Center for
Effective
Organizations

THE IMPACT OF INDIVIDUAL DIFFERENCES ON THE SOCIALIZATION OF WORKERS TO A TECHNOLOGICAL INTERVENTION

CEO PUBLICATION
T 94-25 (268)

K. MICHELE KACMAR
Florida State University

PATRICK M. WRIGHT
Texas A&M University

GARY C. MCMAHAN
University of Southern California

June, 1994

The Impact of Individual Differences on the Socialization of Workers to a Technological Intervention

ABSTRACT

This study examined the role of ability, motivation, and their interactions in the effectiveness of the use of training as a socialization tool. Ability (self-esteem and cognitive ability), motivation (attitude toward education and training motivation), and performance measures were collected three to four months prior to a training intervention aimed at socializing warehousers into the use of a new technology. Attitudes and job performance were measured again three to four months after training. Results indicate that attitude toward education interacted significantly with both cognitive ability and self-esteem in predicting job satisfaction changes, but not the other dependent variables. Implications for the use of training as a socialization tool are discussed.

The Impact of Individual Differences on the Socialization of Workers to a Technological Intervention

The importance of information technology (IT) in our work lives grows daily. More and more tasks, once completed by hand, are being turned over to machines. However, these machines do not run themselves. Instead, each must be guided, monitored, and maintained by people. More often than not, however, the current work force is not prepared to handle such tasks (Goldstein, 1989). Therefore, IT training is becoming an increasingly important aspect in virtually all organizations (Gist, Schwoerer, & Rosen, 1989). Even with its increased importance, little empirical research has been performed in this area. Hence, the purpose of this paper is to explore several potential relationships that should be of interest to researchers and practitioners in this field. Specifically, this research asks and answers the question: Do motivation and ability affect the effectiveness of IT training programs designed to socialize workers to a new technology.

Technology Advances and Socialization

It has been suggested that advances in automation and information technology will result in increased productivity and product quality (London & Bassman, 1989). One potential outcome from this increase is a stronger market share in the global economy and a competitive advantage for the United States (Cascio & Zammuto, 1987). However, before this can occur, the employees must be able to perform the new jobs dictated by the automated processes. This may not be as easy as it sounds, especially for a unionized work force who have been trained and socialized NOT to think, but to simply follow rules.

Howell and Cooke (1989) noted that the demands of operating sophisticated computer technology require that the employee be an even more sophisticated information processor and decision maker than the computer. The more complex the automated system, the more complex the information processing and decision making will be for the employee (Dickerson & Gentry, 1983; Hirschman, 1980). However, even when the system requirements are not complex, workers may

perceive them to be, and perceived complexity of the new system has long been recognized as a factor inhibiting the successful implementation of new technology (Hill, Smith, & Mann, 1987; LaBay & Kinnear, 1981). Further, cognitive laziness, which infects a workers who has performed his or her job so long that it has become an automatic process, also may cause a new computerized system to be seen as more complex than it actually may be (Fleishman & Mumford, 1989).

An additional constraining factor of the implementation of technological advances is the employee's perception of loss of control. Computer illiterates and those afraid of machines view computers as too complex to ever be controlled (Hill et al., 1987). This fear, coupled with the natural tendency of individuals to resist change, increases the chance for strain on the employees involved and decreases the likelihood of a smooth adoption process. Thus, given the pressures associated with a large scale technological change, individuals are likely to feel great anxiety. This anxiety might be expressed through lower reported job satisfaction and organizational commitment, higher intent to leave, and lower job performance.

One of the most useful steps that can be taken to combat the inhibiting factors that arise during the implementation of a technological advancement is socialization to the new job processes through training (Goldstein, 1989). Since a major technological intervention virtually causes each employee to become a new entrant to a job, socialization to that job and with the new environment can be accomplished through training (Feldman, 1989). Specifically, providing employees with the knowledge required to perform the automated job, as well as the confidence that they CAN perform the job, will go a long way in decreasing apprehension and resistance to the technological change.

Factors Affecting Training for Technology

There are a variety of factors that can affect the success of a socialization-based training program. In general, they can be divided into three broad components: organizational factors, environmental factors, and individual factors. Organizational factors include such items as top management's involvement and support of training, the organization's culture and its attitude towards training, and how closely successful completion of training programs and subsequent rewards are linked. Factors such as where the training takes place, what methods are used to present the material, and who the trainer is make up the realm of environmental factors. Finally, and most important for this paper, there are the individual factors that affect training outcomes. Two of these factors which are examined below are motivation and ability.

Motivation and Ability

Even when two individuals are sent to the same training class, are exposed to the same trainer, and experience the same lectures, exercises, and examinations, what each walks away with from the training session will differ. Two reasons that have been used to explain why this might occur are the level of motivation and ability that each trainee brings to the training class with him or her (Kanfer & Ackerman, 1989).

Motivation. Individuals must be motivated to take part in the training process. That is, individuals must be open to the experience and feel that the training process will be of benefit to them before any significant learning can occur (Noe & Schmitt, 1986). Because the level of motivation an individual has for a particular training program is not static, it can be adjusted. This adjustment can be made by the individual, the trainer, or the organization. For example, goal setting theory can be used to set specific, hard goals that can motivate an individual to absorb more from the training program than he or she would have if no goals were present. Further, the goals can be self-set, set by the trainer, or set by the organization (Goldstein, 1991).

A second theory that can be used to explain an individual's motivation for training, and one that can be used to show how it can be altered, is expectancy theory (Vroom, 1964). Briefly, this theory is based upon the cognitive expectancies concerning outcomes that could result as a function of the individual's involvement in the training program, and how much the individual values the outcomes. If the individual views the outcomes as extremely positive and values them highly, he or she will be more motivated to succeed in the training program than an individual who has a lower valence for the outcomes. Further, there has to be a clear link in the eyes of the trainee between the outcomes and successful performance in the training program. Hence, management and the organization are essentially responsible for locating outcomes that are salient to trainees and then clearly showing how success in the training program will lead to these outcomes. If these responsibilities are met, an increase in training motivation should follow.

In essence, both of these theories are predicting that an increase in training motivation will lead to more positive training outcomes. With respect to IT socialization training, these positive outcomes could include a reduced fear of the new technology, a stronger sense of control, and a more positive attitude about the automation process. Abstracting this even further, it could be suggested that these specific positive outcomes will lead to even more general positive organizational outcomes such as increased job satisfaction, decreased intent to leave, increased performance, and increased organizational commitment. Hence, based upon the above analysis, we predict that:

> **Hypothesis 1:** A strong motivation for training will lead to more positive attitudes, intentions, and performance than will a lack of motivation for training.

Ability. A second possible factor that influences the usefulness of a training program for both the individual and the organization is the inherent ability possessed by the trainee. Unlike motivation, general cognitive ability is not as easily changed. Instead, the individual brings with him or her to a training program a preset level of ability. It is up to the organization to

acknowledge this fact and to select individuals for training who are capable of learning the required material (Fleishman & Mumford, 1989).

Whether general ability or specific abilities are better predictors of training success has generated some discussion. While the verdict may still be out, there is strong evidence (Hunter, 1986; Thorndike, 1985) to support the notion that "for most jobs, "g" accounts for all of the significantly predicted variance; other testable ability factors, independent of "g", add practically nothing to the predictive validity" (Jensen, 1984, p. 101). This suggests that:

> **Hypothesis 2:** Individuals with higher cognitive ability will report more positive attitudes, intentions, and performance as a result of the training program.

Finally, it is possible that these two variables will also interact with one another. In fact, Vroom's (1964) model of performance p=f(m X a) proposes an interaction between motivation and ability in determining performance. This interactive relationship might also be observed for the effectiveness of training as a socialization tool. That is, although it is predicted that high levels of motivation for training or cognitive ability will lead to positive organizational outcomes, it may be that individuals who are high in one or the other of these may not report positive organizational outcomes when these two variables are combined. Therefore,

> **Hypothesis 3:** Training motivation and cognitive ability will interact to explain organizational outcomes.

To recap, the present study examined the role of training as a means of socializing workers into newly automated jobs. Specifically, several individual difference variables that were predicted to impact the affect of the training were regressed upon attitudes, intentions, and performance.

Method

Overview

Data were collected at two points in time from hourly workers in a Parts Distribution Warehouse of a Fortune 500 appliance manufacturer. The first data collection (Time 1) took place after the announcement of a major technological intervention, but prior to any automation training being performed. The second round of data (Time 2) was collected after each individual in the organization had attended approximately 13 2-hour training programs designed to teach him or her how to perform the newly automated positions.

Sample

Subjects were employed as warehousers for a Fortune 500 manufacturer of home appliances. All subjects were members of the United Auto Workers. In general, the job entailed selecting and packing orders for parts. Specifically, an employee would take a stack of cards which listed the part number to be picked, the quantity, and the location of the part, and using an electric cart pulling flat bed carriers behind it, drive to the location indicated, pick the part, staple the ticket to the part, and then deliver it to the appropriate packing station.

A total of 313 employees participated in the Time 1 data collection. These respondents had an average age of 45 years, and 58% (181) of the sample was male. A total of 79 employees completed the survey at Time 2. Of those, 57 (72%) were male, and the average age was 46 years.

Measures

Cognitive ability. Cognitive ability was measured as a composite of four separate ability tests. Three tests (Reading Comprehension, Number Operations, and Problem Solving) were taken from the Adult Basic Learning Exam (ABLE) Level 3 (Karlsen & Gardner, 1986a). The ABLE norm booklet (Karlsen & Gardner, 1986b) indicates that the coefficient alpha reliability estimates

for these three tests are .87 for Reading Comprehension, .87 for Number Operations, and .90 for Problem Solving.

In addition, the Wonderlic Personnel Test (Form A) (E.F. Wonderlic and Associates, 1981;1983) was administered. This test has been used extensively as a measure of cognitive ability (Guion, 1965; Stone, Stone, & Guetal, 1990).

Scores from each of the four tests were first converted to standardized Z-scores, and then summed to form a composite measure of cognitive ability. The coefficient alpha reliability estimate of this four-item composite was .89.

Self-esteem. Self-esteem was measured with the 20-item Janis-Field scale (Eagly, 1957). Respondents indicated their agreement with each item on a 1 (strongly disagree) to 5 (strongly agree) Likert-type scale. This scale taps how competent the individual views himself or herself and to what degree he or she has a positive self-image. The internal reliability estimate for this scale was .86.

Motivation for training. To measure the extent to which the respondents wanted to participate in and felt they could gain something from the training sessions, the 17-item motivation for training scale was used (Noe & Wilk, 1993). This scale was completed only at Time 1. The Cronbach alpha internal reliability coefficient was .77.

Attitude toward education. Three items were used to measure the respondent's attitude toward education (Noe & Wilk, 1993). A sample item is "In general, I value education." The internal consistency estimate for this scale was .82. This measure was only administered at Time 1.

Organizational commitment. Organizational commitment, or the degree to which an individual believes in the goals of the organization and wants to see the organization succeed, was measured using the Organizational Commitment Questionnaire (Mowday, Steers, & Porter, 1979). This measure was used at both data collection points and produced an internal reliability coefficient of .99 for each administration.

Job satisfaction. Job satisfaction was measured using the Minnesota Satisfaction Questionnaire (Weiss, Dawis, England, & Lofquist, 1967) at both Time 1 and Time 2. This scale consists of 20-items that tap a variety of facets of job satisfaction. The Cronbach alpha for this scale was .85 for Time 1 and .90 for Time 2.

Intent to turnover. To measure the extent to which the respondents were contemplating leaving the organization, intent to turnover was measured using an 8-item scale that measures withdrawal cognitions (Hom & Griffeth, 1991). A sample item was "There are employment opportunities available to me that are at least as good as my current job." This measure was collected at both data collection times. The internal reliability coefficient alpha was .99 for Time 1 and .77 for Time 2.

Performance. The employees' performance was measured with a 10-item scale completed by the supervisors. The supervisors were asked to indicate their agreement with each of the items on a 7-point Likert type scale ranging from strongly disagree to strongly agree. Example items from this scale were "This subordinate always gets things done on time," "I never have to check up on this subordinate," and "This subordinate gets along well with co-workers." The coefficient alpha reliability estimate for this scale was .88 for Time 1 and .98 for Time 2.

Procedure

Time 1. The researchers visited the job site to administer a skills assessment aimed at determining whether or not the employees possessed the requisite skills needed to perform well in the automation training classes. The research questionnaire used for the present study was administered at the end of the assessment. Respondents were told that if they completed it and returned it directly to the researchers in the postage paid envelope provided they would be paid $10.00 for their time.

Following the administration of the assessment, the supervisors were assembled and given the performance evaluation scales to complete. The purpose of the study was explained to them,

and it was emphasized that these evaluations would never be seen by the employees, nor by anyone employed by the company. They were asked to complete the scales over the following week and mail them directly to the researchers. Within three weeks, all of the performance evaluations had been returned.

Time 2. The training intervention began approximately three to four months after the Time 1 data was collected. The training classes lasted for approximately 6 months with each employee attending, on average, two to three classes per month. Three to four months after the training programs ended, Time 2 data was collected. To accomplish this, the researchers sent a letter to each employee that was delivered with his or her weekly paycheck. The letter indicated that the researchers would be on site to pass out a second survey to all interested parties. The letter went on to say that if they completed and returned the survey they would earn $10.00.

Each survey was enclosed in a self-addressed, stamped return envelope that had the respondent's name in the return address portion of the envelope. The employees were met at the time clock on the date mentioned in the letter and were asked if they would like a survey. Only those who expressed a willingness to complete the survey were given a packet.

Once again, each supervisor was given a performance appraisal form for each of the employees they directly supervised. They were given instructions on how to complete the forms and were provided self-addressed, stamped envelopes to be used to return the forms.

Analyses

Hierarchical regression analyses (Cohen & Cohen, 1983) were used to analyze the data collected. The dependent variables of interest included job satisfaction, organizational commitment, intent to leave, and performance. A separate regression equation was run for each dependent variable. To analyze the influence of the remaining variables on these outcomes, the responses from Time 1 for each dependent variable were entered first, as a control variable. Following this step, training motivation and attitude toward education were entered. Next,

cognitive ability and self-esteem were entered. Finally, the interactions between cognitive ability and self-esteem and motivation for training and attitude toward education were entered.

Results

The intercorrelations, means, and standard deviations for the variables of interest are presented in Table 1 (please see page 15). As can be seen, not all of the variables collected at both Time 1 and Time 2 are significantly related to one another. Furthermore, the individual difference variables (i.e., cognitive ability, self-esteem, motivation for training, and attitude toward education) are only related to the dependent variables collected at time 1.

Organizational Outcomes

Results from the hierarchal regression equation for job satisfaction are presented in Table 2. Using job satisfaction at Time 2 as the dependent variable, job satisfaction at Time 1 was

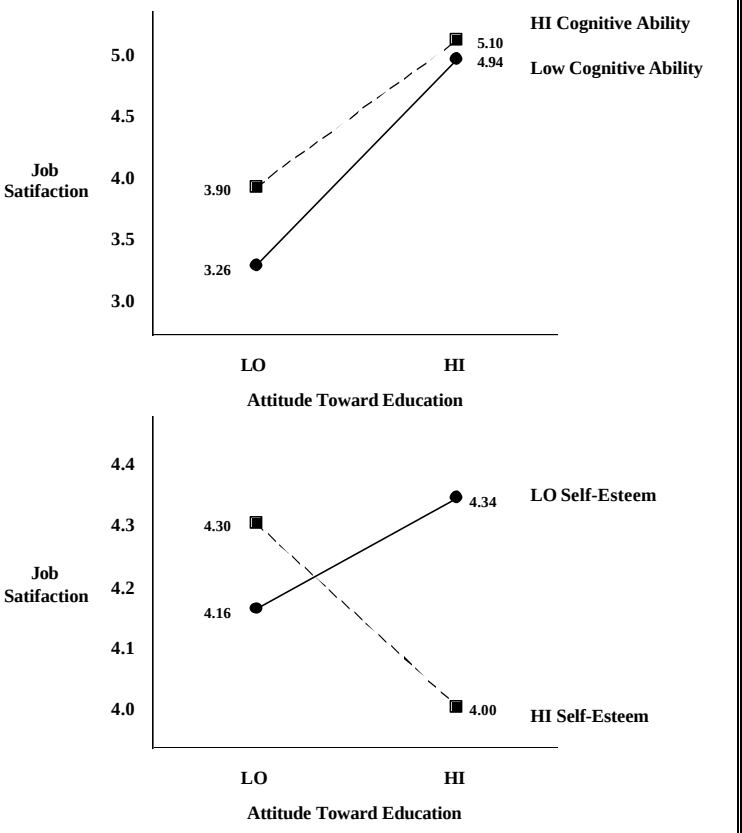
Table 2
Regression Results for Job Satisfaction Time 2

Step	Variable	R^2	R^2Change	B-Weight
1	Satisfaction Time 1	.24**	.24**	-.43**
2	Attitude toward education	.24**	.005	1.14*
	Training motivation			.08
3	Cognitive ability	.24**	.003	.82*
	Self-esteem			.71*
4	Attitude*Cognitive	.38**	.14**	-.25*
	Train*Cognitive			-.13
	Attitude*Self-esteem			-.32*
			Constant	1.72

Note. * = p < .05. ** = p < .01.

entered as a control variable. Results indicated that approximately 24% of the variance in satisfaction at Time 2 was explained by satisfaction at Time 1. Next, motivation for training and attitude toward education were entered, however, the results were not significant (Fstep < 1). Cognitive ability and self-esteem were entered in the next step, but once again, the results were not significant (Fstep < 1). In the final step, the interactions (i.e., attitude toward education * cognitive ability, attitude toward training * self-esteem, and motivation for training * cognitive ability) were entered. Results for this step were significant (Fstep = 4.70, p < .01), and are graphed in Figure 1. Similar analyses were run for each of the other dependent variables: intent to turnover, organizational commitment, and performance. However, none of the results were significant.

Figure 1



Discussion

The present study examined the contention that ability and motivation would impact organizational outcomes through the socialization process operationalized as training. To test this assumption, data were collected at two points in time: prior to and after automation training took place. Results indicated that this prediction only held for the organizational outcome of job satisfaction. Specifically, attitude towards education, cognitive ability, and self-esteem

individually as well as in concert with one another significantly impacted an individual's reported level of job satisfaction.

The interaction between attitude toward education and cognitive ability indicated that although attitude toward education was positively related to job satisfaction, the relationship was stronger for those low, relative to high, in cognitive ability. This stemmed from the fact that the lowest job satisfaction was expressed by those low in both cognitive ability and in their attitude toward education.

These significant findings may suggest that individuals who have the ability (high cognitive ability) and the motivation (positive attitude toward training) may view training as something from which they can benefit. In essence, since the organization is supplying them with an opportunity to grow, and because they are equipped with tools they need to succeed, they are satisfied with their situation. However, individuals who do not have the ability and dislike educational opportunities may be frustrated by having to attend and participate in training programs because they realize that this opportunity is not something upon which they can capitalize. Instead, it is frustrating and humiliating and decreases their satisfaction with their job.

The interaction between attitude toward education and self-esteem is somewhat counter to expectations. It indicated that one's attitude toward education is negatively related to job satisfaction for those high in self-esteem. This may be a function of the nature of the technological change, which was in large part, aimed at deskilling the job overall. Thus, as a result of the training, those high in self-esteem and having a positive attitude toward education might have perceived the job as being less congruent with their self image.

From an application perspective, these findings further reinforce the suggestion made by Fleishman and Mumford (1989), that it is up to the organization to select individuals for training who are capable of learning the required material. Selecting individuals who will not benefit from training wastes both time and money. Further, it highlights the need to recognize that not

all individuals will be receptive to training, and that other alternative measures of socialization maybe required to fully integrate all employees into the new automated system.

There are a number of possible explanations for the insignificant results for the remaining outcome variables. First, our performance variable was subjective in nature (i.e., supervisor's ratings). The results we found may simply have been telling us that subjective ratings contain bias. That is, the supervisors may have rated their workers the same way in both data collection periods regardless of their actual performance. A more objective measure of performance would be optimal. This contention can be tested in future analyses because the new automated system will be able to generate an individual performance report for each worker using the system. This record, compared to a supervisor's rating will clearly indicate whether bias is inherent in the performance ratings.

The results with respect to turnover were not unexpected. The town in which the warehouse is located is very small. Generations of families have and continue to work in the plant. There are reactively few other jobs available in the area, and none as good as the jobs they currently hold. Hence, intent to turnover is not a relevant construct for the current sample. Finally, organizational commitment may be too macro of a variable to be measured with individual level results. Job satisfaction, on the other hand, is more individual in nature and significant results were found for this variable. Perhaps other individual oriented outcome variables would have shown similar results.

As with any empirical study, there are strengths and limitations which need to be discussed. With respect to the strengths, the design used was a longitudinal one. Virtually every correlational study performed suggests that the question could be better addressed through a longitudinal design. Hence, this study answers that call. Also, this study focused on a real world problem: socializing current employees into new jobs. With the almost constant restructuring occurring in corporate American today, this issue is highly relevant to both researchers and practitioners.

Among the limitations of the present study is the fact that when the second round of data was collected, the technological intervention was not implemented. Hence, we cannot place much weight on the present results, however, a third round of data collection is planned to collect post-automation reactions. Further, as is a problem with most longitudinal designs, respondent mortality appears to be a limitation. Every effort will be made to increase the response rate in the third round of data collection to alleviate this problem in the future.

The findings from this study suggest several possible avenues for future research. First, researchers should attempt to locate outcome variables that may be more individual in nature. Because the outcomes of the training programs are individualistic, this type of variable may more closely tap the relationships of interest. Also, other types of socialization that can be used to introduce a technological change, besides training, should be examined. Results from the present study coupled with results from the studies suggested above, should provide a more holistic perspective of the impact of socialization on technological interventions.

Table 1

Intercorrelations, Means, and Standard Deviations for the Variables of Interest

Variable	M	SD	N	1	2	3	4	5	6	7	8	9	10	11	12
1. Job satisfaction - Time 1	2.61	.53	287	-											
2. Job satisfaction - Time 2	3.41	.54	77	-.49**	-										
3. Commitment - Time 1	6.54	2.44	326	-.07	.27*	-									
4. Commitment - Time 2	4.33	2.02	75	-.26*	.59**	.30**	-								
5. Intent to leave - Time 1		5.63	3.38	326	.01	.19	.97**	.22	-						
6. Intent to leave - Time 2		2.12	.70	77	.29*	-.34**	-.13	-.19	-.01	-					
7. Performance - Time 1	4.05	.62	242	-.31**	.33*	.07	.27*	.01	-.13	-					
8. Performance - Time 2	3.99	.73	35	.02	.29	-.01	.28	-.15	.09	.22	-				
9. Cognitive ability		.02	.85	313	.05	-.03	-.24**	-.05	-.23**	.11	.11	.27	-		
10. Self-esteem		3.71	.58	311	-.16**	.11	-.05	.13	-.09	.08	-.02	.04	.13*	-	
11. Training motivation	2.21	.45	298	.34**	-.10	.06	-.20	.09	-.04	-.10	-.03.	-.13*	-.31**	-	
12. Attitude toward education		2.25	.65	312	.12*	-.03	.12*	.09	.13*	-.02	-.06	-.29	-.35**	-.33**	.34**

Note. * = p < .05. ** = p < .01.

REFERENCES

Cascio, W.F., & Zammuto, R.F. (1987). *Societal trends and staffing policies*. Denver: University of Colorado Press.

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Dickerson, M.D., & Gentry, J.W. (1983). Characteristics of adopters and non-adopters of home computers. *Journal of Consumer Research, 10*, 225-235.

Eagly, A.H. (1957). Involvement as a determinant of response to favorable ad unfavorable information. *Journal of Personality and Social Psychology, 7*, 640-645.

E.F. Wonderlic and Associates (1981). *Wonderlic Personnel Test (Rev.)*. Northfield, IL: Author.

E.F. Wonderlic and Associates (1983). *Wonderlic Personnel Test Manual*. Northfield, IL: Author.

Feldman, D.C. (1989). Socialization, resocialization, and training: Reframing the research agenda. In I. Goldstein (Ed.), *Training and development in work organizations: Frontiers of industrial and organizational psychology* (pp. 376-416). San Francisco: Jossey-Bass.

Fleishman, E.A., & Mumford, M.D. (1989). Individual attributes and training performance. In I. Goldstein (Ed.), *Training and development in work organizations: Frontiers of industrial and organizational psychology* (pp. 183-255). San Francisco: Jossey-Bass.

Gist, M.E., Schwoerer, C., & Rosen, B. (1989). Effects of alternative training methods on self-efficacy and performance in computer software training. *Journal of Applied Psychology, 74*, 884-891.

Goldstein, I.L. (1991). Training in work organizations. In M.D. Dunnette, & L.M. Hough (Eds.), *Handbook of Industrial & Organizational Psychology* (2nd ed.) (Vol. 2, pp. 507-619.

Goldstein, I.L. (1989). Critical training issues: Past, present, and future. In I. Goldstein (Ed.), *Training and development in work organizations: Frontiers of industrial and organizational psychology* (pp. 1-21). San Francisco: Jossey-Bass.

Guion, R.M. (1965). *Personnel testing*. New York: McGraw Hill.

Hill, T., Smith, N.D., & Mann, M.F. (1987). Role of efficacy expectations in predicting the decision to use advanced technologies: The case of computers. *Journal of Applied Psychology*, *72*, 307-313.

Hirschman, E.C. (1980). Innovativeness, novelty seeking, and consumer creativity. *Journal of Consumer Research*, *7*, 283-295.

Hom, P.W. & Griffeth, R.W. (1991). Structural equations modeling test of a turnover theory: Cross-sectional and longitudinal analyses. *Journal of Applied Psychology*, *76*, 350-366.

Howell, W.C., & Cooke, N.J. (1989). Training the human information processor: A review of cognitive models. In I. Goldstein (Ed.), *Training and development in work organizations: Frontiers of industrial and organizational psychology* (pp. 121-182). San Francisco: Jossey-Bass.

Hunter, J.E. (1986). Cognitive ability, cognitive aptitudes, job knowledge and job performance. *Journal of Vocational Behavior*, *9*, 340-362.

Jensen, A.R. (1984). Test validity: "g" versus the specificity doctrine. *Journal of Social and Biological Structures*, *7*, 93-118.

Kanfer, R., & Ackerman, P.L. (1989). Motivation and cognitive abilities: An Integrative/aptitude-treatment interaction approach to skill acquisition. *Journal of Applied Psychology, 74*, 657-690.

Karlsen, B., & Gardner, E.F. (1986a). *Adult Basic Learning Examination*. San Antonio, TX: The Psychological Corporation.

Karlsen, B., & Gardner, E.F. (1986b). *Adult Basic Learning Examination: Norms Booklet*. San Antonio, TX: The Psychological Corporation.

LaBay, D.G., & Kinnear, T.C. (1981). Exploring the consumer decision process in the adoption of solar energy systems. *Journal of Consumer Research*, *8*, 271-278.

London, M., & Bassman, E. (1989). Retraining midcareer workers for the future workplace. In I. Goldstein (Ed.), *Training and development in work organizations: Frontiers of industrial and organizational psychology* (pp. 333- 375). San Francisco: Jossey-Bass.

Mowday, R.T., Steers, R.M., & Porter, L.W (1979). The measures of organizational commitment. *Journal of Vocational Behavior*, *14*, 225-232.

Noe, R.A., & Schmitt, N. (1986). The influence of trainee attitudes on training effectiveness: Test of a model. *Personnel Psychology*, *39*, 497-523.

Noe, R.A., & Wilk, S.L. (1993). Investigation of the factors that influence employees' participation in development activities. *Journal of Applied Psychology*, *78*, 291-302.

Stone, E.F., Stone, D.L., & Guetal, H.G. (1990). Influence of cognitive ability on responses to questionnaire measures: Measurement precision and missing response problem. *Journal of Applied Psychology, 75*, 418-427.

Thorndike, R.L. (1985). The central role of general ability in prediction. *Multivariate Behavior Research, 20*, 241-254.

Vroom, V.H. (1964). *Work and Motivation*. New York: Wiley.

Weiss, D.J., Dawis, R.V., England, G.W., & Lofquist, L.H. (1967). *Manual for the Minnesota Satisfaction Questionnaire*. Minnesota Studies in Vocational Rehabilitation, Vol. 22, University of Minnesota Industrial Relations Center, Minneapolis.