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ABSTRACT

This document contains three papers on transfer of training and human resources. "The Effect of Organizational Support, Management Support, and Peer Support on Transfer of Training" (Susan E. Cromwell, Judith A. Kolb) reports on a longitudinal study of work environment factors that affect transfer of training in a university supervisory skills training program. The findings indicate there is a positive correlation between management support and transfer of knowledge and skills. "The Impact of Workplace Design on Training Transfer" (Virginia W. Kupritz, Tharulatha Y. Reddy) reports on a study of office workers' transfer of training and where environment fits in with other organizational factors impacting that transfer. (Frequencies were highest for workplace design perceived to impede transfer and second highest for workplace design perceived to facilitate transfer.) "Transfer of Learning: How Managers Develop Proficiency" (Michael D. Enos, Marijke Kehrhahn) reports on the link between corporate managers' proficiency and transfer of training learnt mostly through informal means. (The study revealed that work environment does not affect transfer of learning nor are skills learned informally more readily transferred.) A model of managerial proficiency was developed from the findings. All three papers contain substantial bibliographies.(AJ)

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The Effect of Organizational Support, Management Support, and Peer Support on Transfer of Training

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The intent of this study was to examine three specific work environment factors (organizational support, management support, and peer support) that affect transfer of training in a supervisory skills training program at one- month, six- month, and one-year points. The findings indicate a positive correlation between management support and transfer of knowledge and skills at the one-year time frame.

Keywords: Transfer of Training, Management Support, Organizational Support

HRD professionals continue to struggle with the reasons why a higher percentage of the skills and knowledge acquired during training programs do not transfer to the work environment and why transfer appears to diminish over time. Many organizations spend a significant amount of time and money on training. It was estimated that in 1998 the average United States employer spent well over 10% of payroll on education and training (Bassi & Ahlstrand, 2000). Yet, in one study, researchers found that HRD professionals believed that only 40% of the program content of a management development program was transferred to the work environment immediately after the program ended, about 25% was still being applied six months later, and a mere 15% was still being used at the end of one year (Newstrom, 1986). To a large extent, HRD practitioners have emphasized and developed sophisticated delivery devices at the expense of building the critical connection between the training site and the work environment (Brinkerhoff & Montesino, 1995).

A significant amount of research has been conducted to identify the effects of supervisory behavior on the level of productivity in an organization. After research identifies effective supervisory behaviors, training programs are designed and developed to teach supervisors and managers the skills and knowledge they need to know to increase employee productivity, job satisfaction, and organizational commitment. Many individual and organizational factors affect transfer of this training. Factors include individual motivation of trainees, training program design and delivery, organizational climate, and the person to whom the trainee reports.

There have been several efforts to expand the training perspective (Tannenbaum & Yukl, 1992). As early as 1980 (Wexley & Latham), "probability of transfer" was mentioned. Researchers (Baldwin & Magjuka, 1991; Hicks & Klimoski, 1987; Noe & Schmitt, 1986) have recognized the importance of several environmental characteristics and have examined variables outside the immediate training program that may be important to the success of the training effort. Broad and Newstrom (1992) identified barriers to transfer and discussed strategies to address these barriers. Factors affecting transfer include individual trainee characteristics, training program design and delivery, and work environment factors such as organizational support, trainee supervisor support, and peer support. Work environment factors influencing transfer of training are the focus of the study reported here.

Although there are several definitions of transfer climate, we draw on Broad and Newstrom (1992), Goldstein (1993), and Baldwin and Ford (1988) to define transfer climate as work environment factors perceived by trainees to encourage or discourage their use of knowledge, skills, and abilities learned in training on the job. Case studies reported by Broad (1997) indicate an increased emphasis by companies on building a climate that supports training transfer. Several researchers (Holton, Bates, Seyler, & Carvalho, 1997; Kozlowski & Salas, 1997; Rouiller & Goldstein, 1993) have examined specific aspects of transfer climate.

Baldwin and Magjuka (1991) examined the effects of three organizational "signals" on subsequent training outcomes. The pre-training signals examined were course information provided to trainees, accountability to the supervisor, and program status (mandatory or voluntary). Their study showed that when trainees received relevant information before the training program, recognized that they would be responsible for learning, and perceived the training to be mandatory, the trainees reported greater intentions to transfer the learning back to their jobs.

Another work environment factor that influences transfer is support of the trainee's supervisor (Broad, 1982; Huczynski & Lewis, 1980; Michalak, 1981; Nadler, 1971; Tannenbaum & Yukl, 1992; Zemke & Gunkler, 1985). Tangible and/or perceived support of the manager can be influenced before and after the training intervention.

Cohen (1990) found that employees were more motivated if their supervisors were supportive and if attendance is perceived to be voluntary rather than mandatory.

In today's team-centered work environment, co-worker support also might be important for transfer of training. Although considerable interest has been focused on supervisory support, less has centered on peer or co-worker support. Pea (1987) found that perceptions of support from both supervisors and co-workers contributed to transfer of training. Bates, Holton, Seyler, and Carvalho (2000) found that peer support was a significant predictor of learning transfer. Ford et al. (1992) found that work group support was relevant for affecting the opportunity to perform and a significant predictor in the performance of more complex and difficult tasks.

Understanding the variables that influence transfer of training can assist HRD professionals, managers, and organizations in selecting the appropriate techniques for facilitating the application of newly learned skills, knowledge and behaviors back on the job. The intent of the study reported here was to examine the work environment factors that affect transfer of training in a supervisory skills training program. If barriers to the transfer process are identified and supervisors are able to utilize and apply a higher percentage of knowledge and skills, then the potential exists for increased rate of return on the time and money invested in such training.

Research Questions

RQ1: What are the differences between each of the following work environment factors: organizational support, management support, informal peer support, and use of a formal peer support network, and perceived transfer of training?

RQ2: What are the differences between work environment factors and perceived transfer of training at the following points of time: one month, six months, and one year after completion of a supervisory skills training program?

RQ3: What similarities and differences exist in the perceptions of managers and trainees regarding organizational support, management support, and transfer of training?

Methodology

Sample

Seventy-five front-line supervisors from one unit of a large northeastern university participated in this study. This target group was selected because at the time of the study all front-line supervisors in this unit had completed a supervisory skills training program within the past year. The range of supervisory experience within this group ranged from less than one year (1.6%) to more than 20 years of experience (11.1%). Trainees were nominated either by their department head or through self-nomination and represented a cross section of colleges and administrative units throughout the university. In this unit, the trainees serve as peers to each other.

Procedures

Two questionnaires were used to examine the transfer of key skills emphasized in the supervisory training program and the perceived amount of management, peer, and organizational support given to the trainee regarding transferring skills into the work environment. Transfer behaviors were assessed using an instrument with a 6-point Likert-type scale ranging from a low of 0 (not at all) to a high of 5 (very frequently). The instrument was modified with permission from one developed by Rothwell (1996). Readers wanting a copy of the questionnaire should contact the first author.

Questionnaires were administered at meetings that were held at times convenient for trainees. Trainees were given the questionnaires and asked to return them to the researcher at the end of the meetings. A similar approach was used with each trainee's supervisor. The information gained was used to measure perceptual differences between the amounts of support received/given.

The data analysis for this study was done using quantitative statistical techniques. The statistical analysis was completed through applied statistics and SPSS. ANOVAs and correlations were conducted relevant to trainees' perceived use of the knowledge and skills learned during training, perceived level of support by peers, and managers, and perceived level of organizational support, and use of the peer support network to enhance the transfer process. All short answer responses were analyzed using open-coding techniques (Strauss & Corbin, 1990).

In addition, following the open-coding guidelines (Strauss & Corbin, 1990), clusters of items within the questionnaire were identified. The clusters identified were performance feedback, coaching, rewards and

recognition, and follow-up. Analysis of the clusters was accomplished using ANOVAs and correlations to determine the trainee's perceived level of support.

Limitations

This study was a study of perceptions. Perceptions of transfer of training may not equate to actual use of skills on the job. Second, data collected on a specific group of employees working in a union environment may have influenced the results of the study. Last, the design of the study called for the creation of sub-groups and clusters within categories, which reduced the n for several analyses.

Results and Findings

Research Question 1. What are the differences between each of the following work environment factors: organizational support, management support, informal peer support, and use of a formal peer support network and perceived transfer of training?

Transfer of training level for application of knowledge and skills was grouped as follows: Low (<40%); Moderate (≥ 41% to 80%), and High (>80%). The rating scale measuring application of skills ranged from 1 --not at all to 6--most of the time. Table 1 presents the mean, standard deviation and ANOVA results for work environment factors.

Table 1. *Means, Standard Deviations and ANOVA Results for Work Environment Factors by Perceived Transfer Level for Application of Knowledge and Skills*

Work Environment Factor by Level of Application	n	M	SD	F[a]	p
Organizational Support	46	2.674	.994	4.62	.015
Low	5	1.520	1.069		
Moderate	34	2.771	.883		
High	7	3.029	1.026		
Management Support	53	2.604	1.392	9.79	.000
Low	6	.694	.481		
Moderate	39	2.721	1.281		
High	8	3.465	1.126		
Peer Support	57	2.330	1.306	8.163	.001
Low	6	.650	.742		
Moderate	43	2.419	1.214		
High	8	3.113	1.113		
Peer Support Network	57	1.061	1.003	4.063	.023
Low	6	.167	.408		
Moderate	43	1.081	1.029		
High	8	1.625	.720		

Note. Low(<40%), moderate(41- 80%), and high (>80%) groupings of perceived application of knowledge and skills [a] Sheffe post hoc analysis revealed significant differences exist within organizational support, management support, and peer support between the low and moderate application groups and between the low and high application groups for all four factors. No significant differences exist between the moderate and high application groups for the four work environment factors.

Significant differences were found in transfer of training between groups in organizational support, management support, peer support, and in peer support network. The Scheffe post hoc test was used to identify areas of specific differences. For the four work environment factors, the high level of application group had significantly higher means than did the low application group. Trainees who reported receiving higher levels of organizational, management, and peer support also reported applying, to a higher extent, the knowledge and skills learned in the supervisory training program.

The organizational support and management support factors were examined by clusters. The three clusters examined for organizational support were performance feedback, coaching, and rewards. The four clusters examined for management support were performance feedback, coaching, rewards, and follow-up. The Scheffe post hoc analysis revealed significance difference in the organizational support cluster of coaching between the low and high application groups and in the organizational cluster of rewards between the low and moderate application groups. The Scheffe post hoc analysis revealed significance difference in the management support clusters of performance feedback, coaching, rewards and follow-up between the low and moderate application groups and the low and high application groups.

Specifically, trainees who reported receiving a higher level of support (performance feedback, coaching, and rewards) from the organization and a higher level of support (performance feedback, coaching, rewards, and follow-up) from their supervisors also reported a higher level of transfer of training.

Research Question 2. What are the differences between work environment factors and perceived transfer of training at the following points of time: one month, six months, and one year after completion of a supervisory skills training program?

Significant differences were found between application groups in organizational support, management support, and peer support only at the one-year time interval. The Scheffe post hoc test was used to identify specific areas of difference. For each of the work environment factors (organizational support, management support and peer support) the high level of application group had significantly higher means than did the low application group. No significant differences were found between groups in the peer support network.

For organizational support, the high application group reported an overall mean of 2.60 (SD = .608) as compared to the mean of .93 (SD = .862) for the low application group. For management support, the high application group reported an overall mean of 2.99 (SD = 1.18) as compared to the mean of .44 (SD = .509) for the low application group. For peer support, the high application group reported an overall mean of 2.90 (SD = 1.30) as compared to the mean of .007 (SD =.116) for the low application group.

The investigators examined specific clusters relative to time--one month, six months and one year-by perceived transfer of training. Again, only at the one-year time frame was the relationship significant between trainees reporting receiving higher levels of support and trainees reporting higher transfer of training.

Research Question 3. What Similarities and Differences Exist in the Perceptions of Managers and Trainees regarding Organizational Support, Management Support, and Transfer of Training?

The summary index for the three variables reflects the combined perception of application of skills (17 statements from survey), management support (18 statements from survey) and organizational support (10 statements from survey). No significant differences were found between the perceptions of managers and trainees regarding organizational support, management support, and transfer of training (See Table 2).

Management support was the only variable that approached statistical significance (p = .072). In the management support clusters, no significant differences were found between the perceptions of managers and trainees regarding the performance feedback, rewards, and follow-up clusters. The management support coaching cluster was the only variable that was statistically significant (p = .001). For the management support coaching cluster trainees reported an overall mean of 2.88 (SD = 1.43) as compared to the mean of 3.78 (SD = .732) for the managers.

Analysis of the data revealed no significant differences between the perceptions of managers and trainees regarding transfer of training and two of the work environment factors: organizational support and management support. No significant differences were found between the perceptions of managers and trainees regarding organizational support clusters and transfer of training. In the management support clusters, no significant differences were found between the perceptions of managers and trainees regarding the performance feedback, rewards, and follow-up clusters. The management support coaching cluster was the only variable that was statistically significant (p = .001). For the management support coaching cluster, trainees reported an overall mean of 2.88 (SD = 1.43) as compared to the mean of 3.78 (SD = .732) for the managers.

Table 2. T Test Results Comparing the Perceptions of Managers and Trainees Regarding Organizational Support, Management Support, and Transfer of Training by Cluster

Cluster	n	M	SD	F	Sig (2-tailed)
Organizational Support					
Performance Management Cluster					
Trainees	62	3.21	1.18	.070	.698
Managers	18	3.33	1.20		
Coaching Cluster					
Trainees	48	2.52	1.17	.354	.900
Managers	16	2.56	1.09		
Rewards Cluster					
Trainees	60	2.25	1.08	.569	.960
Managers	18	2.24	.82		
Management Support					
Performance Feedback Cluster					
Trainees	58	2.58	1.45	4.051	.126
Managers	17	3.08	1.05		
Coaching Cluster					
Trainees	59	2.88	1.43	12.21	.001
Managers	18	3.78	.732		
Rewards Cluster					
Trainees	59	2.68	1.45	.976	.104
Managers	18	3.31	1.31		
Follow-up Cluster					
Trainees	61	1.79	1.46	2.801	.206
Managers	18	2.28	1.24		

The examination of clusters relative to similarities and differences in the perceptions of managers and trainees regarding the two work environment factors revealed no significant differences in the organizational support clusters. In the management support cluster, coaching was the only variable that was significant. In the coaching cluster, managers perceived that the level of coaching given was significantly higher than that perceived by trainees.

Conclusions and Recommendations

Trainees who reported receiving higher levels of support in the work environment indicated they were applying, to a higher extent, the knowledge and skills they learned in the supervisory training program. In addition, certain support actions by the organization and management appear to provide a higher level of application, knowledge, and skills than others. More specifically, the results suggest that particular actions such as coaching may play a significant role in the transfer of training.

Empirical research has been limited regarding the effect of peer support and transfer of training. The results of this study indicate that peer support does influence transfer of training. Trainees who perceived higher levels of peer support throughout the training program indicated they were applying, to a higher extent, the newly learned knowledge and skills. Peers in the organization under study completed the supervisory training program in a short time frame (one year), so trainees were able to share and apply the information learned more readily. In addition, supervisors who attended the program may have served as supervisors to others who attended and thus, were able to provided support both as a peer to others and as a manager. However, results suggest that the utilization of the peer support network did not affect transfer of training.

The results also reveal that the time element is an important factor to consider when measuring a trainee's application of knowledge and skills and perceived support. No difference occurred during the one-month and six-month periods. Limited research has been done examining the effects of work environment factors on the transfer process over longer periods. Several possibilities exist as to why differences were revealed only at the one-year time frame. If trainees did not have opportunities to utilize the knowledge and skills when they first completed the training program, then trainees might perceive they were not supported by the organization, their supervisor, or their peers due to the fact that other priorities may have infringed on the opportunity to use the skills. In addition,

organizational incentives, such as promotional opportunities or salary incentives may have more impact at the one-year time frame than at the one-month time period.

The results of this study reveal that no significant differences exist between trainees and managers regarding two of the work environment factors: organization support and management support. It was interesting to find that when clusters were examined relative to similarities and differences, differences did exist in the management support coaching cluster. Managers perceived that the level of coaching given was significantly higher than what was perceived by the trainees. One possible explanation for the fact that no differences were found in the organizational support clusters and management support clusters of performance feedback, reward, and follow-up is due to the small sample size and the fact that 70% the managers who responded to the survey had also participated in the supervisory training program.

Implications for HRD

Evidence exists that work environment factors support transfer of training. It is recommended that HRD professionals focus not only on the individual trainee and training program content, but also on organizational support factors that influence transfer. Organizations should take steps to assure that full support is given to professional development efforts. In order to identify whether or not an organization is supportive of professional development efforts, HRD professionals first may need to assess the transfer climate.

The significance of management support and its effect on transfer provides strong support for implementation of processes that will assist managers in collaborating with trainees as they participate in training programs. In the study, the imp ortance of coaching by the manager enhanced the application of knowledge and skills. A technique that could be utilized includes requiring trainees to meet regularly with their managers to discuss action plans and on-the-job application of skills. Another technique that could be used involves structuring pre-training course sessions for managers, where managers could learn about the content of training courses being provided for their direct reports and actions managers might take to support trainees throughout the training program.

The finding that peer support affects transfer of training has implications for HRD professionals. While further research is needed in this area, support mechanisms can be developed to enhance peer support. In this study, the use of a peer support network did not prove to be significant; however, the concept of providing such a mechanism for peers to interact, share ideas and information may be useful it the network were structured differently. One idea is to establish peer group meetings after the training is over. This would provide peers the opportunity to share additional information and/or address lingering questions.

Recommendations for Future Research

With the amount of funds allocated toward training in organizations today, a careful examination of how to gain a better return on investment in training is important. This study can help organizations assess their work environment and design interventions that will better utilize the training dollars spent.

The focus of this study was to examine the effect of work environment factors (organizational support, management support, peer support, and the use of a peer support network) on transfer of training. The design allowed for examination of those factors over three periods: one month, six months, and one year. Ns were quite low; however, for some clusters. Examination of a larger group size would benefit future studies. Given the findings of this study and the extant literature on transfer of training, continued research is needed to examine the role of the work environment on the transfer of training. Since the findings indicate that work environment factors do influence the application of knowledge and skills, future research should examine more specifically the types of actions that bring about the highest impact for the trainees.

Research on the question related to timing of support actions would provide useful information. Specifically, does the timing (before, during, and post) of such support actions hinder or help the transfer process? If certain support actions are timely, and recognized by both the manager and trainee as significant to the trainee's participation in the training program, then would that hinder or help the transfer process? There appears to be a need to measure transfer over longer periods. Measuring transfer over a one- or two-year period would provide trainees a greater opportunity to apply the knowledge and skills they learned during training and would provide opportunities for organizations to plan for supportive actions to enhance transfer.

Another area for future research involves the ability of trainees to distinguish between the many types of support actions provided to them in the work environment. Do trainees distinguish between the support actions as an organizational action, management action, and peer action, or do they view all support actions as one entity?

Clarifying how trainees view work environment factors would be beneficial to help to define the impact of specific factors and transfer of training.

Future research with a larger size group to determine the impact of peers would be beneficial. More specifically, what are the specific actions peers take that affect transfer over longer time periods? Do peers recognize the informal conversations they have regarding the training as supportive actions or do they only recognizing specific supportive actions such as assisting with work responsibilities while the trainee attends the training program?

Examining the potential to utilize a formal peer support network and assess the utility of this device would be beneficial to organizations. Are there different types of networks or mediums that can be utilized to provide peers the support they need before, during, and after training to enhance the transfer process? Does the use of technology, the Internet and e-learning change the types of peer support needed?

Future research would also be valuable in examining the impact of organizational barriers and constraints facing organizations today and in assessing the total impact of these barriers (time constraints, union contracts, lack of funds, and resources) on the transfer process. This study was conducted in a non-profit organization with limited resources for rewards and recognition. Does this limitation prohibit an organization from truly enhancing the transfer process, despite the attempt to provide organizational, management, and peer support? Finally, can the day-to-day barriers and constraints reported by trainees be controlled by the organization to ensure adequate transfer of training?

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The Impact of Workplace Design on Training Transfer

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The present study investigates the impact of workplace design on training transfer and where the physical environment fits in with other organizational factors impacting transfer. Tentative findings indicate that trainees perceive workplace design to be an important organizational factor impacting transfer. Utilizing an ethnographic approach, cumulative frequencies for elicited responses about organizational factors were highest for workplace design perceived to impede transfer and second highest for workplace design perceived to facilitate transfer.

Keywords: Workplace Design, Training Transfer, Organizational Factors

This study examines workplace design as an organizational factor impacting training transfer. While HRD research recognizes the importance of organizational context in influencing worker ability and opportunity to transfer (Roullier & Goldstein, 1993; Tracey, Tannenbaum, & Kavanaugh, 1995), the physical environment has been overlooked as a potential contributor. None of the fifty-eight studies included in the most comprehensive reviews of the transfer literature (Baldwin & Ford, 1988; Ford & Weissbein, 1997) examines workplace design, yet the physical environment is an integral part of organizational context (Sundstrom & Altman, 1989; Sundstrom, De Meuse, & Futrell, 1990).

HRD initiatives that take workplace design into account support HRD's mission to provide the best opportunity to perform efficiently on the job. A 30-year established body of Environment and Behavior (EB) knowledge documents workplace design as an integral part of organizational context that can enhance or inhibit individual, group and organizational performance (Becker & Steele, 1995; Brager, Bauman, Heerwagen, & Ruland, 2000; Brill, Keable, & Fabiniak, 1999; Brill, Margulis, Konar, & BOSTI, 1984,1985; Brill, Weidemann, & the BOSTI Associates, 2001; Brookes & Kaplan, 1972; Crouch & Nimran, 1989; DeMarco & Lister, 1985; Ellis & Duffy, 1980; Hedge, 1982; Kupritz, 1998; Marans & Spreckelmeyer, 1982; Springer, 1982; Vischer, 1996). EB studies, however, have not approached work performance from a training and development perspective. The present study draws from this EB knowledge in its examination of the impact of workplace design on training transfer. The application of EB theory to human resource development needs allows the disciplines to examine workplace design from a multi-disciplinary perspective. The objectives of the present study were to identify design features that facilitate and impede training transfer and to determine where workplace design fits in with other organizational factors impacting transfer.

Why HRD Professionals and Organizations Need to Pay Attention to Workplace Design Issues

Even though HRD professionals do not have control over the physical environment, they need to understand the vital role that workplace design plays as an organizational factor in training and development. Conversations with M. Lawer (personal communication, September 30, 1998), a training specialist at a major university, point to performance difficulties attributable to workplace design:

Quite frequently, in at least half of the [training and development] workshops I present, the discussion turns to difficulties attributable to workplace design. For instance, in a recent workshop on delegation skills, a supervisor cited her office's physical layout as an obstacle; in her opinion, the extremely open nature of the office makes it difficult to give effective feedback to employees, as other employees as well as students can hear all that is said. Similar stories, detailing the effects of physical design on routine work activities, are recounted weekly.

Kupritz (2000b) highlights important reasons why HRD professionals should pay attention to design features impacting privacy in training and development whose reasons are just as valid for workplace design features at large. First, understanding the ramifications of the physical environment is crucial for helping trainees develop personal action plans that include potential physical obstacles and opportunities and helps trainees systematically

think through which aspects of the training realistically can be used within these physical constraints. Action planning identifies organizational constraints (such as design limitations) and opportunities to perform learned behavior on the job that allow trainees to return to work with a realistic and workable action plan. This activity helps workers maximize their opportunities to perform efficiently on the job and starts the important process of training transfer (Cheek & Campbell, 1994). From the larger organizational perspective, action planning empowers individuals and groups by giving people some control over decisions affecting their work. Research has demonstrated that worker control over their work environments—both actual and perceived—can enhance physical health and offset the stressing effects of heavy workloads and a fast work pace (O'Neill & Evans, 2000). O'Neill and Evans determined that training workers on how to use their adjustable workstation designs reduced stress and enhanced motivational performance. The adverse effects of job-related stress are well-documented (Kahn & Byosiere, 1992; Karasek & Theorell, 1990).

Secondly, understanding the ramifications of the physical environment is crucial for designing a training environment psychologically and physically that simulates workplace design conditions in the application environment. Instructional design models stress that transfer is more likely to occur when learning conditions approximate the application environment (Clark & Voogel, 1985; Laker, 1990). The need for trainers to approximate the actual conditions created by design limitations and design opportunities holds true for all training experiences, be it a noisy office environment to an extreme environment such as a military maneuver in desert-like conditions. For example, O'Neill and Evans (2000) staged interruptions during training as trainees practiced certain tasks to approximate office conditions these learners encounter on the job. Simply put, sound training may not occur in a quiet atmosphere if in fact the actual workplace is noisy, filled with distractions and interruptions any more than military training would occur in jungle-like terrain for desert warfare (see the National Simulation Center for live, virtual and constructive training, 1999).

The physical environment is not under the control of the trainer, but the conditions under which the training experience occurs are. To this end, Kupritz (2000b) suggests that trainers can simulate uncrowded or crowded conditions that approximate the density of the trainees' actual work environment. Mock set-ups of workspaces that facilitate or hinder work processes can also be incorporated into the training experience. Further, trainers can simulate visual and acoustical distractions and interruptions by introducing pedestrian traffic, incorporating background noises (e.g., office equipment) and conversations, and staging interruptions. Kupritz concludes that trainees are better prepared to cope with the physical environment through training that approximates the physical conditions and action planning that helps trainees identify physical constraints and opportunities to support learned behavior on the job.

Thirdly, understanding the ramifications of the physical environment addresses another dimension of organizational context that may improve transfer. The multi-dimensional nature of training transfer presents a formidable challenge to organizations. Corporate America continues to spend billions of dollars annually on training, much of which has either failed to transfer or has been extinguished over time (Broad & Newstrom, 1992; Foxon, 1993; Georges, 1988; Grabowski, 1983; Kelly, 1982). This failure to transfer has particularly happened with training in problem solving, management development and interpersonal skills (Foxon, 1993). Holton and Baldwin (2000) cite a common estimate that only 10 percent of training actually transfers to job performance, but caution that this has not been empirically documented. Enough empirical evidence exists to document that transfer is extremely low even though the precise figure may not be known. While HRD research continues to seek solutions that improve transfer, much of the transfer research has focused on factors within the formal training context (Holton & Baldwin, 2000). A stream of research, however, has evolved that examines the importance of organizational factors in the work environment to support learned behavior on the job (Rouillier & Goldstein, 1993; Tracey, Tannenbaum, & Kavanaugh, 1995). This stream of research targets organizational factors such as level of management and collegial support, availability of resources and technology to support transfer, timeliness of training to try out new learning, training relevance, potential application of training on the job, and transfer climate (see the review by Ford & Weissbein, 1997; also Foxon, 1993).

Although progress has been made in understanding organizational factors impacting transfer, Kupritz (1999, 2000a) proposes that workplace design has been neglected as another organizational factor that can enhance or inhibit the ultimate success of a training intervention. Kupritz synthesized EB theory for workforce training and development to examine workplace design that impacted older and younger worker performance. The Kupritz studies, however, did not measure the impact of training-specific situational factors on newly acquired skills. To this end, the present study measures trainee perceptions about the impact of organizational factors on newly acquired supervisory skills. This type of approach supports Tracey, Tannenbaum and Kavanaugh's (1995) contention that measuring situational factors that are training-specific can help move beyond the question of whether training works to why training works.

Research Methodology

The study participants (sample) consisted of 24 office workers who are actively involved in supervisory duties within the same major university. The office workers participated in a training workshop for supervisory skills within a four-month period and were now on the job. These employees attended one of three supervisory training programs with similar training skills taught by the same trainer at the university. The training skills included encouraging upward communication, disseminating information effectively, delivering unpopular messages, effective feedback strategies, mastering listening skills, identifying basic requirements for performance and evaluation, maintaining high morale, and understanding team influences.

The study utilized the first phase of the Heuristic Elicitation Methodology (HEM) to interview the 24 office workers. The first phase of the HEM is qualitative and is designed to exhaust the range of respondent perceptions concerning the variables being examined. As a cognitive ethnographic method, the basic assumption of the HEM is that it is possible to match particular items and attributes with particular cultural values (Harding & Livesay, 1984). Ethnographic procedures such as the HEM help to establish authenticity through the nature and format of the questions asked, followed by content analysis techniques (see Denzin, 1978; Denzin & Lincoln, 1994; LeCompte & Schensul, 1999). The ability to establish validity, especially internal validity, has been regarded for some time as a major strength of ethnographic procedures (Goetz & LeCompte, 1984; LeCompte & Schensul, 1999). HEM stimulus materials are respondent-generated rather than investigator-generated. Similarly, data is respondent-categorized rather than investigator-categorized. This procedure preserves the language and conceptualizations of respondents and decreases the likelihood of overlooking significant attributes of a domain being examined (LeCompte & Schensul, 1999; Spradley, 1979; 1980).

Structured interviews were conducted with each office worker over a 30-60 minute period. The structured interview is the first phase of the HEM, called the Domain Definition. The Domain Definition is an open-ended interview in which the language of the respondent is used in a series of interlinked questions, with answers recorded verbatim. Using the respondent's own language in the questions helps to establish a shared meaning of language. The interviews reveal the range of items and attributes of a well-defined domain relatively quickly (Harding, 1974; Harding & Livesay, 1984; Kupritz, 1998). The HEM consists of several elicitation phases, however, any elicitation phase can be used individually and stand alone as a separate investigation (Harding, 1974). The methodology is predicated upon the idea that "language provides a powerful entry to cultural meaning structures" (Harding & Livesay, 1984, p. 75).

The Domain Definition identifies domains through semantic relationships in terms of behavior, artifacts and knowledge that people have learned or created. A "domain" is a set of categories organized on the basis of a single semantic relationship (e.g., "X" is a kind of "Y"; "X" is a way to do "Y"). The research instrument for this study was designed to elicit information primarily about organizational factors perceived as facilitating and impeding training transfer. The 10 questions asked avoided "referential meaning" by asking for "use" through contrast, similarity, uniqueness and the ideal in an effort to exhaust a domain (LeCompte & Schensul, 1999; Spradley, 1979; 1980). Three of the 10 questions are presented below, illustrating the nature and format of the questions used in this study:

Q. What skills learned in this workshop are you now using on the job? [Answers = "X"]

Q. When "X", what conditions, or office features, or situations make it easier to "X"?

[Answers = "Y"] PROBE: What else might make it easier to conduct "X" other than "Y"?

Q. When "X", what conditions, or office features, or situations make it harder to "X"? [Answers= "Y"] PROBE: What else might make it harder to conduct "X" other than "Y"?

The investigators conducted domain and taxonomic analyses utilizing content analysis procedures (see Spradley, 1979). These analyses involve sorting through interview responses and identifying patterns, categories, or themes. A tabular worksheet was developed that displayed semantic relationships. Possible cover terms and included terms (i.e., items and attributes) that appropriately fit the semantic relationships were searched for in the data. Making systematic use of this kind of worksheet helps to uncover domains embedded in the interview responses (Spradley, 1979). For example, included terms dealing with effective interpersonal communication were grouped as items and attributes under the same cover term, positive management support. Each item and attribute included under this cover term fit the semantic relationship, "X" (e.g., listen more collectively) is a kind of positive management support.

Items and attributes were respondent-generated and respondent-categorized to preserve the language and conceptualizations of respondents. Each item and attribute was represented in some domain category. Key participants reviewed the domain categories for accuracy and gave positive feedback (see Creswell, 1994; Merriam,

1988). Following the content analyses, cumulative frequencies for similar types of items and attributes were calculated to determine how often similar types were elicited. Quantifying included terms in domain categories allowed the investigators to determine included terms elicited most frequently and to gain a beginning understanding about the distribution of beliefs across domain categories. A system of cultural meanings was uncovered that these office workers use to denote and connote organizational factors impacting transfer.

Findings

Elicited responses by the office workers revealed four main organizational factors as facilitating transfer: positive management support; supportive workplace design; availability of technology and equipment; and positive coworker support. Elicited responses also revealed four main organizational factors as impeding transfer: unsupportive workplace design; lack of management support; lack of coworker support; and lack of time in general (but not perceived as caused by management). Table 1 reports cumulative frequencies computed for each of the main organizational factors.[2] Cumulative frequencies for elicited responses were highest for positive management support perceived to facilitate transfer, followed by workplace design.

Table 1. *Cumulative frequencies for the main organizational factors perceived to impact transfer*

Organizational Factors Facilitating Transfer	*f*
Positive management support	71
Supportive workplace design	53
Availability of technology and equipment	19
Positive coworker support	9

Organizational Factors Impeding Transfer	*f*
Unsupportive workplace design	43
Lack of management support	30
Lack of coworker support	29
Lack of time in general (not elicited as caused by management)	14

Elicited responses for positive management support perceived to facilitate transfer included:
Listen more collectively; open environment, personnel would be welcome to make comments; try to be available; make sure they [employees] are appreciated; try to recognize when people express interest; not want to openly chastise them in front of their peers; [manager] leads and takes the lead; should always be an open door to express concerns, whether negative or positive; encourage diversity [in opinions]; being allowed a flexible schedule; [providing] regular staff meetings; have staff meetings on a regular basis, if there is a problem you can talk about it right away; management not restricted by deadline; fully staffed; if we can hire somebody at rush [time] in the middle of the year; not to have so many [hierarchical] layers; opportunity for cross-training; a pay raise; [employees] need to have a purpose and a goal.
[verbatim responses by office workers]

Elicited responses for supportive workplace design perceived to facilitate transfer included:
An office with less people; if we had less other offices in this unit, it would create unity; if it [workspace] is quiet; if you were set up in cubicles with the door closed, then it is private; should be offered some sort of withdrawal if you are dealing with sensitive matters; walls to go to the ceiling; I wish I had an office with a door, you need to talk privately; having my own office would be ideal so you can concentrate on that thing at one time; go to a place where you are uninterrupted, need to be away from the environment, the everyday environment; if there are no interruptions; close proximity; being close together; good working space to get things done; office environment plays a role, [it] puts the team in a better frame of mind; an office with adequate workspace and facilities; environmental things add or take away from one's motivation; communal area for team meetings [is needed]; as far as efficiency and morale, a nicer environment; have to be comfortable--a desk, chair and climate [like we had] in the old building; an office with windows to see outside.
[verbatim responses by office workers]

Cumulative frequencies for elicited responses were highest for workplace design perceived to impede transfer, followed by lack of management support. Elicited responses for unsupportive workplace design perceived to impede transfer included:

Too crowded up here; overcrowding; don't have my own office, keeps me distracted; I am sitting there with no privacy-often times I can hear the other person on the phone; don't have room for cubicles physically, find yourself listening to others' conversations and it breaks your concentration; the break room is right there, the room is very disruptive, you don't feel free to talk; sometimes people congregate around the phone, makes it hard to hear on the phone; the nature of the business by virtue of the physical structure where my office [is] and there is a physical line to allow the employees to stop by; constant interruptions; too spread apart; a lot of skills I cannot use because I am so far moved; if my office were closer, the physical part; the environment does not set up for impromptu; harder down here because of the layout of the facility; cubicles, the problem is you have to physically get up [to] ask them [employees].

[verbatim responses by office workers]

Elicited responses for lack of management support perceived to impede transfer included:

Other priorities, don't have one-on-one interaction; some of our supervisors get stuck in the old way of thought; difficulty communicating upward; overbearing supervisor; a supervisor who interrupts all the time; time management, it is hard to service three locations; office schedules are different; time sometimes, things go unattended; being short-handed does something to morale; to go through so many [hierarchical] layers to get things approved; no training; an employee who has no skills, you need to have opportunities; highly specialized activities, very compartmentalized; when you are bombarded with three or more people busy telling me things to do, they all want an answer right away; lack of priorities; don't show that much recognition when someone does something good; recognition needs to come higher; no management support for team.

[verbatim responses by office workers]

Cumulative response frequencies were then broken down to examine the distribution of beliefs across similar types of items and attributes for each organizational factor. Table 2 reports response frequencies computed across items and attributes for the top four organizational factors elicited as impacting transfer. Items and attributes dealing with effective interpersonal communication were elicited most often as facilitating transfer among all organizational factors. Items and attributes dealing with workplace design features that did not support privacy needs were elicited most often as impeding transfer among all organizational factors.[3] As stated earlier, no inferences can be made at this time about the strength of association or the relative weighting of importance for these elicited items and attributes and their domain categories.

Table 2. *Response frequencies computed across item and attribute groupings for the top four organizational factors*

Organizational factors	Item and attribute groupings	*f*
Positive management support facilitating transfer	• Effective interpersonal communication	42
	• Efficient management of logistic resources	13
	• Efficient management of human resources	16
Supportive workplace design facilitating transfer	• Workplace design features supporting privacy needs	26
	• Efficient and flexible workspace	13
	• Close proximity to workers	4
	• Sharing of workspace to increase communication	4
	• Aesthetically pleasing, adequate comfort level, corporate image reflected in workspace	5
	• Workspace with windows	1
Unsupportive workplace design impeding transfer	• Workplace design features not supporting privacy needs	26
	• Inefficient and inflexible workspace	6
	• Proximity too far away from coworkers	7
	• Space not shared, creating communication barriers	4
Lack of management support	• Ineffective interpersonal communication	10

impeding transfer	• Inefficient management of logistic resources	9
	• Inefficient management of human resources	11

Implications

The theoretical considerations presented in this study, though still in their formative stage, provide a beginning knowledge base about the impact of workplace design on training transfer. The study indicates that trainees perceive workplace design to be an important organizational factor in facilitating and impeding transfer for supervisory work practices. The findings reveal that unsupportive workplace design is foremost in the minds of trainees when discussing organizational factors impeding transfer for supervisory skills and, pending further research, may contribute to the 10 percent low transfer record commonly cited for work practices at large. HRD professionals, therefore, cannot afford to ignore the vital role that workplace design may play in transfer, especially considering ASTD's 2001 report that corporate expenditures for managerial and supervisory training are at "fairly high levels" worldwide (Marquardt, King, & Koon, 2001, p. 10). For example, Canada and Australia/New Zealand in 1999 spent 22 and 21 percent of their training budgets, respectively, on managerial and supervisory training.

The findings also reveal that supportive workplace design may improve transfer. Unfortunately, the reality is that most people work in distraction-porous workspaces--filled with interruptions, acoustical and visual distractions, etc.--all of which contribute to unsupportive workplace design (Brill et al., 1999). This means that HRD professionals need to acknowledge the pervasive mismatch that exists between the quiet, structured classroom-type training environment and the noisy, interruption-filled "real world" work environment. Brill et al. (2001) describe this work reality, based upon an extensive study of some 13,000 American office workers:

Of all their time, people in all job types spend by far the most doing quiet work. Supporting quiet work is one of the two top productivity enhancers and job satisfiers. However, two-thirds of those in open offices (the most prevalent workspace type) are "often distracted by others' conversations" and can't do undistracted work. (p. 32)

Instructor-led classroom training continues to predominate training delivery globally, ranging from 56.2 % to 84.5% with the United States at 79.9 % (Marquardt, King, & Koon, 2001). This high percentage emphasizes the need for training to approximate physical conditions of the work environment more closely during the classroom experience, and to incorporate potential design obstacles and design opportunities into action planning so that trainees can return to work with a realistic and workable action plan.

The detail gained from this initial study warrants further studies that examine the impact of workplace design on other types of training skills and where workplace design fits in with other organizational factors for these training skills. It may be that workplace design is an important organizational factor impacting transfer for some work practices but not for others. Workplace design, on the other hand, may be important for transfer across the board. The ethnographic nature of the present study did not allow the investigator to prioritize the relative importance of workplace design compared to other organizational factors. Future studies can measure the relative weighting of importance given to organizational factors by respondents and the strength of relationships between organizational factors and acquired training skills.

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Transfer Of Learning: How Managers Develop Proficiency

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The purpose of this study was to expand the theoretical framework for understanding the transfer of learning by investigating the relationship between transfer of learning, proficiency, work environment variables, and informal learning; and to contribute to the existing theory of informal learning by investigating the role that informal learning plays in the development of managerial skills.

Keywords: Informal Learning, Transfer of Learning, Metacognition

Corporate managers require complex cognitive skills in order to work effectively with highly technical systems; interpersonal skills to be able to work competently in work teams; and leadership skills to effectively manage. A few decades ago, the solution to manager proficiency problems was to send people to formal classroom training (Wexley & Latham, 1981). Now, formal training programs are being criticized because they do not prepare employees to keep pace with the constant change that occurs in today's workplace, do not provide employees with sufficient "real world" experience to develop proficiency (Sheckley & Keeton, 1999), and are not adaptive and meaningful to employees (Poell, Van Der Krogt, Wamerdam, 1998). This study investigated the relationships between managerial proficiency, transfer of learning, the means by which managers develop proficiency, and the transfer climate in the work environment. Understanding these complex relationships is valuable because it will help organizations to capitalize on their learning programs, reduce costs, ensure a more productive workforce and, ultimately, enhance their competitive advantage.

Problem statement

In 1998, an estimated 5.3 million managers were sent to formal training, resulting in 166.2 millions hours of managerial training (Bassi & Van Buren, 1999). While formal classroom training is one way for managers in organizations to learn, it may not be the most effective or most widely used learning method. According to Day (1998), 70% of learning in companies occurs informally from activities that take place outside of the classroom setting. Despite the prevalence of informal learning in the workplace, research has focused primarily on the transfer of skills learned during formal training (Rouiller & Goldstein, 1993). Due to the lack of research on what facilitates the application of skills learned informally, human resources practitioners are left with unanswered questions about ways to ensure that employees apply what they learn informally.

Theoretical Framework

Proposition 1: A Manager's Level Of Proficiency is Positively Related to the Transfer Of Learning. Sheckley and Keeton (1999) defined proficiency as the ability to skillfully apply knowledge within a particular domain. Research suggests that individuals who are proficient within a particular skill domain have an extensive and well-organized knowledge base that is built from experience (Chi, Feltovich, & Glaser, 1981; Kraiger, Ford, & Salas, 1993). When a knowledge structure is robust, strong links between problem types and specific solutions exist, thus enabling transfer of learning. For example, Gick and Holyoak (1983) found that 58% of individuals with better quality schemas (an indicator of a well-organized knowledge base) were able to solve a target problem compared to 29% of subjects who had poor schemas .The association between managerial proficiency and the transfer of learning has not been investigated in past studies. Based on the research addressed above, it was expected that managerial proficiency would relate positively with the transfer of learning.

Proposition 2: Managers Learn Mostly Through Informal Learning In The Workplace. Although formal classroom training is the most widely used mode of instruction to develop managers in today's corporations (Bassi & Van Buren, 1999), research suggests that most managerial learning takes place informally (Lowy, Kelleher, & Finestone, 1986; McCall, Lombardo, & Morrison, 1988). Informal learning strategies include job experience

(Davies & Easterby-Smith, 1984; McCall, et al., 1988), networking (Watkins & Marsick, 1992), solving genuine work problems (Sheckley & Keeton, 1997), and coaching (Watkins & Marsick, 1992) as well as supervision, mentoring, meetings, customer interaction, goal-directed peer-to-peer communication, internal customer interaction, observing peers and supervisors, socializing, and exploration (Day, 1998). Although past informal learning research has demonstrated support for managers learning mostly from informal learning, gaps remain in the literature concerning the degree to which learning takes place informally and the specific types of learning activities that managers engage in to learn informally. This study was conducted with the intention of filling these gaps in the literature.

Proposition 3: Skills Learned Through Informal Learning Will Be Transferred More Readily Than Skills Learned During Formal Training. Proposition 3 is underpinned by common elements theory which holds that when individuals are able to make connections between past experiences and current problems, transfer of learning is likely to occur (Butterfield & Nelson, 1995). A premise of this study was that skills learned informally are more likely to share similar features with transfer tasks in terms of context and content. Therefore, skills learned informally are more readily applied than skills learned formally. Yorks, et al.(1998) found that 80% of employees who interacted with the managers who attended an action learning reflection program that required managers to work on real-time problems as a learning mechanism reported that they saw noticeable differences in the managers' behaviors after training. Further, Stolovitch and Yapi (1997) found large effect size differences in transfer between subjects who participated in a case study method of training and a control group who did not participate in case method training (d = 2.4). Past research on how the similarities between learning situations and transfer tasks increases the likelihood of transfer of learning formed the basis of this study.

Proposition 4: A Supportive Work Environment Facilitates the Transfer Of Learning Over the past decade, a number of studies were conducted that investigated the relationship between work environment factors and the transfer of training. Rouiller and Goldstein (1993) conducted the study that provided the best support that work environment factors relate to the transfer of training. In their study, the researchers found that transfer climate (an aggregate measure of work environment factors) explained 36% of the transfer of training variance. Several studies (e.g., Brinkerhoff & Montesino, 1995; Facteau, Dobbins, Russell, & Kudisch, 1995; Foxon, 1997, Tracey, et al., 1995; Xiao, 1996) have measured the relationship of specific work environment variables (e.g., coworker support, supervisor support, organizational support) with the transfer of training. The studies that have been conducted to date have examined the relationship between work environment variables and the transfer of learning from formal training programs. A gap in the literature remains concerning the role that work environment factors play in the transfer process when skills are learned informally. The results of this study were expected to show a positive relationship between work environment variables and the transfer of learning.

Methodology

Setting. This study was conducted in 1997 with managers who worked at a large subsidiary of a 100 year old Fortune 100 company located in New England. The company, a leading provider of insurance products that employed approximately 20,000 employees, was experiencing rapid growth, deep change, and extensive mergers. The sponsoring company valued effective management education and provided a wide variety of formal training programs for managers centered on developing proficiency around several core leadership behaviors. Further, informal learning was recognized by senior leaders, and the organization at large, as a purposeful activity. The extent and frequency of informal learning in the organization cannot be stated with any degree of certainty since the company did not have any formal metrics in place that measured informal learning.

Participants. A sample of 188 managers was identified by the company's HR department from a larger population of managers as potential participants for the study. Of the 188 managers who were invited to participate in the study, 45% (84) took part by completing a questionnaire. All participants were notified through informed consent that their participation or non-participation would not affect their status as an employee of their company, and were ensured of confidentiality. The respondents included 60 (71%) women and 24 (29%) men. Respondents were on average 42 years old, ranging from 25 to 61 years, with an average of 10 years of managerial experience. Thirty percent of the managers had 1-5 years of managerial experience, 38% had 6-10 years, 16% had 11-15 years, and 16% had more than 16 years of managerial experience. Most participants (43%) had earned a Bachelor's degree while 17% held a Master's degree, 14% an Associates degree, 13% a High School diploma, 6% a Ph.D. or M.D.

Instrumentation. The questionnaire developed for the study consisted of three sections. Section I of the questionnaire consisted of 20 items that pertained to core leadership behaviors identified by HR professionals in collaboration with a number of managerial employees one year prior to the study. Managers were asked to rate the core leadership behaviors in three ways. First, managers were asked to self-report how they learned each of the 20

skills listed in the questionnaire (1 = did not learn at all from informal learning activities to 4 = learned only from informal learning activities). Second, managers were asked to rate their present proficiency of each managerial skill (1 = extremely poor to 5 = excellent). Third, managers were asked to rate the degree they applied each managerial skill to the job (1 = never to 5 = always). The instrument yielded three scores for each participant. A total Informal Learning score was calculated to indicate the degree to which managers learned core leadership behaviors through informal learning. A Proficiency mean score was calculated to reflect the level of proficiency in core leadership behaviors. Finally, a mean Transfer of Learning score was calculated for each participant that reflected the degree core leadership behaviors were applied to the job. In addition, Section 1 included an open-ended question that asked participants to list the three learning activities that they used most to learn the core leadership behaviors.

Section II of the questionnaire consisted of 32 items that were adapted from Rouiller and Goldstein's (1993) transfer of training climate instrument. Participants responses rated the frequency (5 = always to1 = never) with which various supervisory support (13 items), coworker support (13 items), and organizational support (6 items) actions occurred. The configuration of the scales followed the findings of Holton, Bates, Seyler, and Carvalho (1997) who found no support for the work environment consisting of situational cue and consequence macro dimensions. A mean score for each of the scales (Supervisor Support, Coworker Support, and Organizational Support) was calculated for each participant. Section III of the questionnaire was used to collect demographic information: age, gender, ethnicity, highest level of education completed, years of managerial experience, and business unit. Using the sponsoring company's internal mailing system, the questionnaire along with an informed consent form, and a self-addressed envelope were mailed to members of the sample during the months of October and November of 1997. Participants were given a four-week period to respond.

Limitations. The results of this study may have been limited by several factors: influence of self-report measures, volunteer sample, correlational design, and threat of history. Self-report data is more likely to be accurate if participants perceive the study to be non-threatening (Gable & Wolf, 1993) so participants were assured confidentiality and were told that non-participation in the study would not have any impact on their employment. As a result of the volunteer nature of the sample, the findings are not generalizable beyond the sample (Borg & Gall, 1989). Since this study applied a correlational design, the results did not identify a cause and effect relationship between the independent and dependent variables; the results can only be explained in terms of relationships. The use of a correlational design also posed the threat of a relationship existing between a third unknown variable. Technically, a threat of history cannot exist in a study that does not employ an experimental design. Nevertheless, organizational events that occurred during the data collection phase (e.g., merger, restructuring) may have prompted some participants to view the survey as a tool to assess job performance to be used by human resources to make future employment decisions. Participants who perceived the survey in this way may have inflated their responses to the questionnaire items to portray themselves in a more favorable light or declined to participate. While it is contended that none of these limitations posed a major threat to the results of the study, it is possible that they had some influence on the interpretability of the results.

Results and Findings

Research Question 1. Research Question 1 posed the question: To what extent are managerial job skills learned from formal training and informal learning activities? To answer this question, participants were asked to report the degree to which they had learned each job skill informally. In addition they were asked to identify the three predominant means by which they learned the core leadership skills. The results suggested that managers learned managerial skills mostly from informal learning ($\underline{M}$ = 60, "learned mostly from informal activities", 95% CI: 58,62). Informal Learning scores ranged from 40 ("learned slightly from informal learning activities") to 80 ("learned only from informal learning activities"). The range of scores suggested that no managers learned a skill without the use of informal learning. To further our understanding of the meaning of the Learning Activity Utilization scores, the 247 learning activities reported by managers were classified into two categories: informal learning or formal training. An analysis of the 247 learning activities revealed that 70% (173) of the learning activities pertained to informal learning, while 30% (74) pertained to formal training activities. Of the 173 informal learning activities, 63% pertained to interaction with others, 23% pertained to job experience, 12% pertained to watching others, and 2% pertained to reflection. The 74 formal training activities that participants described pertained to the following: formal classroom training (55%), reading (12%), academic classes (12%), seminars (7%), audio/video (4%), workshops (4%), military (4%), and conferences (1%).

Research Question 2. Research Question 2 posed the question: To what extent do self-reported Proficiency scores, Informal Learning, Supervisor Support, Coworker Support, and Organizational Support scores explain variance in self-reported Transfer of Learning scores? The results of a preliminary residual scatterplot suggested that

all of the assumptions for normality, linearity, and homoscedasticity were met, however, casewise diagnostics results suggested two outliers. After the removal of the two outliers, the hierarchical regression analysis to test Research Question 2 was applied. The order of entry of the independent variables into the regression equation was based on the correlation with the dependent variable. Proficiency (r = . 64), was entered as the first step, followed by Organizational Support (r = .18), Coworker Support (r = .15), Supervisor Support (r = .11), and Informal Learning (r = .01). At the final step, with all variables entered, the regression explained 55% of the variance in Transfer of Learning scores. Proficiency explained 54% of unique variance ($t = 9.1$, $p < .01$), while 1% of unique variance was accounted for by Coworker Support ($t = 1.2$, $p > .05$). The other variables entered into the regression equation did not explain any unique variance (see Table 1).

Table 1. *Hierarchical Regression Analysis For The Independent Variables Total Proficiency, Organizational Support, Coworker Support, Supervisor Support, Total Learning Activity Utilization And The Dependent Variable, Total Transfer of Learning*

Variable	R^2	Unique Variance	Beta Weight (B)	t
Proficiency	.54	.54	.71	9.1**
Organizational Support	.54	.00	.05	.52
Coworker Support	.55	.01	.11	1.2
Supervisor Support	.55	.00	.01	.08
Informal Learning	.55	.00	.06	.71

** $p < .01$

A post-hoc correlation analysis showed that Informal Learning was negatively correlated with Organizational Support ($r = -.46$), Supervisor Support ($r = -.26$), and Coworker Support ($r = -.15$). A hierarchical regression analysis was conducted to clarify the relationship between the variables. Informal Learning was entered as the dependent variable. At the final step, with all variables entered, the regression explained 22% of the variance in Informal Learning. Organizational Support explained 21% of unique variance ($t = 22.4$, $p < .01$), while 1% of unique variance was accounted for by Supervisor Support ($t = -.84$, $p > .05$). Coworker Support did not explain any unique variance ($t = .58$, $p > .05$). In sum, the results indicated that Organizational Support had a medium effect size inverse relationship with informal learning, suggesting that managers who perceived lower levels of Organizational Support perceived more of their learning to be informal.

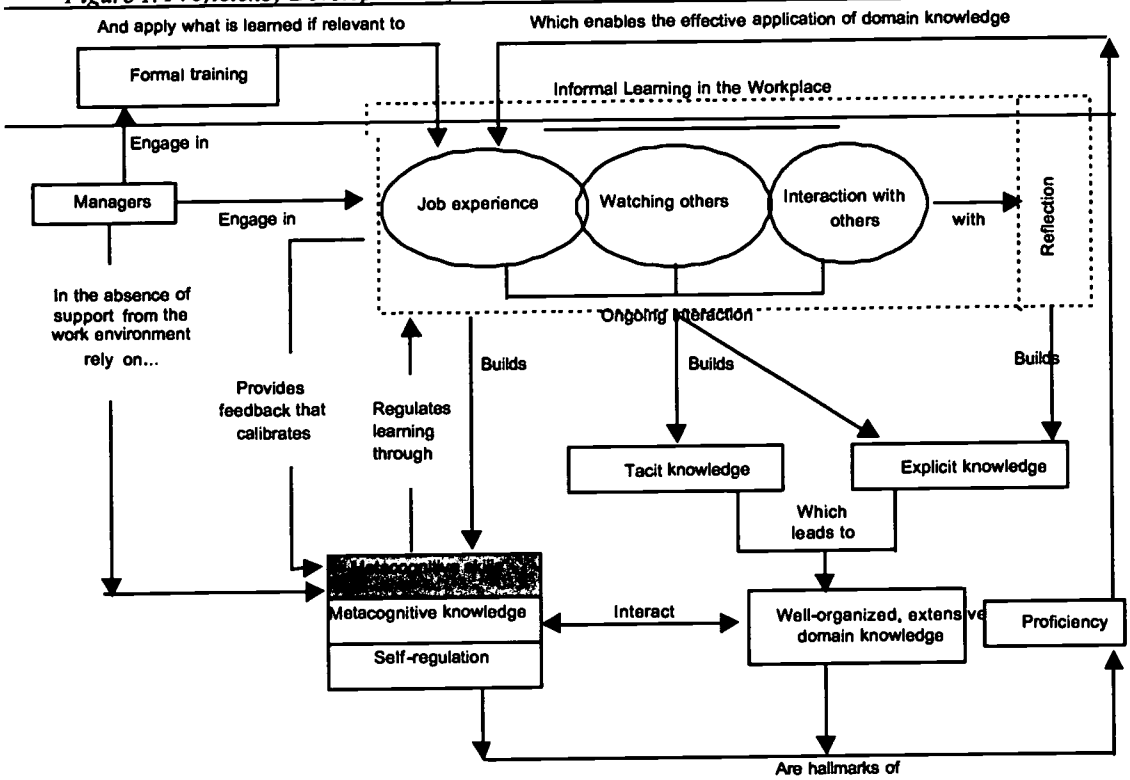
Conclusions. Two conclusions were drawn from Research Question 1 results. First, managers learned managerial skills predominantly through informal learning. Second, "interactions with others" (e.g., interacting with supervisors, coworkers, and subordinates) was the informal learning activity that managers used most to learn managerial skills. Four conclusions were drawn from the results of Research Question 2. First, Proficiency explained 54% of the Transfer of Learning variance. Second, Informal Learning did not explain a significant amount of variance in the Transfer of Learning. Third, elements of the work environment did not explain a significant amount of variance in the Transfer of Learning variance. Fourth, a lack of Organizational Support explained 21% of the variance in Informal Learning.

Conclusions and Recommendations

Two assumptions of the study – managers' proficiency would be strongly related to transfer of learning and managers learn mostly through informal means, were supported by the findings. However, the lack of support for the other two assumptions – that transfer of learning would be strongly related to work environment and that skills learned informally would transfer more readily – prompted a rethinking of our model of managerial learning. This reconceptualization led to the development of a new model (Figure 1) and a new set of propositions concerning the development of managerial proficiency. As outlined in Figure 1, managers in this study developed proficiency through a dynamic, ongoing informal learning process that entailed engaging in job experiences, interacting with others, observing others, and reflection. Informal learning resulted in tacit and explicit knowledge that contributed to well-structured domain knowledge. In the absence of support from the work environment, managers relied on their metacognitive abilities to help regulate participation in informal learning activities. Managers planned, monitored, and evaluated their learning behaviors in relation to their current domain knowledge, and were able to regulate their actions in such a way that enabled progress towards the achievement of their learning objectives (e.g., strategies to

improve the work performance of subordinates). By applying their metacognitive skills, managers were able to further increase their metacognitive proficiency. The two hallmarks of proficiency, metacognitive abilities and well-structured domain knowledge, enabled managers to more effectively apply the knowledge (i.e., proficiency) they gained from informal learning experiences.

Figure 1. Proficiency Development Cycle



Proposition A: Informal Learning is a Continuous Cycle of Challenging Experiences, Action, and Reflection. Following Watkins and Marsick's (1992) theory of informal learning, an argument can be made that the informal learning activities that managers specifically reported were elements that facilitated a broader informal learning process that included both explicit and implicit learning. For example, "job experiences" cited by managers provided specific and challenging work problems which required necessary actions to resolve. Further, "interactions with others" and "watching others" promoted "reflection" and helped managers to make sense of their experiences. These conscious activities were embedded in a deeper, ongoing series of experiences that promoted learning.

Proposition B: Informal Learning is a Social Process. The most prevalent learning activity (44%) that managers reported to build proficiency was "interactions with others" in the workplace. While prior research (e.g. Billet, 1994) has suggested that interaction with peers, supervisors, and subordinates in the workplace are strategies for informal learning, the results in this study are unprecedented due to the wealth of learning that managers reported through these types of interactions.

The tenets of social practice theory help to explain why and how managers in this study learned through their "interactions with others" in the workplace. Lave and Wenger (1991) purported that learning is a social process of participating in work activities and interactions with others that do not exist in isolation, but are part of an integrated set of relations that take on meaning and are situated in the work setting. According to Billet (1994), learning can occur as a result of close guidance from others in the course of work activities. Choo (1998) argued that knowledge can be shared explicitly and implicitly among employees who interact with each other and with the social dimensions of their work tasks and organizational setting. Thus, by observing, assisting, and copying behaviors of experienced practitioners, managers can develop an understanding of the "norms" of a company, and a tacit and explicit understanding of these "norms" can be transferred from one manager to another. The conceptualization of

social practice theory girded by the comments from participants in this study has two important implications for informal learning theory. The first implication is that informal learning is a social process that is largely dependent on social interaction with other individuals in the workplace and is situated in the organization. The second, and perhaps more important implication, is that actions, in concert with interactions with others in the workplace, serve as an important vehicle in which domain-specific knowledge is generated, articulated, and dispersed throughout an organization. This implication suggests that neither action nor interaction alone will result in the building of domain knowledge necessary to become proficient; an integration of action and interaction must exist.

Proposition C: Transfer is a Component of Informal Learning that is Embedded in the Process. The lack of a significant relationship ($r = -.01$) found in this study between informal learning and the transfer of learning raises questions about the actual relationship between the two phenomena. As described by Holton, et al. (1997), transfer of training occurs when a learner is able to take what is learned during formal training and successfully apply it on the job. As evidenced in this definition, a clear demarcation exists between learning (that takes place during formal training) and transfer. But, what is the role of transfer in an informal learning system? When learning is a continuous cycle of challenging experiences, actions, and reflection when does learning stop and when does transfer begin? Results from this study and past research help to provide insight into these questions.

Yelon, Reznich and Sleight (1997) proposed that "a law of exchange" characterizes the transfer process, that is with each application, a learner gathers new knowledge from its implementation, which in turn is used for future applications. In essence, the study suggested a dynamic process of transfer that entailed individuals learning informally from their applications. If the contention that transfer is a component of the informal learning process stands, why wasn't such a relationship demonstrated by the results of the study? Similar to past studies (e.g., Rouiller & Goldstein, 1993; Tracey, et al., 1995) transfer of learning in this study was measured as a one dimensional "product." The single dimensional approach used to measure transfer made it difficult to detect differences in transfer associated with learning methods.

Proposition D: Metacognitive Skills Moderate Informal Learning and the Application of Learned Skills. Contrary to past research, the results of this study suggested work environment factors did not play a significant role in how managers learned and transferred skills. If learning and transfer were not influenced by external factors, what internal mechanisms enabled managers to learn and transfer skills? Ertmer and Newby (1996) argued that self-regulation involves the recursive and interactive process of identifying actions to facilitate the achievement of a task (i.e., planning), paying mindful attention to the strategies that are employed to achieve a task (i.e., monitoring), and assessing the outcomes of the actions that are deployed to achieve a task (i.e., evaluation). The self-regulation process is guided by metacognitive knowledge. Metacognitive knowledge entails individuals' awareness of their strengths and weaknesses as learners, requirements to succeed in a task, obstacles in the environment that might interfere in accomplishing a task, and cognitive strategies that might lead to success (Ertmer & Newby, 1996). Metacognitive knowledge and self-regulation work together in a dynamic fashion to produce effective learning. Metacognitive knowledge provides individuals with information about a specific task, its demands, and what it will take to accomplish the task. Self-regulation, on the other hand, serves as a mechanism that controls the application of metacognitive knowledge and helps reduce the gap between an individual's current and desired abilities (Ertmer & Newby, 1996).

Two results from this study allow for speculation that metacognitive knowledge and self-regulation played roles in how managers learned and transferred learning. First, the results of a post hoc analysis showed that an inverse relationship existed between organizational support and informal learning ($\beta = -.46$). In the absence of organizational support (i.e., supplies, learning aids, and rewards to assist in the transfer of learning), participants made a deliberate effort to engage in informal learning activities to achieve the knowledge and proficiency necessary to carry out required job tasks. Following this interpretation, managers' metacognitive knowledge may have helped them to detect a discrepancy between the managerial tasks they needed to accomplish, their current abilities to accomplish the tasks (i.e., domain knowledge), and the support that their environment provided to carry out these tasks. In order to reduce the gap between their current domain knowledge and required knowledge, managers may have actively sought out, created, and recognized informal learning opportunities (i.e., self-regulation) to develop their managerial proficiency.

Practical Implications for HRD Practitioners

Today's companies rely mostly on formal training to develop the proficiency of managers. Unfortunately, the use of formal training programs to develop the proficiency of managers has not paid dividends, as most skills that are learned during formal training are rarely applied on the job (Pfeffer & Sutton, 2000). Based on this study's findings,

two implications are offered for HRD practitioners who face the challenging task of developing the proficiency of managers in their organization.

Implication 1. Shift the focus away from formal training of managers and develop more realistic expectations concerning the application of what is learned through formal training. Recognize and leverage the abundance of informal learning opportunities that managers experience and focus on developing managerial proficiency and expertise.

Opportunities for informal learning such as interactions with others in the workplace, observing others, and challenging job assignments must be harnessed and leveraged. In addition to developing explicit and implicit knowledge, these types of activities over a period of time are more apt to result in the development of proficiency. In order to facilitate managerial proficiency in the workplace, managers need to be in an environment where informal learning is encouraged and strategies and activities that promote informal learning (i.e., reflection and challenging experiences) are made available (Sheckley & Keeton, 1997).

Implication 2. Develop the metacognitive skills of managers.

Managers that have superior metacognitive skills will be more likely to engage in and seek out informal learning opportunities and effectively transfer skills that they have learned. Past research supports two approaches to developing self-regulation (Smith, et al., 1997). The first approach is to give the learner control over the content, sequence, and pace of learning. Sternberg (1989) argued that giving learners control over their learning can lead to a more motivated and involved learner. A second approach to promoting managers' self-regulation is generating a mastery orientation. Mastery orientation differs from a performance orientation in that the focus of learning is on developing proficiency of a skill, not on outperforming peers (Smith, Ford, & Kozlowski, 1997).

How This Research Contributes to New Knowledge in HRD

The fast pace in which corporations operate today, and the need for companies to remain competitive, has unloaded a heavy burden on organizations, managers, and HRD practitioners. The prevailing belief among organizations and HRD practitioners today is that increased spending on formal training will result in more effective managerial performance and ultimately, increased revenue for the company (Bassi & Van Burren, 1999). While there is some evidence that shows that companies that heavily invest in training are more successful than those that don't (Bassi & Van Burren, 1999), this study demonstrated that formal training is not the ultimate source of learning and the transfer of learning.

Organizations and HRD practitioners would be well-served to rethink their approach to managerial learning and proficiency. This study suggested that managers learn mostly from informal learning, proficiency is the product of informal learning, and that self-regulation moderates informal learning and the transfer process. In light of these findings, companies should harness and leverage informal learning and cultivate the metacognitive abilities of managers, as opposed to increasing spending on formal training programs. By applying these approaches, companies may save money, develop more proficient managers, and gain a competitive advantage.

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