple regression analysis to determine an expected salary for each subject based on age, tenure, education and division affiliation. The multiple correlation coefficient obtained when predicting current salary using age, tenure, education and division as independent variables was 0.65. Each subject's expected salary was subtracted from his actual salary to obtain a salary difference figure which was used as a measure of performance. Thus, a positive value on this index indicated that the individual was paid above that which would be predicted on the basis of age, education, etc. For one division of the four included in the sample, it was possible to determine the correlation of the salary difference figure with the most recent performance ratings by supervisors. The correlation ( $r=0.5$ ) indicated that the performance measure derived from salary data was significantly related to recent performance, although other factors, such as those discussed above, did influence salary and thereby weakened the quality of the salary-based measure of performance.

### *Satisfaction*

The Minnesota Satisfaction Questionnaire was utilized to gather satisfaction data. This instrument presents 21 statements (e.g. 'the freedom to use my own judgment') and elicits responses to these statements on a five-point scale (5=very satisfied, 1=very dissatisfied). A number of statements describe intrinsic aspects of a job, that is, aspects which relate to a person's feeling about the job itself (e.g. the feeling of accomplishment) in contrast to those features in jobs associated with

or directly administered by supervisors (e.g. pay) or organization conditions (Mitchell, 1974). These latter features are considered extrinsic satisfaction items. Two scores reflecting these two types of satisfaction item were derived by adding the scores for the respective items within each category. Eight satisfaction items were considered clearly intrinsic; the remaining 13 were scored as extrinsic items.

#### *Procedure*

Three age groups were formed in which subjects aged 50 and over ( $n=130$ ) were classified as a high age group. Subjects between the ages of 35 and 50 were considered as a middle age group ( $n=140$ ), and subjects less than 35 years of age ( $n=21$ ) were classified as a young age group. The procedure consisted of performing several analyses of variance, using the two diversity of interests scores and age as independent variables, and salary, intrinsic satisfaction and extrinsic satisfaction as dependent variables. Because the linear effects of age had been partialled out of the salary variable, a significant age main effect (which is possible if age was related to salary in a non-linear fashion) was not expected. Instead an interactive effect with this variable was predicted.

#### RESULTS

The results of the ANOVA using the salary-based performance measure as the dependent variable and the general diversity of interests (GDI) measure as the independent variable are shown in Table 1.

Table 1. *Summary of ANOVA using age and general diversity of interests as independent variables, and performance as the dependent variable*

Source	d.f.	MS	F	P
Age	2	83 966	1.22	0.29
General diversity of interests (GDI)	2	190 274	2.77	0.06
Age $\times$ GDI	4	241 706	3.52	0.008
Subjects (age $\times$ GDI)	282	68 674		

These data indicate a significant interaction between age and GDI and an almost significant ( $\leq 0.06$ ) main effect for GDI. The means for the various cells are plotted in Fig. 1. The figure indicates that high performance is associated with high GDI among the younger and older age groups. *Post facto* comparisons between the high GDI and the middle and low GDI groups within the high age group using the Duncan procedure (Winer, 1971) were significantly different. Similar findings occurred comparing the high GDI versus the middle and low GDI groups within the younger age group.

Table 2 presents the results of the ANOVAs using the intrinsic and extrinsic satisfaction scores as dependent variables and again using the general diversity of interest measure as the independent variable. These data revealed that age had a significant main effect with extrinsic satisfaction where the high, middle and low age groups displayed mean values of 48.5, 46.2 and 45.6, respectively. General diversity of interests had a significant main effect with intrinsic satisfaction. High

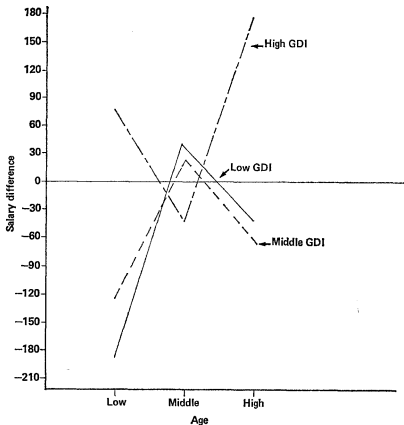


Fig 1. Salary difference as a function of age and general diversity of interests (GDI).

Table 2. Summary of ANOVAs using age and general diversity of interests as independent variables, and intrinsic and extrinsic satisfaction scores as dependent variables

Source	Intrinsic satisfaction				Extrinsic satisfaction		
	d.f.	MS	F	P	MS	F	P
Age	2	26.9	1.16	0.31	156.4	3.20	0.04
General diversity of interests (GDI)	2	124.3	5.37	0.001	50.2	1.02	0.36
Age $\times$ GDI	4	46.6	2.01	0.09	66.7	0.63	0.64
Subjects (age $\times$ GDI)	282	23.1			48.8		

GDI subjects displayed the highest level of satisfaction with intrinsic aspects of their jobs, ( $\bar{X}=32.9$ ) compared to the middle ( $\bar{X}=31.5$ ) and low ( $\bar{X}=31.5$ ) GDI subjects. No interactions were detected between GDI and age with the satisfaction measures as dependent variables.

When the specific diversity of interests (SDI) measure was used as the independent variable and the ANOVAs performed, results indicated (i) salary difference was not significantly associated with SDI, age, nor any of the interactions, and (ii) the intrinsic

and extrinsic satisfaction variables displayed similar relationships to age and specific DI measures as noted previously. That is, SDI was positively associated with intrinsic satisfaction and age was positively associated with extrinsic satisfaction.

#### DISCUSSION

These data suggest that individuals with high general interest diversity tend (i) to perform better as measured by salary and (ii) to display more satisfaction with the intrinsic aspects of their jobs. While a significant interaction between general interest diversity and age occurred using the salary-based performance measure, the data were generally supportive of the hypothesis based upon Pelz & Andrews (1966). Younger, more diverse individuals displayed significantly higher salary levels than did less diverse younger subjects. This finding is clearly in line with the prediction based on the Pelz & Andrews study, although they dealt primarily with diversification of specific interests. Because the sample sizes for the three cells for the young age group were small ( $n=10, 7$  and  $4$ ) these data must still be viewed as tentative. A finding which was not congruent with the specific hypothesized interaction occurred in that the same effect was observed for the older subjects. High diversity older subjects displayed higher salary difference values than did low and middle diversity older subjects.

Diversity of specific interests failed to demonstrate any main or interactive effects with the salary difference variance. Perhaps one reason for the failure of SDI to show significance was its more limited variance.

The results showing that both general and specific diversity of interest were positively related to intrinsic satisfaction also support the line of thinking developed from the Pelz & Andrews (1966) study. High diversity subjects, regardless of age, tended to find more satisfaction with the intrinsic aspects of their jobs than did less diverse subjects. Perhaps these individuals were more responsive to the stimulus conditions in their jobs. Highly diverse individuals may be apt to perceive their job situations as more satisfying compared to less diverse individuals in similar job conditions. Tornow (1971) has made a similar distinction between individuals who view certain job elements (e.g. challenge, responsibility) as something they get out of a job, in comparison with individuals who perceive the same elements as representing demands on their time and effort.

However, a point of discussion concerns the issue that differences among jobs may have influenced some of the relationships observed. That is, it may be possible that individuals who exhibited high intrinsic satisfaction levels may also have more interesting (or enriched) jobs, either through self-selection of more interesting tasks or through assignment. Thus, we cannot be positive that high and low diversity of interest subjects in our sample were working on similar jobs. Future research efforts investigating this issue may attempt to obtain some measure of the particular job characteristics, e.g. perhaps using the Position Analysis Questionnaire (McCormick *et al.*, 1972).

The finding that age demonstrated a significant relationship with extrinsic satisfaction, and not with intrinsic satisfaction, has been noticed previously. Saleh (1964) suggested that older employees turn toward extrinsic factors as sources of satisfaction because they no longer have access to intrinsic factors. Another explanation, he suggests, is that due to coming retirement, older individuals may need to be more cognizant of extrinsic factors such as benefit packages and insurance programmes.

One problem which should be noted concerning the present research involves the meaning and measurement of diversity of interests. The various diversity measures derived in the present study did not correlate significantly with each other nor with the diversity score computed and printed on the actual SVIB profile. Furthermore, it is not entirely clear to what extent the number of high scores in various occupational areas represents real diversity of interests due to (i) the inter-relatedness of the scales, and (ii) the fact that occupational scores reflect item context from a number of areas (school interests, like and dislike of occupation) in addition to activity interests. An alternative measure of diversity of interests might be to employ only those items which describe activities. In any case, future research should tie down in a more precise way the conceptual and operational problems encountered when dealing with this variable.

Several other limitations to this study should be noted. The use of a salary variable to indicate performance has its obvious shortcomings. Replication of the research should be undertaken with more valid job performance criteria. Finally, the subject population with which the study dealt was selectively narrow. These subjects were scientists and engineers for whom technical change and progress are natural components of their work. It could well be that rapid technological changes make high diversity of interests an asset. This may not be true for other occupational fields which require less diversification and experience less change. Thus, more research is needed concerning the generalization of these results.

#### ACKNOWLEDGEMENTS

The funds for this research were made available through the National Science Foundation Research Management Improvement Program, Grant NM 44352.

#### REFERENCES

- BRAYFIELD, A. & CROCKETT, W. (1955). Employee attitudes and employee performance. *Psychological Bulletin*, **52**, 396-424.
- CAMPBELL, D. P. (1971). *Handbook for the Strong Vocational Interest Blank*. Stanford, Calif.: Stanford University Press.
- DUNNETTE, M. D. & KIRCHNER, W. K. (1958). Validation of psychological tests in industry. *Personnel Administration*, **21**, 20-27.
- MCCORMICK, E. J., JENNERET, P. J. & MECHAM, R. C. (1972). A study of job characteristics and job dimensions as based on the Position Analysis Questionnaire (PAQ). *Journal of Applied Psychology*, **56**, 347-368.
- MITCHELL, T. R. (1974). Expectancy models of job satisfaction, occupational preference and effort: a theoretical, methodological, and empirical appraisal. *Psychological Bulletin*, **81**, 1053-1078.
- PELZ, D. C. & ANDREWS, F. M. (1966). *Scientists in Organization*. New York: Wiley.
- SALEH, S. D. (1964). A study of attitude changes in the preretirement period. *Journal of Applied Psychology*, **48**, 310-312.
- TORNOW, W. W. (1971). The development and application of an input-outcome moderator test on the perception and reduction of inequity. *Organizational Behavior and Human Performance*, **6**, 614-638.
- VROOM, V. (1964). *Work and Motivation*. New York: Wiley.
- WINER, B. J. (1971). *Statistical Principles in Experimental Design*. New York: McGraw-Hill.

Received 28 October 1975; revised version received 26 July 1976

417 Stokely Management Center  
The University of Tennessee  
Knoxville  
Tennessee 37916  
USA

Copyright of Journal of Occupational Psychology is the property of British Psychological Society and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.