

Public sector training participation: an empirical investigation

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This study tests a mediated model of employee participation in training activities in a public sector highway department. Results showed the combined predictor sets accounted for a significant proportion of the variance in an objective measure of training attended, a self-report measure of training attended, and intentions to participate in future training. Although the proposed mediated model was not supported, the findings suggest that previous transfer success and motivation play a significant role in intentions to participate in training.

Introduction

Participation in learning, training, and other developmental activities is a major strategy for employee and organisational growth. For example, notions of continuous learning and lifelong learning stress individual responsibility and ongoing, active pursuit of learning as a means of career and personal development (Rosow and Zager, 1988). Organisations increasingly use learning to meet the adaptive demands of a dynamic environment. Interest in learning and training is reflected in literature addressing 'learning organisations' (Pearn, Roderick and Mulrooney, 1995) as well as rising investments in training, estimated at over \$60 billion in 1998 (Lakewood Research, 1998). In addition, research suggests an organisation's ability to learn is directly proportional to the degree to which employees themselves are willing and able to learn, change, and succeed at work (Bartel and Lichtenberg, 1987; Cohen and Levinthal, 1990). Although training is sometimes mandated to meet a variety of certification or regulatory requirements, involvement in most organisational learning and training activities is primarily a result of individual employee initiative (Noe, 1999). For these reasons, it is critical that HRD researchers and practitioners understand the individual and organisational factors that influence training participation.

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Relatively little research has investigated antecedents of continuous learning and participation in training or other developmental activities. Past research indicated variables such as exchange of information, complexity of task assignments, perceived task uncertainty, and managerial support for development are associated with technical updating orientation (Kozlowski and Hults, 1987; Kozlowski and Farr, 1988). More recent research has shown efficacy beliefs about personal skills and abilities, motivation to learn, perceived need for improvement, and social support have been found to be associated with participation in training (Maurer and Tarulli, 1994; Noe and Wilk, 1993). Research also suggests that organisational membership characteristics are related to level of training participation. For example, level of training participation has been found to vary as a function of job level (lower job levels receive less training), job tenure and age (increases in each is associated with less training participation) (Cleveland and Shore, 1992), and gender (Carnevale, Gainer and Villet, 1991).

This study seeks to extend current training participation research in three key ways. First, most previous research in this area has focused on technical updating activity of professional employees (i.e., engineers) in private sector organisations. This research examines training participation among highway construction workers and supervisors in the public sector.

Second, this research re-examines Noe and Wilk's (1993) proposed mediated model of training participation with several previously unexplored antecedent measures and several new motivational factors. The model (see Figure 1) proposes that workplace literacy skills, perceptions of continuous learning culture, an individual's previous success applying learning on the job, and organisational staffing strategy directly influence motivation and expectancy beliefs about training which, in turn, influence level of training participation. Job group is shown having a direct influence on training participation.

A third unique feature of this study is the focus on the role of expectancy beliefs as mediators of training participation. Expectancy theory may provide a useful framework for understanding training participation to the extent that individual beliefs about the value and instrumentality of training influence training attendance and effort.

Antecedents to training-related motivation

Basic workplace skills

The model examines the role that basic workplace literacy skills play in training participation. Basic workplace literacy skills are those skills individuals need to effectively respond to the literacy demands of the workplace (Gowen, 1992). They are the basic skills needed by employees to successfully perform job duties, learn, and apply learning on the job, and include skills such as reading, writing, mathematics, and listening (Department of Labor, 1991).

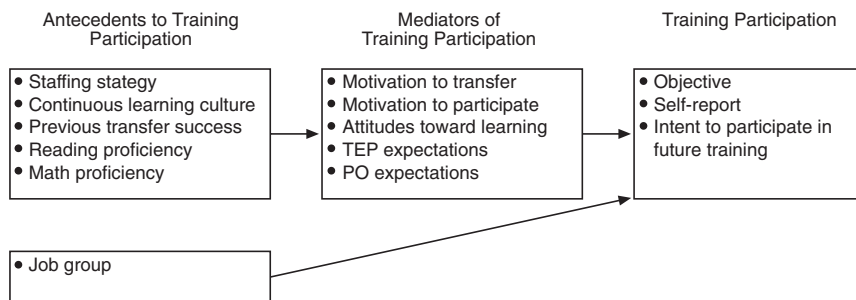


Figure 1: Conceptual model of training participation

Although research has not yet examined the relationship between basic workplace literacy skills, training participation and related attitudes, understanding these issues is important for several reasons. First, the extent of the basic skill gap in the United States has made the issue of workplace literacy a critical one. It is estimated that 10 per cent of US workers are functionally or marginally illiterate (Lund and McGuire, 1991); one in five lack the literacy skills needed to function effectively in work or life (Knell, 1990); and nearly half of all Americans have literacy levels well below what is needed to be competitive in today's economy (National Educational Goals Panel, 1994). Second, low basic skill levels could undermine the adaptive capabilities of organisations through their influence on training participation and attitudes. For example, employees who do not have the basic literacy skills required by their jobs may purposefully avoid participation in training as a strategy to conceal this weakness. When low workplace literacy skills inhibit training participation, they present a barrier to an individual's capacity to use training to improve work performance. McEnrue (1989), for example, suggests individuals must feel capable of mastering the content of a training program before they will participate in that training. From this perspective, individuals with job-proficient levels of basic skills would be more apt to participate in training than those without such skills. It is also possible that basic skill deficits constrain an individual's ability to profit from training. For example, low basic skill levels may inhibit an individual's readiness to learn in training, expectations about training and its performance improvement value, or confidence and ability to apply new learning on the job.

Understanding the nature of the relationship between basic skills and training participation could facilitate the development of strategies that organisations facing literacy challenges could use to enhance the pay-off from learning and training. For instance, research may point to the value of profiling jobs, testing, and, where necessary, enhancing the workplace literacy skills of workers prior to investing in the development of job-related training. This is particularly important given recent data indicating the employees with the less than high school education are only about half as likely to receive organisation-sponsored training as those with high school diplomas (American Society for Training and Development, 1999).

Continuous learning culture

Although research suggests that several specific dimensions of the development climate can affect competence and performance via their influence on employee participation in development activities (Kozlowski and Hults, 1987), research has not yet examined the influence of more macro-level variables such as an organisation's continuous learning culture on developmental participation. A continuous learning culture reflects an organisational belief system that regards learning as a key responsibility of all employees, and which values and supports learning and its job application through formal and informal systems (Tracy, Tannenbaum and Kavanaugh, 1995). When these values are widely shared throughout an organisation, they have the capacity to influence training participation, perceptions that training will lead to improved competence, and that improved competence will produce outcomes that are desirable (e.g., salary increases) (Farr and Middlebrooks, 1990).

Staffing strategy

Organisations typically have two ways to meet their human resource development demands: they can access the external labor market and hire new employees who have the needed skills, or they can develop the skills and abilities of employees selected from the internal labor pool (Miles and Snow, 1980). Employee training attitudes and activity may be influenced by the extent to which they perceive their employer relies on one or the other of these approaches (Noe and Wilk, 1993). Thus, employees in organisations that tend to promote from within rather than recruit from outside the organisation may receive more training opportunities, view training

participation as an important vehicle for attaining valued outcomes (e.g., promotion), and consequently be more motivated to participate in and use training to improve work performance. Although staffing strategy has not been examined in previous employee development research, at least one study has indicated that employees' perception of organisational policies regarding employee development is related to past development activity (Maurer and Tarulli, 1994).

Previous transfer success

Expectancy theory recognises that previous reinforcement can affect an individual's perceptions that future efforts will lead to desirable outcomes and that those outcomes will be rewarded (Staw, 1984). One of the linkages that may be important in this regard is an individual's previous success in applying new learning on the job. If an individual has been successful in the past at mastering training content, applying that learning on the job, and receiving valued rewards for that application, it is likely that these experiences will foster positive perceptions about future efforts. Campbell (1989) believes that the training-related histories of individuals act to create attitudes, values and behaviors that can influence future training experiences. This reasoning suggests that past learning transfer success could enhance positive expectations about the outcomes of future training, increase training-related motivation, and lead to increased levels of training participation.

Motivational factors influencing training participation

Motivational factors are among the most efficient predictors of training-related performance. Research indicates motivation is positively associated with learning (Hicks and Klimoski, 1987; Mathieu, Tannenbaum and Salas, 1992), program completion, (Baldwin, Magjuka and Loher, 1991), training attendance (Fishbein and Stassen, 1990), and beliefs that training is appropriate and will improve job performance (Clark, Dobbins and Ladd, 1993; Seyler *et al.*, 1998). There is also evidence that participation in employee development activities is positively associated with higher motivation to learn and transfer learning to the job (Noe and Wilk, 1993), and that both motivation to learn and to transfer need to be addressed to fully capture the motivational factors associated with training participation (Noe and Wilk, 1993; Tharenou, 1997). The present study views motivation to participate as a function of the combined influence of employee attitudes about learning, willingness to complete learning tasks, expectations about the outcomes of training and its job application, and motivation to utilise learning at work that influence training participation. Employees with positive attitudes about learning and learning tasks, high expectations about the value of learning and its outcomes, and motivation to apply that learning will participate in relatively more training experiences.

Attitudes toward learning

Employees' general attitudes toward training experiences can have a substantial influence on their success and participation level. When individuals can see the relationship between learning in training and work goals, they will be more interested in learning, more willing to attend training, and more likely to learn and use that learning. The value that employees place on learning as a developmental tool can therefore influence the level of training participation. Although this specific attitudinal measure has not been previously examined as a factor in training and development participation, similar factors have been studied (Noe and Wilk, 1993; Maurer and Tarulli, 1994) but the effects have not been consistent.

Motivation to participate in training

It is possible to have positive attitudes about training but still not be motivated enough to attend training sessions. An employee may feel there is work that needs to be done that takes precedence over training, or that acquiring new learning is an additional and inconvenient stress. A complete picture of motivation to participate must therefore assess the degree to which an individual accepts responsibility for attending training sessions and learning the material presented. Individuals who are motivated to participate in training value training more highly and are committed to participating fully when given the opportunity to do so.

Motivation to transfer

Motivation to transfer refers to the intensity and persistence of effort directed toward the job application of skills and knowledge learned in training (Seyler *et al.*, 1998). When motivation to transfer is high, individuals see value in learning, are more apt to apply that learning, and believe that transferring learning will improve job performance (Bates and Holton, 1999). Employees that hold these beliefs are more likely to participate in organisation-sponsored training.

Expectancy beliefs

Expectancy theory is a decision theory of motivation and choice. It is based on three key mental components: value, instrumentality, and expectancy. This perspective views motivation and behavioral choices as a result of an individual's belief that certain behaviors will lead to valued outcomes (value and instrumentality), and that attaining those outcomes is possible (expectancy) (Lawler, 1971). Accordingly, participation in training is seen as a function of employees' belief about the value of training outcomes, that effort devoted to learning will lead to other outcomes (effort-performance expectations), and their belief that attaining a certain outcome as a result of training participation is possible (performance-outcome expectations).

Methodology

Sample

Participants in this study were 1,079 individuals employed with a state highway/transportation department in the Southern USA. From this sample of respondents, 27 per cent ($n = 287$) provided complete data for all measures. Of the individuals that provided complete data, 15 per cent were mobile equipment operators ($n = 44$), 43 per cent were highway construction foreman ($n = 123$), 10 per cent were highway maintenance supervisors ($n = 28$), 11 per cent were entry-level highway technicians ($n = 31$), and 21 per cent were advanced highway technicians ($n = 61$). The sample was predominantly male ($n = 251$, 87.4 per cent). For consistency across analyses, only complete data sets were used in the regression analyses.

Procedure

The data in this study were collected as part of a larger project conducted to address a number of organisational issues including workplace literacy and training transfer problems. A needs assessment team under the direction of the researcher administered the two workplace literacy skill assessment instruments and a 120-item survey instrument, with the assistance of the organisation's District Training Specialists. Data collection was completed during the months of January and February 1999. Participants were selected by the organisation to attend the data collection sessions but could decline to complete the instruments if they so desired. Of the 1,218 individ-

uals selected to participate in the assessment, 1,079 (89 per cent) elected to respond to the instruments.

Antecedent measures

Data on work-related basic skill levels were assessed using two scales from the Work Keys® assessment system. Work Keys is a set of eight criterion-referenced basic skills assessment tests. The tests measure a variety of work-related cognitive and interpersonal skills against the proficiency required to successfully perform a specific job. The content of Work Keys assessments are built by defining a hierarchical skill scale for a specific job and then creating test items to be representative of both a skill area and the specific skill levels within that skill area. Required proficiency levels are established through job analysis. Job analysis is used to establish the content relatedness between a specific job and the existing Work Keys skill area and, if the job and skill are found to be content related, to establish the skill level required by the job (i.e., establish a skill standard for that job). Work Keys assessment tests have undergone extensive reliability and validity testing and have been widely used in education, business, and industry in the United States.

Job-related basic skill proficiency

Job-related basic skill proficiency was assessed along two dimensions. A *reading for information* assessment measured an individual's skill in reading and understanding work-related instructions and policies. Employees were tested on their ability to understand reading passages, based on actual demands of the workplace, that were in the form of memos, bulletins, notices, letters, policy manuals, and governmental regulations. An *applied mathematics* assessment measured an individual's skill in applying mathematical reasoning to work-related problems. The assessment required the examinee to set up and solve the types of problems and to do the types of calculations that actually occurred in his/her job. Examinees could use a calculator. A formula sheet was provided that included, but was not limited to, all required formulas. For both the reading and mathematics assessment, examinees were given 40 minutes to respond to 30 multiple-choice problems.

Required reading and math proficiency standards were identified for five job groupings in this organisation. Subject matter experts established the job groupings based on the similarity of tasks and required skills needed by the jobs in a particular group. Basic skill proficiency levels were determined based on comparisons with functionally similar job groups previously profiled by Work Keys. The job groupings and the proficiency levels required for each grouping are shown in Table 1. Because one focus of this study was to determine whether satisfactory proficiency levels of basic workplace literacy skills influenced motivation to participate in training, individual scores for the reading and math assessments were dummy-coded based on whether the individual met or did not meet the proficiency standard for his/her job.

Table 1: Required math and reading levels by job group

	Job group				
	1 Mobile Equip Operators	2 Highway Construction Foreman	3 Highway Maintenance Specialists	4 Highway Technician 1, 2	5 Highway Technician 3, 4, and Supervisors
Req'd math level	3	4	5	5	5
Req'd read level	4	4	4	5	6

Continuous learning culture

Continuous learning culture (Tracy *et al.*, 1995) is a construct that assesses the extent to which individuals perceive the work environment to be supportive of learning and the use of new knowledge. Continuous learning culture was assessed with a 15-item scale ($\alpha = .91$) developed by Tracy (1992). Sample items included 'Job assignments challenge employees to learn new things' and 'Co-workers are willing to listen to new ideas'. The means, coefficients alpha, standard deviations, and intercorrelations for all measures are shown in Table 2.

Staffing strategy

Employees who believe their organisation values expertise and prefers to develop and promote expertise from within rather than recruit it outside the organisation will likely exhibit higher levels of motivation to participate in training. A 4-item scale developed by the researcher assessed individual perceptions of organisational staffing strategy. Sample items included 'This organisation promotes from within rather than hiring new people from the outside' and 'In this organisation, higher level positions are filled by promotion from within the organisation'. Both this and the continuous learning culture scale were rated on a 5-point scale with anchors from (1) strongly disagree to (5) strongly agree.

Previous transfer success

Previous success at using new learning on the job can be expected to contribute to an individual's motivation to participate in subsequent training activities. The motivation value of previous transfer success will likely vary as a function of the immediacy and extent of that success: the more recent and extensive the success, the greater the motivation. The present study measured previous transfer success with a single item that asked respondents to estimate the percentage of learning from their last job-related training they were able to successfully apply on the job ('Overall, about what percentage of the learning you acquired in your last job-related training have you been able to successfully apply on the job?'). Respondents were given a blank space on the questionnaire and asked to make their best estimate.

Mediator measures

This study tests the notion that employee participation in training is directly influenced by employees' attitudes toward learning, willingness to complete learning tasks, expectations about the outcomes of training and its job application, and motivation to utilise learning at work. Five scales were used to assess these dimensions of training-related motivation. All scales used a 5-point response scale with anchors from (1) strongly disagree to (5) strongly agree.

Attitude toward learning and motivation to participate in training

These two scales were taken from the Strategic Assessment of Readiness for Training (START) instrument (Weinstein *et al.*, 1994). The START instrument consists of eight 7-item scales designed to provide a diagnostic assessment of learning strengths and weaknesses in a work setting; to provide baseline data about readiness to profit from training or other learning experiences; and to increase an individual's awareness of strategic learning strengths and weaknesses. The *attitude toward training* scale indicates the value or importance individuals placed on participation in training for personal or professional development (e.g., 'I enjoy training programs that help me to develop knowledge and skills that will be useful in my work'). The *motivation to participate in training* assesses the degree to which individuals are willing to partici-

Table 2: Cronbach's alpha, means, standard deviations and intercorrelations

Variable	α	\bar{x}	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Job Group	–	–	–	–													
2 Courses	–	8.56	7.80	–.04	–												
3 Self-Reported	–	10.80	11.77	–.25*	.16*	–											
4 Intend	–	11.68	12.42	–.34*	.14*	.64*	–										
5 Staff Strategy	.70	3.52	.61	–.18*	.04	.11*	.09	–									
6 Transfer Success	– [†]	2.64	1.33	–.03	.10	.17*	.14*	–.04	–								
7 Lrng Culture	.91	3.44	.63	–.08	.07	.05	–.05	.13*	.31*	–							
8 Math	.86	.64	.48	–.69*	.11*	.14*	.25*	.18*	.00	–.01	–						
9 Reading	.80	.65	.48	–.75*	.01	.06	.22*	.16*	–.05	.03	.72*	–					
10 Mot Partic	.65	3.77	.44	–.16*	.15*	.11*	.16*	.23*	.07	.15*	.17*	.21*	–				
11 Mot Trans	.80	3.66	.65	.00	.08	.11*	.16*	.05	.32*	.38*	–.06	–.07	.33*	–			
12 Att Learn	.78	3.64	.65	–.04	.08	.10*	.18*	.18*	.30*	.28*	.00	.06	.48*	.57*	–		
13 POE	.79	2.95	.79	–.03	.04	.04	.01	.15*	.23*	.35*	–.05	–.02	.08	.42*	.31*	–	
14 TEPE	.80	3.76	.58	–.03	.02	.07	.06	.13*	.37*	.51*	–.05	–.06	.031*	.61*	.53*	.52*	–

Notes: * $p < .05$ [†]Single item measure

pate in training and complete the tasks and work assigned to him/her (e.g., 'I try hard not to miss any of the sessions during a training program').

Expectancy beliefs

Expectancy beliefs about the instrumentality and outcomes of training were assessed with two scales taken from Learning Transfer Systems Inventory (LTSI) (Holton, Bates and Ruona, in press). This 68-item instrument was developed to measure factors affecting learning transfer in work settings. Exploratory factor analysis of the LTSI has revealed an exceptionally clean and interpretable sixteen-factor structure. The *transfer effort-performance expectations* scale is a 4-item scale that assessed the extent to which individuals believed that applying skills and knowledge learned in training would improve their performance. Sample items included 'My job performance improves when I use new things I have learned' and 'The harder I work at learning, the better I do my job'. The *performance-outcomes expectations* scale assessed the degree to which individuals believed that applying skills and knowledge learned in training would lead to recognition they value (e.g., 'When I do something to improve my performance, good things happen to me'). These two scales address expectancy beliefs about the capacity of training to improve performance and the likelihood that changes in performance will lead to outcomes valued by the individual.

Motivation to transfer learning

This measure was also taken from the LTSI (Holton *et al.*, in press). It is a 4-item scale designed to examine the degree to which individuals are motivated to utilise new learning on the job. Items included 'Training increases by personal productivity' and 'I get excited about using my new learning'.

This set of five measures expands a second-order construct, motivation to improve work through learning, posited to more completely capture training-related motivational influences (Naquin and Holton, 2000). As originally proposed, this construct was measured with four scales (attitude toward learning, motivation to participate, motivation to transfer, and performance-outcome expectations). The present study added a fifth scale (transfer effort-performance expectations) to more fully assess the role of training expectations in motivating training participation.

Control measures

Job group

As noted earlier, the subjects for this study were aggregated into five job groups based on the similarity of job tasks and required skills. Since the primary interest of this study was identifying the role of training-related motivation in mediating the influence of antecedents on training participation independent of job group, this variable was treated as a control and entered first in the regression equations.

Outcome measures

Three outcome measures were used in this study: an objective measure of training attended, a subjective measure of training attended, and a subjective measure of intentions to participate in training in the future. The objective measure reflected the number of organisation-sponsored training events that participants had attended in the 12 months between January 1 1999 and December 31 1999. Data for courses attended were generated from the organisation's training database. The subjective measure of training attended consisted of a single self-report item. Respondents were given a blank space on the questionnaire and asked to estimate the number of days

in the past 12 months they had spent in training. Similarly, a single-item self-report measure asked respondents to estimate the number of days of voluntary job-related training they intended to complete in the next 12 months ('How many days of job-related training do you intend to complete in the next 12 months, assuming the courses are available and the decision to attend is left completely up to you?'). Respondents were given a blank space on the questionnaire and asked to make their best estimate.

Analysis

Hierarchical regression analysis was used to determine whether the model provided a reasonable description of the relations among variables as specified. Analysis followed a procedure described by Cohen and Cohen (1983) and used in other development participation research (Noe and Wilk, 1993). This approach contrasted total effects, or the direct and independent proportion of variance accounted for by each predictor set, with unique effects, or the proportion of variance accounted for by the predictor set when the other sets were controlled. Direct relationships suggested by the model should produce significant total and unique effects. This would indicate that variance was not shared among predictors and therefore could not be mediated. Mediated relationships should show significant total effects but non-significant unique effects. Assessment of unique and total effects was based on an examination of R^2 values. Beta weights were examined to determine the contribution of individual variables within the predictor sets.

Results

Regression diagnostics

Consistent with observations that variables based on counts, such as number of courses attended, are prone to nonlinear relationships (Cohen and Cohen, 1983), diagnostic evaluation of the data revealed that the objective measure of courses attended was substantially nonlinear and heteroscedastic. These characteristics limit the ability of the correlation coefficient to represent relationships the offending variable has with other variables (Bobko, 1995). In order to create a more interpretable data structure, a logarithmic transformation was performed on this dependent variable.

Descriptive statistics

Means, standard deviations and intercorrelations of all variables are shown in Table 2. Examination of variable intercorrelations suggests several interesting patterns. First, the two-tailed correlations among variables were generally low, suggesting that the measures were assessing different constructs. Second, data showed that job group was negatively associated with all three outcome measures. This indicates that individuals in job groups requiring relatively lower levels of basic skill proficiency levels received more training, reported attending more training, and intended to participate in more training in the future. Third, job-proficient levels of math skills showed low but significant correlations with all three outcome measures. Fourth, job-proficient math and reading skill levels were associated with motivation to participate in training. Finally, the correlation between the objective measure of training participation and both self-report measures was low ($r = .18$ and $.19$, $p > .05$), while the correlation between self-reported participation and intentions to participate was substantially larger ($r = .64$, $p > .05$).

Regression results

Table 3 presents the hierarchical regression results for the total and unique effects of the predictor sets for all outcome variables. Results indicate that the combined effects of the antecedent and mediator variables explained a significant proportion of variance in all of the measures of training participation, with $R^2 = 12.9$ (objective measure), 16.5 (self-report), and 19.6 (intention to participate). For this data set, the model appears to be less effective in predicting past training as measured objectively through organisational records, and somewhat more effective in predicting self-report measures, particularly intentions to participate in future training. Overall, however, the model appears to account for a comparable amount of variance across all three dependent variables.

Model evaluation

It was suggested that the influence of the antecedent variables (continuous learning culture, staffing strategy, previous transfer success, and job-related math and reading proficiency) on training participation would be mediated by an individual's training-related motivation. A significant total effect for these factors on the outcome measures, but insignificant unique effects would confirm this hypothesis. As shown in Table 3, the antecedent measures showed a significant relationship with all the outcome measures, as well as significant unique effects. This suggests that there is no mediation involved in this relationship. On the other hand, a direct relationship between training-related motivation and participation in training is suggested for both the objective measure of courses attended and intentions to participate in future training. For these outcomes, motivation accounted for significant proportions of total and unique variance.

Although the mediated model was not supported, the predictor sets explained significant variance in all measures of training participation. With the control variable (job group), the combined antecedent measures had a significant total effect on all outcome measures, as did the combined motivation variables. Variance accounted for by the antecedent measures ranged from 8.8 per cent to 17.2 per cent and that for the motivation measures from 7.1 per cent to 15.4 per cent. On average, the antecedent variables accounted for slightly more variance across the outcome measures than did the motivation measures (average $R^2 = 13.8$ versus 10.8).

Examination of the results of the unique effects analysis indicated that continuous learning culture, staffing strategy, previous transfer success, and job-related reading

Table 3: Hierarchical regression results for total and unique effects

	N	R ²	Control ^c	A ^d + M ^e	R ² total ^a Control + A	Control + M	R ² unique ^b A	M
Courses	287	12.9*	3.0*	9.9*	8.8*	7.1*	6.5*	3.5*
Self-Report	287	16.5*	8.7*	7.8*	15.3*	9.8*	5.3*	1.9
Intend	287	19.6*	13.0*	6.6*	17.2*	15.4*	3.2*	3.0*

Notes:

* $p > .05$

^aEffects of other variable sets uncontrolled

^bEffects of other variable sets controlled

^cControl variable = job group

^dA = Antecedents (continuous learning culture, staffing strategy, previous transfer success, job-related reading and math proficiency)

^eM = Mediators (attitudes toward training, transfer effort-performance expectations, performance-outcomes expectations, motivation to transfer, motivation to participate in training)

and math proficiency explained an average of 5.0 per cent of the variance across outcome measures. This is slightly larger than that explained by attitudes toward training, motivation to participate in training, motivation to transfer, transfer effort-performance expectations, and performance-outcome expectations (average $R^2 = 2.8$).

Examination of beta weights (Table 4) in the unique and total effects equations provides a basis for examining the relative importance of the predictors and suggesting those that may be useful in future research. From this several important points emerge. First, as expected, job group was the only variable to have significant total and unique effects for all outcome measures. This result is consistent with previous research indicating organisational characteristics are relatively strong predictors of development activity. Second, the total and unique weights for previous transfer success were significant for self-reported training participation and intentions to participate in future training. The weights were relatively stable across the total and unique models suggesting this factor, previously unexamined in development participation research, may be important in stimulating training participation. Third, motivation to participate showed significant total and unique weights for the objective measure of courses attended, and motivation to transfer showed significant total and unique weights for intentions to participate. How-

Table 4: Beta weights for total and unique effects regression models

	Training participation		
	Courses attended	Self-report attended	Intent to participate in future training
Job group	-.26* (-.17*)	-.43* (-.30*)	-.40* (-.36*)
Previous transfer success	.11 (.11)	.14* (.16*)	.12* (.15*)
Staffing policy	.02 (.04)	.02 (.05)	.00 (.04)
Continuous learning culture	.06 (.08)	.00 (.00)	-.15* (-.09)
Math	.21* (.33*)	.10 (.09)	.09 (.07)
Reading	-.38* (-.23*)	-.30* (-.26*)	-.14 (-.13)
Motivation to transfer	.07 (.09)	.11 (.16*)	.15* (.15*)
Motivation to participate	.14* (.15*)	.10 (.05)	.07 (.03)
Attitudes toward learning	.05 (.02)	.01 (.05)	.05 (-.14*)
Transfer effort performance exp	-.21* (-.15)	-.09 (-.07)	-.06 (-.07)
Performance outcome exp	.03 (.05)	-.05 (-.06)	.01 (-.08)

Notes: Table displays the standardized regression coefficients (Beta weights) for the total effects, indicated first, and the unique effects shown in parentheses.

* $p > .05$

ever, neither these nor any of the other motivation factors showed a consistent relationship across outcome measures.

The results for the basic skill measures showed significant total and unique effects for the relationship between math skills and courses attended but not for self-reported training attended or intentions to participate. In addition, examination of the beta weights and correlation coefficients associated with reading skills showed some inconsistency. The simple correlations between reading skills and the three outcome measures were positive yet the beta weights for reading skills for all outcomes were negative. Although the negative beta weight for reading skills made the regression equation a significantly better predictor of each outcome measures, this finding is counterintuitive. It was assumed that individuals with adequate job-related basic skills would feel more capable of mastering the required learning and would therefore be more likely to participate in training. However, the negative beta weights imply that individuals with reading skills *below* that required for their jobs were more likely to participate in or intend to participate in training. These results confirm what most researchers concede: that situations in which the regression weight for a variable is different in nature from its simple correlation with a criterion measure are extremely difficult to interpret (Bobko, 1995). First, because all the intercorrelations in a regression model are used to calculate the regression weights, the number of predictors in this study would make it difficult to explain the results for reading skills in terms of every possible relationship with all the other predictors. Moreover, in the absence of strong theoretical rationale one way or the other for the reading skills results, it is perhaps most appropriate to consider these results to be a statistical artifact. Given the highly variable nature of beta weights, it is possible that in another sample the simple correlation and beta weight for reading skills would not show the inconsistency seen in this study.

Discussion

There is a general paucity of research examining variables related to employee participation in training. This study extends current research by confirming the importance of variables identified in previous work and suggesting the usefulness of previously unexamined ability and perceptual factors.

Although the results did not support the proposed model, both antecedent and motivational elements emerged as significant predictors for all measures of training participation. This study examined three perceptual antecedents to training-related motivation (staffing strategy, continuous learning culture, and previous transfer success) and two ability-related antecedents (job-related reading and math proficiency). Results showed these factors as a set were significant predictors of training participation.

Previous transfer success also made a significant positive contribution to the prediction of self-reported training attended and intentions to participate in future training. Although this construct has not appeared in any earlier research, the current findings support Campbell's (1989) notion that individual training histories generate attitudes, values and behaviors that can influence future training experiences. It appears that past learning transfer success enhances positive expectations about the outcomes of future training, increases training-related motivation, and leads to increased levels of training participation. The implication is that organisations interested in encouraging employee involvement in training as a means of improving performance should strongly consider establishing a work environment that supports employees' success in applying learning. This is consistent with considerable research into transfer climate (Bates *et al.*, 2000; Rouiller and Goldstein, 1993; Tracy *et al.*, 1995) and further suggests that training participation, transfer success, and performance improvement may have a mutually reinforcing relationship: training participation followed by transfer success and improvements in performance lead to further training participation.

Job-related basic skill proficiencies represent a set of variables that have not been

studied in previous research on training participation. This study examined the role of math and reading skills and, although these variables were not consistent predictors across regression models, they did show significant correlations with training participation as well as motivation to participate in training. These findings are important for two reasons. First, they suggest that adequate job-related workplace literacy skills may be important prerequisites for employee participation in training activities, and that employees who meet the workplace literacy requirements of their jobs may be more apt to participate in more training than do employees who do not. The implication is that organisations with relatively large numbers of low basic skill employees may find it difficult to use training as a performance improvement tool. Alternatively, individual difference elements such as these represent factors that are relatively open to organisational interventions. For example, adult basic skills programs, currently used by an estimated 15 per cent of US organisations (American Society for Training and Development, 1999), are accessible and relatively straightforward prerequisites that could be used to maximise the performance improvement benefits of job-related training.

The overall impact of the basic skill variables in this study were somewhat obscured by the inconsistent results with reading skills. Future research with this and other basic skill elements may further clarify the role and importance of these factors in training participation. Specifically, longitudinal research is needed to examine whether changes in literacy levels are associated with changes in training participation rates. Research should also address whether employees with satisfactory workplace literacy levels are more aware of their development needs than employees with unsatisfactory levels, and the extent to which workplace literacy levels affect participation in other types of development activities (e.g., career assessment and planning).

The motivational elements in this study showed significant total and unique effects on the prediction of training participation. However, none of the motivation measures were consistent and significant predictors across all measures of training participation. In particular, the expectancy-related motivation measures (transfer effort-performance expectations and performance-outcome expectations) showed virtually no relationship to any training participation measure. Extrinsic rewards (pay increases) for performance improvements are rare in the public sector. It may be that participants in this study did not perceive any extrinsic rewards for training participation and therefore did not place a high value on the outcomes of training. This interpretation emphasizes the notion that understanding employee values regarding training and the potential outcomes from training may be an important factor when implementing training programs (Maurer and Tarulli, 1994). To further our understanding of the role that motivation plays in training participation, it may be productive for future research to investigate the moderating effect of employee values on training participation and training-related motivation.

Finally, it is important to address the relatively low R^2 values generated from the regression models in this study. It is possible that the large sample size provided the statistical power to detect as significant the rather moderate effects shown for the regression models. With this observation, however, come two important caveats. First, it should be noted that the level of variance accounted for in training participation in this study is not inconsistent with studies of training participation in other organisations (Noe and Wilk, 1993). Second, it is possible that the moderate R^2 values in this study were a consequence of organisational demands regarding training. Because a large proportion of the training done in this organisation was mandated to meet state and federal certification requirements, employees may have developed the view that training participation in general is largely non-voluntary. It would therefore be logical to find that regression models intended to explain the variance in voluntary training participation were only modestly successful at doing so because of the training-related schema held by employees. This same reasoning may also partially explain the lack of correlation between the objective measure of training participation and the self-report measure. The former tapped all training (voluntary

and mandated) while the latter only tapped participation in programs that were perceived as voluntary. In any case, these considerations underscore the need for further research in a variety of settings examining the role of these variables in predicting training participation.

Limitations

There are several limitations in this study that deserve mention. First, aside from the objective measure of training participation, this study relied on self-report and survey data collected at a single point in time. Although the correlation matrix indicated a wide range of correlations, most generally consistent with expectations, method variance could have affected the observed relationships in unknown ways. In addition, the self-report data were useful in this study because they provided information about individual perceptions of intent to participate in future training. They also provided a check on the objective measure of training participation provided by the organisation. Interestingly, the relatively low level of convergence between the objective and self-report measures of participation noted above is consistent with other research (Campion, 1991) that has generated the observation that organisational data may not be the most reliable indicator of development activity (Noe and Wilk, 1993). This suggests that collecting data about employee participation in development activities from multiple sources may be important in this kind of research.

Second, this study measured a very narrow range of development activity (i.e., training participation). Consequently it is difficult to generalize the findings to other kinds of development experiences (e.g., career counseling, career planning, non-job-specific training, and so on). Future research examining models of development participation should include a broader range of activities to enhance external validity.

This study included only a small subset of factors that could potentially influence training participation. Future research should re-examine some of the factors that did not emerge as significant in this study. Since climate variables have been shown to be important constraints or supports for participation, continuous learning culture and staffing strategy may be worthy of additional research attention. Future research utilising an expectancy framework may want to compare the relative effects of intrinsic versus extrinsic rewards on developmental participation to determine whether the primary source of motivation to participate is internal or external.

In addition, future research should consider going beyond testing normative models. In general, these models have explained only a modest proportion of the variance in developmental participation. One promising avenue may be to investigate the cognitive processing that individuals go through in making the decision to participate in developmental activities. Since participation in such activities is a result of conscious decision-making, it is subject to a variety of cognitive heuristics that have yet to be explored. For example, we know little about how individuals screen and make choices about different development activities, the schemas individuals use to make these choices, or how the decision to participate in development activities becomes cognitively scripted in ways that lead to participation that is less dependent on external rewards, instigation, or mandates. In today's high stress workplace individuals can certainly be expected to screen developmental options and assess potential rewards. Research designed to explicate the decision-making process and the parameters involved in this process would increase our understanding of developmental participation.

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