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A validation study for the position of bank teller utilizing the job matching system

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A VALIDATION STUDY FOR THE POSITION OF BANK TELLER UTILIZING THE JOB MATCHING SYSTEM

BY

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Preface

The author would like to express his sincere gratitude to all those whose contributions made this study possible. In particular, many thanks are due Dr. Robert J. Filer who provided the initiative for this study and continually provided guidance when it was most necessary. The assistance of Dr. Kenneth A. Blick and his continued availability and sense of humor were invaluable. Many thanks also to Dr. Warren P. Hopkins whose assistance in reading the manuscript and suggesting improvements was quite beneficial.

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Finally, a very heartfelt thanks is due my wife, Jennifer, to whom this paper is dedicated. Her support and inspiration have been unparallelled, just as she is.

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Abstract

This study attempted to validate the Job Matching System utilizing both objective and subjective proficiency measures. The participants were tellers from two area banks. It was found that the Match Index scores (r) that were obtained from the administration of the Life Activities Inventory could be used to predict success on the job (with success defined as above or below average proficiency levels) whether objective or subjective proficiency measures were utilized. In most comparisons it was shown that the Job Matching System, with certain notations, did not show adverse impact for any of the minority groups included in this study. Certain limitations upon the results of this study are discussed in the paper as well as recommendations for future studies utilizing the Job Matching System.

A Validation Study for the Position of Bank Teller Utilizing the Job Matching System

The use of measurements of individual differences in order to group individuals, or to select among them for some purpose, appears to date back much further than Galton's or Cattell's endeavors before the turn of the last century. In fact, the earliest accounts of what we might label "testing" by today's standards may go as far back as Gideon and Plato (Guion, 1976). However, early use of such measures was not systematic, or necessarily even evaluated for its effectiveness. The process of validating testing procedures and the importance of such validation has now been established for a great number of years, the earliest documented example being a three-part journal article by Freyd (1923). The Freyd articles provided such thorough and exhaustive guidelines in the principles and practices for employee selection that they are considered to be most exceptional even by contemporary standards. It is emphasized in the Freyd articles that tests should be empirically evaluated and that these validation studies should be as situation-specific as possible. These concepts are also emphasized by other researchers (Dunnette, 1976; Kornhauser & Kingsbury, 1924; Link, 1924; Thorndike, 1949).

Evidence has been accruing, however, that these concepts have not always been adhered to and that employee selection procedures have often been discriminatory towards certain groups of people, haphazard in application, and sometimes inefficiently used at best (Guion, 1976). Over the last decade, the Federal government has become increasingly aware of such problems, and legislation concerning selection procedures has been established. The most notable pieces of legislation are Title VII of the Civil Rights Act of 1964 and the Equal Employment Opportunity Commission's (EEOC) Uniform Guidelines on Employee Selection Procedures, the first version compiled in 1966 and the most recent version published in August, 1978 (Lazer, 1976). Title VII of the Civil Rights Act of 1964 states:

> Notwithstanding any other provision of this title, it shall not be an unlawful practice for an employer . . . to give and to act upon the results of any professionally developed ability test provided that such test, its administration or action upon the results is not designed, intended, or used to discriminate because of race, color, religion, sex, or national origin. (Guion, 1976, p. 784)

From this foundation the current EEOC Guidelines provide a "reiteration of orthodoxy" (Guion, 1976, p. 785) in employee selection procedures and are quite similar to the original Freyd work. Additionally, however, the Guidelines define as "tests" several things not normally referred to as tests and that these tests not only be validated for the whole applicant population but also for certain minority and non-minority subgroups (Guion, 1976).

Several landmark decisions from the U. S. Supreme Court have been quite influential in the renewed emphasis being placed on employee selection procedures. One notable case was Griggs v. Duke Power (1971) which established the tenet that the measures utilized in the selection of employees should show job relatedness (Guion, 1976). Quite often an organization utilizing a selection measure assumes job relatedness of the measure through information in the accompanying manual. This may appear to the organization to be a feasible approach since approximately 70% of all jobs in this country require less than six months of job specific training and another 50% require less than two months training in order to gain standard job performance of the personnel (Cleff, 1977). The organization may also assume feasibility to such an approach since many of the jobs in these two categories utilize the same job title (Cleff, 1977). But having the same title

does not insure having exactly the same job or the same responsibilities (Cleff, 1971). It has also been shown (Cleff, 1971) that these low- or non-skilled and semi-skilled workers have very low job satisfaction and a high turnover rate which, in many instances, may be partially due to their scanty prior knowledge of the job due to misleading job titles. In some of these types of jobs it is not unusual to have an annual ratio of 3.5 and 5.0 hires per job (Cleff, 1971) and turnover rates in the first year of employment ranging from 22% to 63% (Thigpen, 1976). It appears that little or no attention has been given to the work-content preferences of these laborers at these levels. In order to consider their preferences it would be necessary to match the job applicants to a job profile on certain dimensions of that job. The Job Matching System published by Samuel H. Cleff (1977) attempts to make that match in accordance with the many laws and guidelines for such a measure.

Early studies of profile matching, such as the Minnesota Studies (Dvorak, 1935), proved to be only partially successful. The profile matching used in those studies was based upon a series of tests and the matching of the test scores to the mean score on each test. One recent study utilizing a job matching system (Ash, Levine & Edgell, 1979) has shown that ethnicity does not appear

to be associated with the work condition preferences of the subjects. Another study (Sheibar, 1979), utilizing a "Jobmatch" system, has proven to be quite useful as a selection tool. If validity can continue to be shown for job matching systems for all groups of people, then many of the adverse impacts of the present and past generations of pencil-and-paper type instruments may be overcome. Additional benefits of job matching may also be recognized. A basic premise of the Job Matching System is that people tend to seek out those activities in which they feel that they are most likely to be successful and avoid those in which they feel less likely to be successful (Cleff, 1971). We can apply this premise to a work environment by defining success as the ability to maintain a job and maximize the probability of survival by exchanging time for money. Thus, "success" may also lead to some measure of self-satisfaction (Barad, 1977; Cleff, 1977). Another premise of the Job Matching System is that the occupationally well-adjusted person likes what he does, attempts to do a better job than a less well-adjusted person and stays on the job longer (Cleff, 1971).

The Job Matching System develops a type of job analysis, which is called a "job profile", that is generated by the supervisors of a particular job. Then the job profile is "matched" to an individual person's profile

which is derived from the person's work preferences and work experiences (Cleff, 1977). Cleff (1977) and others (Fulkerson & Barry, 1961; Mischel, 1968; Wernimont & Campbell, 1968) hypothesized that patterns of an individual's past and present behavior preferences can be reliable predictors of future patterns of behavior. The Job Matching System was developed on this premise and based on interviews utilizing a technique similar to the critical incident technique (Flanagan, 1954). Interviews with chronically unemployed black and white males and females produced 3600 "behavioral units". These behavioral units were independently categorized by Cleff and his associates into three groups: Things, People, and Ideas. Subgroups were defined and each of the main groups were retitled as follows: "Things" to "Concrete Orientation" with six subgroups, "People" to "Social Orientation" with five subgroups, and "Ideas" to "Information Orientation" with five subgroups. These 16 subgroups, broken down into three main groups, were referred to by Cleff as the "16 Dimensions of Work" (see Appendix A). A Factor Analysis and a Cluster Analysis of the 16 "Dimensions of Work" showed the Dimensions to be statistically independent of one another (Cleff, 1977, 1978). These Dimensions were hypothesized to be general enough to be definable in virtually any job of a low- or semi-skilled

nature. The task of the Job Matching System then is to match a job profile to an applicant's profile (based on preferences and experiences) which yields the Match Index (r). The Job Matching System exists, however, as an instrument of unproven effectiveness since no validation studies have been done other than those conducted by Cleff himself. In those studies by Cleff (1977), 200 subjects produced a positive correlation between the workers's self-reported experiences and preferences (referred to as the "Combined Person Profile") and the supervisors' Job Profile. In an article in which these studies were reviewed, Dunnette (1979) stated that the Job Matching System appears to offer promise as a selection instrument, but studies conducted by other investigators should be performed in order to validate Cleff's results.

The purpose of this study will be to further explore the relationships that exist between measures of competency and the Match Index that comes from the Job Matching System. Two populations of tellers from two large area banks (designated as "Bank A" and "Bank B") will be utilized as subjects in the study. Each population will be compared to job profiles unique to that bank (showing job relatedness), and both bank population's competency measures will be unique to that population. It is

hypothesized that there will be a significant difference in the mean Match Index scores for those tellers rated above the mean as compared to those rated at or below the mean competence level for each bank population on each of the several competence measures regardless of whether "objective" or "subjective" measures of competence are utilized. In effect, this will mean that those who obtain higher Match Index scores should also have higher competency scores. Secondly, it is hypothesized that there will be no significant difference in mean Match Index scores when the groups of tellers are divided into males vs. females, Blacks vs. Whites, Black females vs. White females, Black males vs. White males. These comparisons will attempt to show that the Job Matching System does not discriminate against any subgroups as defined by sex and/or race. Thirdly, it is hypothesized that there will be a significant difference in mean Occupational Adjustment Index scores (another $\underline{r}$ calculated between the preferences and the experiences scores for each individual) for those who have been on the job for a short time span as compared to those who have been on the job for a longer time span. It is expected that the higher the Occupational Adjustment Index, the lower the chance of turnover. Finally, it is hypothesized that there will be no significant difference in the mean Match Index scores for part-time employees as compared to full-time employees.

Experiment 1

Method

Subjects. The participants were 56 females with at least six months experience in the position of teller for an area bank (Bank A). Approximately 32% of the tellers were Black and 68% were White, 77% were full-time tellers and 23% were part-time tellers. Bank A did not require their tellers to participate, but rather asked for their voluntary participation. This exercise was incorporated into previously scheduled teller training and development classes for those who elected to participate. The participants were informed that this exercise would have no impact on their status as a teller with Bank A and that no individual results would be identified or forwarded to their branch manager or to the Personnel Office of their bank. Each teller was issued a code number which was the only identifier for that teller. There were originally 59 tellers tested, but the results from three of those tellers could not be used since they did not complete the Life Activities Inventory properly.

For this study the tellers were coded by the branch location at which they worked and also by their "regional" branch location. The four regions of Bank A were determined by the bank based on factors such as total business volume and cash flow. Table 1 breaks down the number of tellers of Bank A by location and region.

Table 1

Tellers from Bank A by Location, Mean Match Index Scores and Standard Deviations by Region

Regions (based on business volume and cash flow	Bank Code Number	Number of Tellers	Total Number of Tellers/Region	Mean Match Index Scores/Region	Standard Deviation/ Region
Region A (Lowest)	12	2	4	61.75	26.46
	14	2			
	3	0			
Region B (Low Middle)	5	2	8	39.75	21.88
	6	1			
	11	3			
	15	1			
	18	1			
	8	0			
Region C (High Middle)	2	2	18	46.47	23.095
	7	4			
	9	2			
	10	2			
	13	4			
	17	2			
	19	2			
Region D (Highest)	1	10	26	46.12	28.62
	4	9			
	16	7			

Note. N = 56.

Procedure. Each teller was given a consent form (see Appendix B) which was to be read and signed by the teller before the exercise commenced. Each participant received a code number and was verbally assured that the only master list of teller names and code numbers would be in the possession of the experimenter. It was emphasized to the tellers in the consent form that Bank A was not interested in individual results, but rather in the overall, group results. A representative from the Personnel Department of the bank then reiterated these and several other aspects of the consent form and related to the tellers the bank's purpose for participating in this study. Any questions that the participants had were then answered.

Each participating teller was administered a "Life Activities Inventory" (Cleff, 1974) self-report inventory (see Appendix C). The participants were asked to read the instructions silently as they were read aloud to them by the experimenter. The participants were then once again allowed to ask questions. The tellers were allowed to work on the Life Activities Inventory at their own pace with no time limit. The experimenter remained with the tellers during the exercise to insure that the inventory was properly completed.

This procedure was followed for each group to which the Life Activities Inventory was administered; this included administrations at four different locations, all of which provided quiet, well-equipped testing rooms. The number of participants at each administration varied between two and twelve.

The Life Activities Inventory was divided into two sections, the "Activities Liked and Disliked" section (Preferences), and the "Activities Done and Not Done" section (Experiences). In the Preferences Section of the Life Activities Inventory, the participants were given on each of the ten pages, 16 phrases from which they were to decide which two that they would like to do the most, which two they would like to do the least, and then which three that they would like the most and the three they would like the least. It was required that the phrases be chosen in the aforementioned order and once a phrase was chosen it could not be chosen again. This forced-choice method of responding served to reduce the number of choices by one each time a phrase is chosen. The Experiences Section utilizes the same rules for selection except that the emphasis is upon the selection of phrases that express activities that they have done in the past (two activities done the most often, two activities done the least often, and so forth).

Hand scoring of the Life Activities Inventory for each teller yielded a "score" for each of the 16 Dimensions of Work for each of the sections ranging from -30 to +30. The Preferences Section scores and the Experiences Section scores were then combined into a Combined Person Profile by adding each score from each of the 16 Dimensions of the Preferences Section to the corresponding score on the Experiences Section and dividing each sum by two.

A FORTRAN computer program developed by the experimenter was then utilized to derive further statistical information. A program written for Cleff was originally to be utilized for this purpose; however, unresolvable problems concerning the version of FORTRAN utilized in Cleff's program made it necessary to rewrite the entire program. For that reason, the output of the program utilized in this study does not include the "difference index", a statistic used by Cleff but not necessary to this study. The following data for each teller was generated by the program that was utilized: bank/identification number, location number, sex (by code number), time on the job (in Months), and status as either a part-time or full-time teller. The program also generated a printout of each teller's Preferences Scores and Experiences Scores for each of the 16 Dimensions, their Combined Person

Profile as well as the job profile for Bank A. Two Pearson product-moment correlation coefficients (r) were calculated by the program and were designated as the "Match Index" and the "Occupational Adjustment Index". The Match Index was a correlation between the job profile of Bank A to each teller's Combined Person Profile and the Occupational Adjustment Index was a correlation between the Preferences Scores and the Experiences Scores for each teller.

The supervisor of the Personnel Department of Bank A was requested to provide a list of six teller supervisors and/or teller trainers. These six supervisors/trainers were selected from each of the four regions of the bank and two from the Personnel Department. Each supervisor/trainer was provided a Job Behavior Summary (see Appendix D) and a Job Card Sort (see Appendix E) with additional written instructions for the completion of this booklet. The author of this study personally delivered the Job Behavior Summary and the Job Card Sort to each supervisor/trainer and emphasized the importance of properly completing the booklet. Emphasis was also made as to the importance of their participation and its subsequent bearing on the outcome of this study. The supervisors/trainers were asked to complete the Job Behavior Summary in a manner similar to that for completion of the Life

Activities Inventory. Their task, however, was to select which of the phrases in each group of 16 most resembled or least resembled the behaviors required by the job of teller in Bank A in order to do the job in the best manner possible. A forced choice selection was utilized whereby out of each group of 16 phrases the supervisor/trainer was required to chose the two phrases most like the job of teller, the two phrases least like the job of teller, and so forth. The Job Card Sort was included as the last section of the Job Behavior Summary, and was a listing of 16 general behaviors which the supervisor/trainer was instructed to rank-order as to their importance for a teller at Bank A. The top five behaviors were assigned rank values of "+5" to "+1" respectively (#1=+5, #2=+4, and so forth) and the last five behaviors were to be assigned rank values of "-1" to "-5" respectively (#11=-1, #12=-2, and so forth). The remaining behaviors were assigned a value of zero. These assigned values were then added to the appropriate 16 behaviors calculated from the Job Behavior Summary to yield the completed job profile for that supervisor/trainer. The scores for each of the 16 Dimensions for the job profile could range from -25 to +25.

After all six supervisors/trainers had completed their job profiles, the profiles were combined by

calculating the mean value for each of the 16 Dimensions and developing an overall job profile for Bank A for the job of teller. These job profiles were all hand scored.

Bank A was then requested to provide for each of the tested tellers, performance measurement figures for their on-the-job proficiency in each of the following categories for the period of January, 1978 to December, 1978: a) average number of transactions handled per month b) frequency of differences per 1,000 transactions c) net differences d) number of "other loss" items for which responsible e) other losses ($) for which responsible. These proficiency measurements were considered to be "objective" measures of performance and were expressed as numeric values. Bank A also provided values for the same five categories for the same time period for each of its branches and the total number of tellers that worked at each branch. Utilizing these figures it was possible to calculate for each of the five categories a mean proficiency value per teller at each location. It was necessary to compute this mean value per teller for each branch for each of the five categories, since the branches varied in the amount of transactions performed and/or in the amount of cash flow. Each teller's proficiency value for each of the five categories as provided by Bank A was then compared to the mean value per teller for the branch that

they worked. Each teller was then designated as either "above average" or "below average" for each of the five categories. This procedure was utilized on four of the measures of proficiency. For the category "number of other loss items for which responsible", all of the 56 tellers' values, regardless of what branch they worked at, were tallied, and a mean value was calculated. Each teller was compared to this figure and designated as "above" or "below average".

Results

In order to determine if there was a relationship and what that relationship was between the Match Index and the objective performance ratings, a multiple regression analysis (with stepwise inclusion) was computed utilizing the Statistical Package for the Social Sciences (SPSS). The variables included in the analysis were "location by Match Index interaction" (to determine the angles of regression), "location" by regions (to determine where the differences were if there were any), and the "Match Index" (to determine if there was any linear regression line). These variables were included since the branches of Bank A were divided into four regions, as previously described, and these variables could be an influence on the relationship of the two variables. Utilizing each performance measure, a series of three multiple regression

analyses was run. The first multiple regression analysis utilized Performance A (average number of transactions handled per month) as compared to the Match Index, location, and the Match Index by location interaction. The next run utilized Performance A and the Match Index plus the location variable. Finally, just Performance A and the Match Index were utilized. This same procedure was repeated for the four remaining proficiency measures assigned the labels Performance B, Performance C, Performance D, and Performance E, respectively. Performances A, C, D, and E were found to be nonsignificant; that is, there was no predictability of performance from the Match Index score. However, other variables were significant (either "location" or "interaction") which caused the Match Index to show no predictability of performance. Table 2 summarizes the significant variables from the multiple regression runs for Performances A, B, C, D and E.

Table 2

Significant Variables from the Multiple Regression Analyses for Performances A, B, C, D, and E for Bank A

	Significant Variables
Performance A (Average number of transactions handled per month)	Region A, $F(4,51) = 11.452$
	Region B, $F(4,51) = 7.037$
	Region C, $F(4,51) = 4.47$

Performance B (Frequency of differences/ 1000 transactions)	Match Index, $F(1,54) = 7.046$
Performance C (Net differences)	Region B, $F(4,51) = 4.469$
Performance D (Number of "other loss" items for which responsible)	No significant variables
Performance E (Other losses ($) for which responsible)	Region B, $F(4,51) = 4.316$

Note. $p < .05$.

Performance B (frequency of differences per 1000 transactions) was found to provide significant predictability. The factors "interaction" and "location" fell out of the regression equation as nonsignificant and only the Match Index was found to be a significant prediction of Performance B, $F(1,54) = 7.046$, $p < .05$, providing the regression equation: Performance B = -0.6682 (Match Index score) +1.7746.

The tellers of Bank A were then divided into several groupings to determine if there was a significant difference between them. Since no male tellers were tested, the division by sex and the division of Black males vs. White males could not be performed. A single factor, independent groups analysis of variance was calculated for each of the following groupings utilizing the Match Index as the dependent variable: Black tellers vs. White tellers, Black female tellers vs. White female tellers, and

part-time tellers vs. full-time tellers. All three analyses of variance were found to show nonsignificant differences between the groups. Table 3 summarizes the results and the groupings for each of those analyses of variance.

Table 3

Analysis of Variance Groupings and Results Utilizing Match Index Scores as the Dependent Variable for Bank A

Independent Variable	N	F
Males vs. Females	0 vs. 56	No Males Tested
Blacks vs. Whites	18 vs. 38	Nonsignificant
Black Males vs. White Males	0 vs. 0	No Males Tested
Black Females vs. White Females	17 vs. 39	Nonsignificant
Part-Time vs. Full-Time	13 vs. 43	Nonsignificant
Time on the Job (I)		Nonsignificant
6-7 months	15	
8-17 months	13	
19-39 months	14	
42+ months	14	
Time on the Job (II)		Nonsignificant (No Homogeneity of Variance between Groups)
6 months	8	
7 months	7	
8-11 months	7	
12-20 months	8	
22-32 months	8	
33-46 months	9	
54+ months	9	
Occupational Adjustment Index (I)		Nonsignificant
-.01 to .29	28	
.51 to .96	28	

Occupational Adjustment Index (II)		
-.01 to .29	14	Nonsignificant (No Homogeneity of Variance between Groups)
.30 to .50	14	
.51 to .72	15	
.75 to .96	13	

The tellers were then grouped according to their time on the job, in months, as a teller. Two single factor, independent groups analyses of variance based on different groupings utilizing the Occupational Adjustment Index (r) as the dependent variable were calculated. The first grouping was made up of four groups and the second was made up of seven groups. For both sets of groupings there were nonsignificant differences found between the groups. For the second set of groupings there was no homogeneity of variance between the seven groups.

The tellers were then grouped in a more traditional manner by Occupational Adjustment Index scores and two single factor, independent groups analyses of variance were calculated based on different groupings utilizing time on the job as the dependent variable. There were two groups in the first grouping and four groups in the second grouping. Both calculations showed that there were nonsignificant differences between the groups.

The intercorrelation matrix for the six job profiles is reported in Table 4.

Table 4

Correlations of Six Job Profiles for Bank A

Supervisor/ Trainer	1	2	3	4	5	6
1	1.0					
2	.8373	1.0				
3	.7889	.7672	1.0			
4	.9014	.7982	.8206	1.0		
5	.8526	.7879	.9404	.8646	1.0	
6	.8543	.8308	.9595	.8860	.9828	1.0

Note. $r = .7293$, $p < .10$. $r = .8114$, $p < .05$. $r = .9172$, $p < .01$. $r = .9741$, $p < .001$.

A split-halves reliability coefficient for the Match Index scores was computed and was found to be +.99, $p < .001$.

Experiment 2

Method

Subjects. The participants were 103 male and female tellers of at least six months experience from a different area bank (Bank B). The participants were made up of approximately 10% males and 90% females, 9% Blacks and 91% Whites, and 66% full-time tellers and 34% part-time tellers. Of the female tellers 8% were Black and 92% were White, and of the male tellers 20% were Black and 80% were White. Bank B emphasized to their tellers that their participation

was greatly needed in order to insure the success of this project, however, the tellers were not required to participate but participated on a voluntary basis. The participants were informed of the anonymity measures being utilized in this study, as was done in Experiment 1, and each teller was issued a code number which was the only identifier for that teller.

There were originally 104 tellers tested, but the results from one of those tellers could not be used since the Life Activities Inventory was not properly completed.

As in Experiment 1, the tellers were labeled (for the study) by their branch location and region. Bank B had only three regions which were determined by the same criteria as for the regions utilized by Bank A. Table 5 breaks down the number of tellers of Bank B by location and region.

Table 5

Tellers from Bank B by Location, Mean Match Index Scores and Standard Deviations by Regions

Regions (based on business volume and cash flow)	Bank Code Number	Number of Tellers	Total Number of Tellers/Region	Mean Match Index Scores/Region	Standard Deviation/ Region
Region A (Lowest)	2	2	31	55.33	26.405
	6	4			
	12	5			
	13	6			
	14	7			
	15	7			
Region B (Middle)	8	10	25	54.20	32.02
	9	6			
	10	5			
	11	4			
Region C (Highest)	1	12	47	38.64	28.34
	3	7			
	4	12			
	5	12			
	7	4			

Note. N = 103.

Procedure. The administration procedures were exactly the same for Bank B as they were for Bank A with the following exceptions: (1) Except for two occasions, there was no representative from the bank's Personnel Department present during the administration of the Life Activities Inventory to the tellers. However, since the administrations took place at the respective branch locations where the tellers worked, the branch manager acted as the representative of the Personnel Department. Each branch manager was personally contacted by a member of the bank's Personnel Department and briefed on the upcoming Life Activities Inventory administration and its importance to the bank. The tellers had prior knowledge of the date of the administration but were informed of its importance by the branch manager at the time of administration. As in Experiment 1, all aspects of the consent form were emphasized verbally and the forms were read and signed by the tellers before administration of the Life Activities Inventory. (2) The administration of the Life Activities Inventory to the tellers of Bank B, as previously noted, was done at the tellers' respective branches. Of the banks 16 branches in the area, 15 of them were visited and all 15 branch locations provided suitable testing facilities. Participants at the administration sessions ranged from two to nine tellers.

(3) The Personnel Department was asked to provide a list of six teller supervisors and, or teller trainers. Bank B was divided into only three regions and all three regions were represented by at least one supervisor/trainer (there were two from the largest region) and there were two supervisors/trainers from the Personnel Department.

After an overall "job profile" for Bank B was calculated (utilizing the same procedures as in Experiment 1) and the FORTRAN program was run, Bank B was requested to provide for each of the tested tellers the most recent proficiency measurement values available. None of the proficiency measures were older than 15 months. Branch managers at Bank B evaluated each of its tellers subjectively on several variables, rating them in one of three categories: (a) does not meet requirements (b) meets requirements (c) exceeds requirements. The variables for measuring on-the-job proficiency include: (a) knowledge of job duties (b) quality of work (c) quantity of work (d) attitude and cooperation (e) dependability (f) initiative and (g) attendance and punctuality. Also the following objective measures were included in the study at the request of officials at Bank B: (h) number of times, in days, that each teller's tallies are off and (i) the total amount, in dollars, that each teller is off balance. In addition, one other objective measure was included:

(j) mean amount, in dollars, that the balance was off per time that each teller was off balance. Measure "j" was generated from the information contained in measures "h" and "i". This yielded a total of 10 proficiency measurements, seven subjective and three objective. For the seven subjective categories ("a" to "g") for the purpose of grouping, "does not meet requirements" and "meets requirements" was designated as "below average", and "exceeds requirements" was designated as "above average". For the two objective categories ("h" and "i"), Bank B provided figures on a bank by bank basis for the same time period as for those values provided for the tellers (January, 1978 through February, 1979). And just as for Bank A, the same mean values were calculated for each of the categories. The tellers of Bank B were rated as either above or below average in categories "a" through "i". Each teller regardless of branch was compared according to the mean value calculated for all tellers by variable "j".

Results

Since the majority of proficiency measures utilized for Bank B were subjective, a factor analysis utilizing all ten proficiency measures was calculated in order to determine which factors were orthogonal and, or to rearrange or reduce the variables to a smaller set of factors.

Again utilizing SPSS, a factor analysis program was run inputting all ten of the proficiency measures, utilizing the options of principal factoring without iteration and VARIMAX orthogonal rotation. These options were chosen so that all of the factors would be orthogonal, and so that the first factor would be the most important component, accounting for the bulk of the variance. This combination of procedures allows for many variables to be reduced to a smaller number of factors. The factor analysis yielded three factors which accounted for approximately 70% of the variance. Table 6 summarizes the factor loadings for the factor analysis for Bank B.

Table 6

Factor Loadings for Proficiency Measures for Bank B Utilizing the Options of Principal Factoring without Iteration and VARIMAX Orthogonal Rotation

	Factor 1	Factor 2	Factor 3
Knowledge of job duties	0.71476	0.08654	-0.42685
Quality of work	0.69349	0.20443	-0.15968
Quantity of work	0.83391	0.04749	-0.12417
Attitude and cooperation	0.72336	-0.28116	0.16696
Dependability	0.82395	0.03964	0.16325
Initiative	0.76394	-0.22353	-0.15003
Attendance	0.76541	-0.07498	0.01911

Number of times, in days, that balance is off	-0.03097	0.02743	0.92917
Total amount tellers's balance is off	-0.07765	0.88426	-0.06387
Mean amount balance off per time that teller's balance is off	0.02863	0.84740	0.07333

Factor 1 included all seven of the subjective measures which showed the "highest" loadings. To be considered a high loading, the loading must be .40 or above. The highest loading for Factor 1 was on "quantity of work" (.834). Factor 2, the next most important factor, had two variables with high loadings: (1) total amount, in dollars, off balance and (2) mean amount, in dollars, that the balance was off per time that each teller was off balance. The highest loading for Factor 2 was "total amount". And Factor 3 included "number of times, in days, that tallies are off" as its highest loading. Therefore, Factor 1 became defined as "quantity of work", Factor 2 as "total amount, in dollars, off balance", and Factor 3 as "number of times, in days, that tallies were off balance".

A multiple regression analysis was computed to determine if there was any relationship between the Match Index and the three proficiency measures, Factors 1, 2, and 3. The same variables (Match Index by location interaction,

location, and Match Index) were included as they were in Experiment 1 and the same series of three multiple regression analyses was run for each of the three proficiency measures. Factors 2 and 3 were found to be nonsignificant; that is, there was no predictability of performance from the Match Index score. None of the other variables ("location" or "interaction") were significant either in any of the multiple regression runs. Factor 1 ("quantity of work"), however, provided significant predictability. The variables "interaction" and "location" fell out of the equation as nonsignificant and the Match Index proved to be significant with Factor 1 providing the regression formula Performance A = 0.45 (Match Index) +1.26.

The tellers of Bank B were then divided into several groupings to determine if there was a significant difference between their mean Match Index scores. A single factor, independent groups analysis of variance was calculated for sex (males vs. females) and another single factor, independent groups analysis of variance was calculated for part-time tellers vs. full-time tellers with both comparisons utilizing Match Index as the dependent variable. Both comparisons were found to yield significant differences between the groups. However, there was no homogeneity of variance between the groups in either

comparison. Table 7 summarizes the results and the groupings for each of the analyses of variance.

Table 7

Analysis of Variance Groupings and Results Utilizing Match Index Scores as the Dependent Variable for Bank B ($p<.05$)

Independent Variable	N	F
Males vs. Females	10 vs. 93	$F(1,101) = 29.790$[a]
1st Quartile Males vs. 1st Quartile Females	3 vs. 23	$F(1,24) = 56.07$
4th Quartile Males vs. 4th Quartile Females	3 vs. 23	$F(1,24) = 19.03$
Blacks vs. Whites	9 vs. 94	Nonsignificant[a]
Black Males vs. White Males	2 vs. 8	Nonsignificant
Black Females vs. White Females	7 vs. 86	Nonsignificant
Part-Time vs. Full-Time	35 vs. 68	$F(1,101) = 4.686$[a]
1st Quartile Part-Time vs. 1st Quartile Full-Time	9 vs. 17	$F(1,24) = 19.61$
4th Quartile Part-Time vs. 4th Quartile Full-Time	9 vs. 17	Nonsignificant
Time on the Job (I)		Nonsignificant
6-7 months	26	
8-14 months	24	
15-35 months	27	
41+ months	26	

Time on the Job (II)		$F(7,95) = 2.34$
6 months	14	
7 months	12	
8-9 months	13	
10-14 months	11	
15-19 months	14	
20-41 months	14	
51-72 months	12	
79+ months	13	
Occupational Adjustment Index (I)		Nonsignificant[a]
-.22 to .50	44	
.51 to .92	59	
Occupational Adjustment Index (II)		Nonsignificant[a]
-.22 to .39	26	
.41 to .55	26	
.56 to .70	26	
.71 to .92	25	

Note. [a]No Homogeneity of Variance between Groups.

Since significant differences were found between the pairings males vs females and part-time tellers vs. full-time tellers, multiple regression analyses utilizing the same variables (Match Index by location interaction, location, and Match Index) as discussed previously were run with Factor 1. Multiple regression analyses utilizing Factor 1, the three aforementioned variables and just the male tellers produced nonsignificant results. Nonsignificant results were also found when multiple regression analyses utilizing just female tellers, and when utilizing just part-time tellers. Significant predictability of performance for full-time tellers utilizing

Factor 1 was shown and provided the regression formula Performance A = .80 (Match Index) + 1.06.

In order to look more closely at these groupings and to discover where the significant differences between the groups occur, the Match Index scores (utilizing sex as the independent variable) were broken down into quartiles and the fourth quartiles of the male vs. female grouping were compared with a single factor, independent groups analysis of variance and the first quartiles of the male vs. female grouping were compared with a single factor, independent groups analysis of variance. Both analyses of variance were significant, indicating significant differences between male and female scores in the first and fourth quartiles. Likewise, comparing the Match Index scores (with part-time tellers vs. full-time tellers as the independent variable) utilizing the first and fourth quartiles as previously done with single factor, independent groups analyses of variance, yield a significant difference between the first quartile scores and a nonsignificant difference between the fourth quartile scores.

Other single factor, independent groups analyses of variance were calculated utilizing Match Index scores as the dependent variables (Black males vs. White males, Black females vs. White females, and Blacks vs. Whites)

and all of the comparisons were found to show nonsignificant differences between groups. Two of these comparisons (Black males vs. White males and Black females vs. White females) had homogeneity of variances between groups whereas the Blacks vs. Whites comparison did not have homogeneity of variances between groups.

The tellers were then grouped according to their time on the job (independent variable) as a teller. Two single factor, independent groups analyses of variance based on different groupings were calculated utilizing the Occupational Adjustment Index score (r). There were four groups for the first grouping and there was a nonsignificant difference between the groups. The second grouping had eight groups and there was a significant difference between these groups. A Duncan Multiple Range Test was run to determine where the differences were. All possible pairings of the eight groups were significantly different from one another except for the following pairings: groups two and four, three and five, four and eight, five and seven, eight and one, seven and six.

The tellers were then grouped more traditionally with the independent variable being the Occupational Adjustment Index scores and two single factor, independent groups analyses of variance were calculated based on different groupings utilizing time on the job in months. The first

comparison utilized two groups and the second comparison utilized four groups. Both comparisons yielded nonsignificant differences between the groups and there was no homogeneity of variance between the groups in either comparison.

The intercorrelation matrix for the six job profiles is reported in Table 8.

Table 8

Correlations of Six Job Profiles for Bank B

Supervisor/ Trainer	1	2	3	4	5	6
1	1.0					
2	.6199	1.0				
3	.5705	.6955	1.0			
4	.7536	.6869	.5010	1.0		
5	.6812	.8101	.4823	.8726	1.0	
6	.8033	.6915	.3577	.7274	.8265	1.0

Note. $r = .7293$, $p < .10$. $r = .8114$, $p < .05$.

A split-halves reliability coefficient for the Match Index scores was computed and was found to be +.97, $P < .001$.

Discussion

One of the strengths of the Job Matching System is that there is a type of job analysis, in the form of the job profile, that is completed by the supervisor of every job that the Job Matching System is used in conjunction

with. This practice conforms to the standards established and recommended by the EEOC (1978) and by Freyd (1923) and also establishes the Job Matching System as a job-related instrument. In this study, however, overall, final versions of the job profiles that were used in each of the experiments were compiled somewhat differently than the format recommended by Cleff. According to Cleff (1978), the Job Behavior Summary and the Job Card Sort should be administered to the supervisors, and then in an open discussion with all of the supervisors, a consensus of opinion for a "score" for each of the 16 Dimensions of Work should be reached. If, for example, three supervisors had scores of "10", "15", and "7" for one of the Dimensions of Work, then a consensus score must be agreed upon, which is to be used in the "overall" job profile for that job. This consensus process would be repeated for each of the 16 Dimensions. In this study, six supervisors/trainers at each bank were given the Job Behavior Summary and the Job Card Sort and then a mean value was calculated for each of the 16 Dimensions of Work. This served as the overall job profile for each bank. It is possible that this method for computing the overall job profile, as opposed to the "consensus" method proposed by Cleff, could have caused less meaningful Match Index scores to be generated. Correlations for the six job profiles utilized in Experiment 1

(Bank A) produced a range of .76 to .98, $\bar{r}$ = .86. All of the profiles for Bank A show strong similarity and the overall conception of the position of teller for Bank A appears to be universal for all six of the supervisors/trainers. This is significant to note since all four of the regions of the bank and the Personnel Department were represented by these supervisors/trainers. Therefore, the Match Index scores ($\underline{r}$ between the job profile and the combined person profile) would appear to project a more realistic picture of the tellers as they compare to the overall job profile than if the six profiles were dissimilar. The job profiles in Experiment 2 (Bank B), however, were somewhat different. Their correlations ranged from .36 to .87, $\bar{r}$ = .67. One job profile ranged from .36 to .70, $\bar{r}$ = .52. The profiles for Experiment 2 did not appear to reflect as strong of an universal concept of the ideal teller as was found in Experiment 1. Therefore, it appeared that there was a difference of opinion among the six supervisors/tellers concerning the concept of the ideal teller for Bank B which subsequently reflected a difference of opinion among the three regions of the bank and the Personnel Department. Because of this, the Match Index scores for Bank B may not be as meaningful as they may have been had the correlations between the job profiles been higher. Future studies utilizing the Job Matching

System should note this fact and strongly consider utilizing the Cleff "consensus" method, as outlined previously.

One of the main objectives of this study was to demonstrate relatedness between the Match Index (r) and on-the-job proficiency measurements utilizing both objective and subjective proficiency measures. In Experiment 1, utilizing five "objective" proficiency measures, only one measure ("frequency of differences per 1000 transactions) yielded a significant regression equation. It should be noted that that equation includes a negative slope value. This occurred since the teller's proficiency ratings were judged to be "above average" or "below average". The multiple regression analyses confirmed an inverse relationship between Match Index scores and the proficiency measure. It was, of course, desirable for the tellers to show low frequencies of difference per 1000 transactions and this accounted for the negative slope value.

It should also be noted that in Experiment 1 the four regions of Bank A were not equal in teller representation. Although this was not an assumption of the multiple regression analysis, it should be noted that Region A only had four tellers, whereas the other three had eight, 18, and 26, respectively.

In Experiment 2, of the three factors identified by the factor analysis, only one of those measures, a subjective measure (quantity of work) showed a relationship with the Match Index scores. The problem of utilizing valid criteria measures appears to be one explanation for the repeated occurrence of nonsignificance between the proficiency measures and the Match Index scores. Cleff (1977) discusses the difficulty of locating organizations that rate their employee's on-the-job proficiency in strictly objective terms. Of course, in many cases this would be impossible to do, and in other cases it is just not done. However, there appear to be certain measures which are "more objective" than other measures and therefore could be more useful in a study such as this which utilizes the Job Matching System. It may be questionable as to whether some "objective measures" are "objective" enough to be utilized as proficiency measures. For example, in Experiment 1 the four "objective" measures that were found to be nonsignificant in their relationship with the Match Index scores were all based on average performances per teller. An extremely deviant proficiency measure "score", either positive or negative, which occurred quite often in this study, either raised or lowered the "average" performance per teller. Utilizing median performance measure scores could be a possible remedy for

this situation. However, in this study that alternative was impossible due to the unavailability of all of the necessary information. The one performance measure shown to be significant in Experiment 1 was based on differences per 1000 transactions, and thus appeared to be a stronger means of comparison since there was a relationship with the Match Index score and also since the measure was not scaled as above or below average. Similarly, in Experiment 2 the two "objective" proficiency measures ("total amount of $ off balance" and "number of times off balance") did not show significant predictability to be useful either. Cleff (1977) maintains, and this study provides some credence for the fact, that certain "objective" measures appear to provide better predictability with Match Index scores than do some other measures. Future studies should probably utilize only those objective proficiency measures which measure performance in definite amounts and should not be compared to average amounts of performance, if at all possible. Cigarettes produced per hour by a machine that a person is responsible for or the number of computer cards key-punched per time period could offer more valid measures of proficiency than those measures utilized in this study.

The subjective proficiency measures provide other variables to consider. This study set the standards high

for the supervisors' ratings to be scaled as "above average". The teller that was rated "meets requirements" by his bank supervisor was rated "below average" for purposes of grouping for this study. Also, there is a problem of inter-rater reliability when subjective ratings are utilized as they were in Experiment 2. The factor analysis showed that all seven of the subjective measures accounted for approximately the same amount of variance, with "quantity of work" accounting for the highest amount of variance by itself.

As with validation studies conducted by Cleff (1977), this study has shown that a relationship of predictability with both objective and subjective proficiency measures and Match Index scores does exist, with the exceptions and provisions noted above.

After calculating which proficiency measures were predictable from Match Index scores, it was necessary to determine for which groups that the regression formulas would be applicable. That is, if there were significant differences between certain comparison groups (males vs. females, and so forth), then it would be necessary to generate different regression equations utilizing the significant proficiency measures, the desired group (male tellers, female tellers, and so forth) and the other variables discussed previously which were utilized in running

the previous multiple regression analyses. The hypothesis of nonsignificant differences between groups was made in order to show conformity to, and strength for the Job Matching System in conforming to regulations concerning minority discrimination. In both experiments, the pairings were made and the analyses of variance were computed. Unfortunately, no male tellers were tested in Experiment 1 and a number of obvious comparisons were unavailable. This is even more unfortunate since Experiment 2 showed some results converse to those hypothesized. For the comparisons made in Experiment 1 (see Table 3) utilizing the Match Index scores as the dependent variable, there were nonsignificant differences shown between the groups, just as hypothesized. Therefore, the Job Matching System was shown to have no adverse impact on any of the minority groups in Experiment 1.

In Experiment 2, the results were not as clear-cut. As hypothesized, nonsignificant differences were found between three of the comparisons (see Table 7) utilizing the Match Index scores as the dependent variable. These results support the findings in Experiment 1. Several observations, however, should be noted concerning these findings. In the Black female vs. White female comparison there was no homogeneity of variance between the groups and it was possible that the comparison was taking advantage

of chance. The possibility of a Type II error was good since there were only seven Black females tested as opposed to 86 White females.

The robustness of the analysis of variance allows us to violate the assumption of homogeneous variances without serious risk only if the number of cases in each sample is the same. Very serious questions concerning the validity of a conclusion can be raised when there is no homogeneity of variance between groups (Hays, 1973, p.482).

In the other two comparisons, Black males vs. White males and Blacks vs. Whites, even though there were non-significant differences between the groups and there was homogeneity of variance between the groups, the number of tellers in each group may have caused the results to be suspect. There were only two Black males tested versus eight White males and nine Blacks as compared to 94 Whites. Breakdowns such as these which result in such disproportionate and, or small samples, can cause inexplicable and, or unusual results due to the loss of degrees of freedom and because the comparisons may have taken advantage of chance. This, of course, is in spite of the robustness of the analysis of variance test (Hays, 1973, p. 518).

The two remaining pairs of comparisons utilizing the Match Index scores as the dependent variable (males vs.

females and part-time tellers vs. full-time tellers), both yielded significant differences between the groups. This appears to indicate that the Job Matching System has shown discrimination between the groups and caused an adverse impact to occur. However, in both comparisons the variances were not homogeneous. Also, the groups compared were not equal for the number of cases in each group. There were ten males versus 93 females and 35 part-time tellers vs. 68 full-time tellers tested. As before, inferences made on the outcome of an analysis of variance when the variances are not homogeneous are highly suspect.

Since this study demanded no manipulation of subjects, further calculations were made. The restrictions and implications noted previously should temper the interpretation of the following conclusions. For both comparisons above (part-time vs. full-time and males vs. females), the Match Index scores were divided into quartiles and the first and fourth quartile Match Index scores were compared with single factor, independent groups analyses of variance. The first quartile male scores were compared to the first quartile female scores and a significant difference was found between the two. A similar analysis of variance utilizing the fourth quartile Match Index scores was also significant. Again, neither of the groupings showed homogeneity of variance between the groups,

and the interpretation was suspect since there was an unequal number of cases within each group (three males vs. 23 females). Also, we have restricted the range of scores that were in each group and we lose degrees of freedom which, therefore, reduce the power of the test. Comparing the first quartile scores of the part-time tellers to the full-time tellers with a single factor, independent groups analysis of variance produced a significant difference between the groups. A similar comparison utilizing fourth quartile scores produced a nonsignificant difference between the groups. Once again we have restricted the range of scores and the interpretation of such results may be quite misleading. It appears, however, that the differences between the part-time and the full-time tellers occur in the first quartile and for the males and females in both the first and the fourth quartiles.

Assuming that the significant differences between groups shown above are meaningful, it would be necessary to generate regression equations to use with each of these groups which were significantly different from the others. Utilizing the proficiency measure "quantity of work", the multiple regression analysis procedure as outlined earlier was followed, first utilizing only part-time teller's Match Index scores, then only those for the full-time tellers, then only those for the males, and then only those

for the females. All of the runs provided nonsignificant results except for the full-time tellers. These unusual results apparently result from the lack of homogeneous variances for the analyses of variance.

Finally two other major comparisons utilizing the analysis of variance were made. High turnover rates and attitude problems in tellers are problems shared by both banks in this study and presumably by all other banks. With teller training becoming increasingly more costly due to the addition of more sophisticated equipment and from normal increases of services, it has become paramount that banks, if not all employers, validate an instrument that can help to increase the likelihood of hiring employees who will remain on the job for a reasonable length of time. It was hypothesized that the Job Matching System could be just such an instrument. The Occupational Adjustment Index (r) and the time on the job figures for the tellers were used for the purpose of predicting longevity on the job. The Occupational Adjustment Index is a Pearson product-moment correlation coefficient for the teller's preferences scores and their experiences scores. It was hypothesized that those persons with longer periods of time on the job would have higher Occupational Adjustment Index scores. If this were so, the Job Matching System would provide the employer with interested employees whose

chances of success on the job would be very high (high Match Index scores) and those with a high probability of staying on the job for a reasonable length of time (high Occupational Adjustment Index scores).

Certainly there are many other factors involved in the high teller turnover rates experienced by the banks which are beyond the scope of this study to examine. However, occupationally well-adjusted workers may help to lessen these problems. To examine this, Bank B tellers were divided first into two groups based on the Occupational Adjustment Index scores (the independent variable) and then into four groups and single factor, independent groups analyses of variance were run on each of the groupings utilizing time on the job as the dependent variable. Both analyses of variance showed nonsignificance between the groups and neither grouping showed homogeneous variances. When similar groupings were done with Bank A tellers, the results were also nonsignificant and only the first grouping for Bank A showed homogeneous variances. Since all of the groups were essentially equal in the three analyses of variance that showed no homogeneous variances, we can conclude that there was no relationship between the Occupational Adjustment Index and time on-the-job. However, for Bank A nonsignificant differences between groups were found for the groups which

had an unequal number of tellers. There were homogeneous variances between the groups in those comparisons. It appears, then, that there were tellers who had been on the job for a long period of time who had low Occupational Adjustment Index scores and those who had high Occupational Adjustment Index scores also. The same was true of the scores for those who had been on the job for a short time. The failure to find a significant relationship between the Occupational Adjustment Index and time on the job may have been due to the arbitrary groups that were established by the experimenter. Since there were no criterion for grouping the independent variable (the Occupational Adjustment Index), priority was given to establishing groups that were as evenly populated as possible. Possibly, some other more meaningful groupings may have enhanced the possibility of finding significant differences between the groups. It is hoped that future studies can show some strong validity for the hypothesis that there is predictability of time on the job from the Occupational Adjustment Index since such knowledge could prove invaluable to bankers as well as to other employers.

A less traditional type of analysis of variance was devised utilizing time on the job as the independent variable and the Occupational Adjustment Index scores as the dependent variable. For Bank B, two analyses of variance

were computed based on four groups and eight groups respectively. Nonsignificant differences were found for the four groups and significant differences between the eight groups were found. Since there was no rationale to base these groupings on either, priority was given to making the groups as even as possible. Therefore, the significant difference found may be a Type II error. However, utilizing the Occupational Adjustment Index as the independent variable was hardly appropriate for the banks since they were interested in the predictability of the length of time on-the-job from the Occupational Adjustment Index rather than the arrangement utilized in this comparison. In the event that certain tellers are rehired or experienced tellers are transferred from another bank, this paradigm may prove to be useful. From the teller's previous time on the job a regression formula could predict the Occupational Adjustment Index. This paradigm does not appear to be the most practical use of the Job Matching System for the banks. Similar analyses utilizing Bank A values resulted in nonsignificant differences between groups whether there were four groups or seven groups.

It appears that many factors have become involved in this validation study. Some lend themselves to a more obvious explanation than do some of the others. However,

there are many encouraging signs for the Job Matching System as a selection tool of the future. It was hypothesized and confirmed that Match Index scores could be used to predict job proficiency measurements whether that performance be measured subjectively or objectively. It would have been desirable, of course, if more performance measures had shown predictability from Match Index scores. However, as previously discussed, the limitations of the proficiency measures themselves may be a partial explanation for this. Future studies should endeavor to include objective performance measures that are as "objective" as possible. This provision may sound like a limitation of the Job Matching System but actually it may be an asset since a prime example of the maximum usefulness of the Job Matching System could be at the entry level positions for a large manufacturing operation. This application of the Job Matching System is discussed by Cleff (1977) and would seem to be quite an appropriate application of the instrument. Further validation would be necessary to make this a reality.

A prime objective of the Job Matching System was to develop a selection instrument that would not discriminate on the basis of race and, or sex and could show job relatedness. Some hypothesis were upheld and some remained unanswered since there were some questions raised due to

the lack of homogeneous variances and, or the limited numbers of cases in certain groups of comparisons.

This concurrent type criterion-related validation study is by no means complete and conclusive. It is hoped that the banks will initiate, based on the favorable signs in this study, a program of testing all of their teller applicants and compare the obtained Match Index scores of those tellers that they hire to the job proficiency measures of those same tellers after a set period of time. It appears that the banks in this study have a tool which will provide predictability for them. Other validated proficiency measures, if available, could further enhance those evaluation and selection powers.

It is also hoped that this study will provide an impetus to others to investigate the possibilities of job matching and most especially the Job Matching System.

APPENDIX A

16 Dimensions of Work

JOB MATCHING SYSTEM - BEHAVIOR PROFILE

Concrete Orientation	AVOIDANCE Strong -20 -15	High -10	Low -5	0	APPROACH Low +5	High +10	Strong +15 +20
C-1 CORRECTION: Make sure concrete things work as they should; repair, inspect.							
C-2 LOCOMOTION: Move around a lot in any vehicle or on foot; drive cars, trucks, busses, cycles.							
C-3 MANUAL-INDEPENDENT: Use hands & tools, little regulation; some skill used to make or assemble things.							
C-4 MANUAL-DEPENDENT: Use hands & tools, close regulation; make or assemble things by the numbers, little skill used; run automatic machinery.							

C-5	ORDER: Keep concrete things neat, where they belong, clean and orderly, lubricated.
C-6	GO FOR: Do heavy work, run errands: lift, push, carry heavy objects.
Social Orientation	
S-1	EXPLORATION: Find out or respond to someone else's intentions; listen, notice changes, respond appropriately.
S-2	MANAGEMENT: Influence and be responsible for others' future actions; guard, train, supervise, teach.
S-3	PERSUASION: Convince other people to act <u>now</u>; sell, persuade, hustle, convince.

S-4 PHYSICAL SERVICE: Meet specific and personal physical needs of other people, feed, bathe, clothe others.

S-5 ATTENDING: Deal with people in an impersonal but courteous superficial way, polite and regulated by rules & procedures.

Information Orientation

I-1 INNOVATION: Use personal opinion, imagination or art to deal with unique problems, situations.

I-2 VERBAL-WRITTEN: Use written words to deal with problems & situations, write, read, communicate.

I-3	VERBAL-ORAL: Use words orally to deal with situations & problems, discuss, converse, explain, communicate.
I-4	NUMERICAL: Use numbers to deal with problems and situations, measure, calculate, count.
I-5	CLERICAL: Keep admin. details in an orderly, logical way; file, list process forms & paperwork.

APPENDIX B

Consent Form

Consent Form

The Personnel Department of (their bank) in an effort to increase their proficiency in the selection of personnel for the position of bank teller is participating in a study to determine if the following procedure is capable of assisting in that selection process. You will be asked to answer some questions concerning things that you like to do and things that you do not like to do, and some questions concerning things that you have and have not done in the past. The answers to these questions are to be regarded as strictly confidential. No one on the staff at (their bank) will have access to these answers. Your administrator, me, will be the only one to have access to these answers. To further insure your anonymity you will be given a number to use as your name on the answer sheet and I will be the only one with a "key" to those numbers. (Their bank) will receive and is only interested in receiving the overall results of this study and not individual results.

This study has no bearing whatever on your present job or your present status with (their bank). It is being conducted only to evaluate the procedure and not the individuals involved. No "grades" or "scores" of any kind will be revealed concerning individual answers in this study.

Your help in this study will be quite useful and most beneficial to (their bank). If, however, at any time you wish to leave and not continue in this study, you are free to go. Upon your departure all materials that you have used will be destroyed.

Date	Signature

APPENDIX C

Sample Page from the Life Activities Inventory

GROUP 2

Likes/Dislikes Instruction Reminder

Read all 16 phrases.

Circle "++" to the right of those 2 you like most.
Cross out the 2 phrases.

Circle "--" to the right of those 2 you dislike most.
Cross out the 2 phrases.

Circle '+" to the right of those 3 you like most in the remaining 12 phrases.
Cross out the 3 phrases.

Circle "-" to the right of those 3 you dislike most of the remaining 9 phrases.

		Circle 2	Circle 2	Circle 3	Circle 3
1.	Collect weekly insurance payments.	++	--	+	-
2.	Sort laundry	++	--	+	-
3.	Make out clerical forms	++	--	+	-
4.	Shampoo hair of other people	++	--	+	-
5.	Operate automatic punch press	++	--	+	-
6.	Audit bookkeepers' ledger entries	++	--	+	-
7.	Get voters to register	++	--	+	-
8.	Paint with spray gun	++	--	+	-
9.	Have current events discussions	++	--	+	-

Cross out the 3 phrases.

Review your work, you should have circled:

2 "++"
2 "--"
3 "+"
3 "-"

10.	Screen applicants for hiring	++	--	+	-
11.	Operate road grader	++	--	+	-
12.	Follow complicated written instructions	++	--	+	-
13.	Ask professor to clarify instructions	++	--	+	-
14.	Inspect houses for damage	++	--	+	-
15.	Invent solutions to problems	++	--	+	-
16.	Run errands for store	++	--	+	-

APPENDIX D

Sample Page from the Job Behavior Summary

GROUP 1

1.	Make out administrative forms.....		
2.	Operate adding machine.....		
3.	Listen to and follow instructions.....		
4.	Drive truck or car.....		
5.	Devise new marketing techniques.....		
6.	Letter small signs or placards.....		
7.	Listen to professors talk.....		
8.	Follow written instructions.....		
9.	Check others work against standards.....		
10.	Help train new workers.....		
11.	Tidy up store or office.....		
12.	Work with numbers.....		
13.	Convince customer to give more time.....		
14.	Take orders on telephone.....		
15.	Carry heavy things.....		
16.	Administer medication.....		

APPENDIX E

Job Card Sort

	RANK (1 to 16)
CORRECTION: Make sure that concrete things work as they should; repair or inspect concrete things.	
LOCOMOTION: Move around a lot in any vehicle or on foot; drive cars, trucks, buses, cycles.	
MANUAL-INDEPENDENT: Use hands and tools with little regulation; some skill used to make or assemble things.	
MANUAL-DEPENDENT: Use hands and tools under close regulation by others or machinery; make or assemble things "by the numbers", little skill needed.	
ORDER: Keep concrete things neat, orderly, where they belong, lubricated.	
GO FOR: Do heavy work, run errands; lift, push, carry heavy things.	
EXPLORATION: Find out or respond to someone else's intentions; listen; notice changes in expression, respond appropriately to a person.	
MANAGEMENT: Influence and be responsible for the future actions of other people; train, teach, supervise.	
PERSUASION: Convince other people to act now; sell, convince, hustle, persuade.	

PHYSICAL SERVICE: Meet the specific personal physical needs of other people; feed, bathe, clothe others.	
ATTENDING: Deal with other people in an impersonal and polite but relatively superficial way, regulated by rules and procedures of courtesy.	
INNOVATION: Use personal opinion, imagination or art to deal with unique situations and problems.	
VERBAL-WRITTEN: Use written words to deal with problems, situations; write, read, communicate.	
VERBAL-SPOKEN: Use words orally to communicate and to deal with problems and situations; discuss, explain, converse.	
NUMERICAL: Use numbers to deal with problems and situations; measure, calculate, count.	
CLERICAL: Keep administrative details in an orderly and logical way; file, list, process forms.	

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