# Informal Learning and the Transfer of Learning: How Managers Develop Proficiency

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*This study examined how the extent to which managers engaged in informal learning, perceptions of support in the transfer environment, and level of managerial proficiency related to transfer of learning in twenty core managerial skills. The results suggested that informal learning is predominantly a social process and that managers with high levels of proficiency who experience low levels of coworker, supervisor, and organizational support learn managerial skills mostly from informal learning and transfer learning more frequently. New perspectives are offered on the interrelationship between informal learning and transfer of learning, the role of metacognition and self-regulation in informal learning, and the influence of informal learning in the development of managerial proficiency.*

Corporate managers require complex cognitive skills in order to work effectively with highly technical systems, interpersonal skills to work competently in teams, and leadership skills to manage effectively (Carnevale & Desrochers, 1999). For the past few decades, the most frequently selected solution to improving managerial proficiency has been to send managers to formal training programs, such as classes, conferences, and computer-based training. In 1998, an estimated 5.3 million managers attended formal training, resulting in 166.2 million hours of managerial training (Bassi & Van Buren, 1999). In recent years, critics of formal training programs have claimed that formal training does not prepare managers to keep pace with the constant change that occurs in today's workplace (Hartley, 2000) and does not provide managers with sufficient real-world experience to develop proficiency (Sheckley & Keeton, 1999). Concurrently, research focused on the impact of informal learning in the work environment (for example, through social interactions, peer mentoring, shift change, and team meetings) on managers' skill development is on

the rise (Watkins & Marsick, 1992; Marsick & Volpe, 1999). Despite the prevalence of informal learning in the workplace (Day, 1998), researchers have focused transfer-of-training research primarily on the transfer of skills learned during formal training (Rouiller & Goldstein, 1993). The purpose of study examined here was to investigate the relationships among formal training, informal learning, managerial proficiency, transfer climate, and transfer of learning among corporate managers. Understanding these complex relationships may enable organizations to maximize the development of managerial proficiency, reduce costs, ensure a more productive workforce, and, ultimately, enhance their competitive advantage.

## Literature Review

Proficiency, a manager's ability to apply knowledge skillfully, has been cited as a leveraging point to gain competitive advantage. Organizations continue to pursue formal training to develop managerial knowledge, but they are beginning to question the relative contribution of formal training compared to the contribution of informal learning to the development of managerial skills. A key issue associated with the effectiveness of both formal and informal learning is the degree to which transfer of learning, that is, the generalization and use of acquired knowledge to a wide variety of managerial scenarios (Laker, 1990), occurs. Furthermore, organizations are challenged to design learning transfer systems to support and enhance transfer of learning in the organization (Holton & Baldwin, 2000). Rouiller and Goldstein (1993) point out that a critical aspect of the learning transfer system is the transfer climate, that is, "situations and consequences that either inhibit or help to facilitate the transfer" (p. 379) of learning.

*Formal Training and Informal Learning.* Watkins and Marsick (1992) offer a theory of learning in organizations that distinguishes formal training from informal learning. Formal training occurs in the absence of action; learners are removed from the day-to-day work to engage in lectures, discussions, simulations, role plays, and other instructional activities. Formal classroom training is the mode of instruction most widely used by corporations to develop managers (Bassi & Van Buren, 1999), but researchers suggest that most managerial learning takes place informally (Lowy, Kelleher, & Finestone, 1986; McCall, Lombardo, & Morrison, 1988). Informal learning occurs in the presence of both action and reflection (Watkins & Marsick, 1992) and includes "self-directed learning, networking, coaching, mentoring, performance planning . . . and trial-and-error" (p. 291).

The conceptual framework for informal learning is grounded in experiential learning theory, pioneered by Dewey (1938) and later expanded on by the work of Kolb (1984) and others. In contrast to formal training, which is structured learning that takes place in a classroom environment, informal learning occurs as the result of individuals' making sense of experiences they encounter

during their daily work lives (Marsick & Volpe, 1999). Studies that have investigated managerial informal learning in the workplace have demonstrated its pervasiveness. For example, McCall et al. (1988) found that of thirty-five managerial job skills (for example, negotiating skills), managers developed thirty of them through informal learning (for example, job assignments). The problem that HRD practitioners face is that reliance on formal training programs may result in a loss of competitive advantage if managers are not able to transfer what they have learned in formal training to their work. At the same time, overreliance on formal training may deemphasize the value of harnessing informal learning opportunities to promote managerial proficiency.

*Proficiency.* Proficiency, which is the ability to apply knowledge within a particular domain skillfully (Sheckley & Keeton, 1999), is the primary objective of both formal and informal learning undertakings in organizations. Researchers (Chi, Feltovich, & Glaser, 1981; Kraiger, Ford, & Salas, 1993) suggest that individuals who are proficient within a particular domain have an extensive and well-organized knowledge base that is constructed through experience. Proficiency development models (examples are those of Chi et al., 1981, and Ertmer & Newby, 1996) show that proficiency is largely developed through informal learning activities that are characterized by action and reflection (Seibert & Daudelin, 1999).

When a knowledge structure is robust, strong links between problem types and specific solutions exist, enabling transfer of learning. For example, Stokes, Kemper, and Kite (1997) found that pilots with more flight experience performed better on a simulated flight test (that is, a transfer task) than did their novice counterparts ($d = 1.2$). And Gick and Holyoak (1983) found that 58 percent of individuals with better-quality schemas (an indicator of a well-organized knowledge base) were able to solve a target problem compared to 29 percent of participants who had poor schemas. Although past HRD studies have not investigated the association between managerial proficiency and the transfer of learning, indications from studies in other disciplines suggest a strong relationship. An inquiry into the role that proficiency plays in the transfer of learning may shift the focus of workplace learning programs from the acquisition of knowledge to developing proficiency, or the ability to apply knowledge skillfully.

*Transfer of Learning.* Transfer of learning has been defined as the degree to which trainees apply knowledge, skills, and attitudes they gain in training to their jobs (Holton, Bates, Seyler, & Carvalho, 1997). The pivotal role that making connections between past experiences and current problems plays in supporting transfer of learning is a centerpiece of common elements theory of transfer (Butterfield & Nelson, 1989). Outcomes of several research studies support common elements theory (Yorks et al., 1998) and have demonstrated that commonalities between the learning situations and the actual work situations for the participants resulted in greater transfer of learning. For example, Stolovitch and Yapi (1997) found a large effect size ($d = 2.4$) in transfer

between participants who participated in a case study method of training that involved strong links between training and the transfer task and participants who did not participate in case method training.

Transfer-of-learning research to date has focused primarily on the transfer of skills learned during formal training (Rouiller & Goldstein, 1993). Because skills learned informally are likely to share similar features with transfer tasks in terms of context and content, the potential exists for skills learned informally to be more readily transferred than skills learned in formal training contexts. Yet the lack of research examining factors that influence the transfer of informal learning leaves human resource practitioners with unanswered questions about ways to ensure that managers apply what they learn informally.

*Transfer Climate.* Most current models of transfer of learning include the workplace climate for transfer as an important factor in the transfer equation. Transfer-of-learning theorists (Ford & Weissbein, 1997; Holton & Baldwin, 2000; Rouiller & Goldstein, 1993) define transfer climate as the individual or group perceptions and interpretations of the conditions and processes within an organization that promote or inhibit transfer-of-learning efforts. Rouiller and Goldstein (1993) offer a theory for transfer of learning that emphasizes the role of coworker support, supervisor support, and organizational support as climate factors that provide consequences and cues that may support or inhibit the use of acquired managerial skills on the job.

Over the past decade, a number of researchers have investigated relationships between transfer climate factors and the transfer of training from formal training programs. For example, Brinkerhoff and Montesino (1995) found that individuals who reported higher levels of supervisor intervention indicated more transfer of learning than those who reported lower levels of supervisor intervention. Facteau, Dobbins, Russell, and Kudisch (1995) found that coworker support had a moderately large effect ($r = .56$) on perceived training transfer. Studies conducted to date have examined almost exclusively the relationships between transfer climate and the transfer of learning from formal training programs. Questions remain concerning the role that transfer climate plays in the transfer process when managers learn skills informally.

## Research Questions

To learn more about the relationships among formal training, informal learning, managerial proficiency, transfer of learning, and transfer climate, the study focused on three research questions:

RESEARCH QUESTION 1: *To what extent and in what ways did managers learn core managerial skills through formal training and informal learning?*

RESEARCH QUESTION 2: *What is the relationship of perceived transfer of learning with perceived proficiency and with extent of informal learning?*

RESEARCH QUESTION 3: *What is the relationship of perceived transfer climate supports with perceived transfer of learning and with extent of informal learning?*

## Methods

We used a one-group descriptive survey approach to answer the research questions. This method allowed us to explore how the variables of interest were related for a purposefully selected group of managers with data collected from a self-report questionnaire.

*Setting.* This study was conducted with managers who worked at a large subsidiary of a hundred-year-old Fortune 100 company located in New England. The company, a leading provider of insurance products that employed approximately twenty thousand employees, was experiencing rapid growth, deep change, and extensive mergers. The company offered a wide variety of formal training programs for managers centered on developing proficiency in identified core management behaviors, and it encouraged managers to use informal learning opportunities to develop their skills. This site was selected for the study because of the strong emphasis the firm placed on managerial development, its desire to form a research partnership, and its interest in the outcomes of the study ( Jacobs, 1997).

*Sample.* The population of managers in the organization was approximately forty-five hundred at the time of the study. Because one of the objectives of the study was to measure perceptions of the extent to which managers learned job skills from formal and informal learning activities, we purposefully selected managers from a range of departments who had participated in both types of learning activities. Due to the ubiquitous nature of informal learning in a workplace (Day, 1998), we were confident in assuming that any member of the population had engaged in informal learning. To ensure that participants had also engaged in formal learning, we selected a sample of 188 local managers who participated in company-sponsored leadership training courses offered over the previous three years.

Of the 188 managers invited to participate, 45 percent (84) took part by completing a questionnaire developed for the study. The participants were 60 (71 percent) women and 24 (29 percent) men, and their average age was forty-two years. Participants had an average of ten years of managerial experience (30 percent had one to five years of managerial experience, 38 percent had six to ten years, and 32 percent had eleven or more years). Most participants (43 percent) had a bachelor's degree, and 23 percent held a master's or doctoral degree.

*Measures.* One year prior to the study, in an effort independent of the study, HR professionals employed by the company conducted focus group interviews of managerial employees to identify essential core managerial skills. This process resulted in a list of twenty distinct core skills associated with successful completion of managerial duties at the organization. For each item,

participants were asked to rate how they learned the skill, their proficiency of each skill, and the degree to which they apply the skill to the job. The advantage of using the organization-specific list was that it enhanced the content validity of measures in a way that a preestablished list of more generic managerial skills, such as the Campbell Leadership Descriptor scales (Campbell, 2002), could not.

*Proficiency.* The measure of perceived proficiency in managerial skills was obtained by asking participants to rate the extent of their proficiency in each of the twenty managerial skills using a five-point scale (1 = extremely poor proficiency, 2 = below-average proficiency, 3 = average proficiency, 4 = above-average proficiency, 5 = excellent proficiency). The Proficiency score was calculated by averaging the response ratings to the twenty skill items. The internal consistency of responses to the Proficiency items was high (Cronbach's alpha = .89).

*Extent of Informal Learning.* Extent of Informal Learning was measured on a four-point scale (1 = learned only from formal learning activities, 2 = learned mostly from formal learning activities, 3 = learned mostly from informal learning activities, 4 = learned only from informal learning activities). For each managerial skill, participants rated the extent to which they perceived they learned the skill through informal learning activities. The Extent of Informal Learning score represented the average of the ratings to the twenty skill items. The responses to these twenty items demonstrated high internal consistency (Cronbach's alpha = .93).

*Transfer Climate.* The researchers used thirty-two items adapted from Rouiller and Goldstein's Transfer of Training Climate instrument (1993) to assess perceptions of transfer climate. The within-group inter-rater reliabilities for the climate scales obtained by Rouiller and Goldstein ranged from .53 to .91 (*n* = 273). Prior to our study, a series of steps were taken to establish the validity of the adapted instrument, including an initial screening for content validity by experts in the workplace learning field, as well as a team of human resource professionals employed by the study's sponsoring company. In addition, the instrument was pilot-tested with twenty managers from the sponsoring company who were not part of the final sample, which informed refinement of the instrument format and procedures. Furthermore, using sample response scores, instrument items were analyzed applying principal components factor analysis, applying orthogonal rotation so that factors of the analysis would not be correlated. The employment of factor analysis resulted in three factors: Coworker Support, Supervisor Support, and Organizational Support. These factors were selected based on Kaiser's criterion, where all factors with an eigenvalue greater than or equal to one are retained; scree plot results showed the number of factors plotted against eigenvalues stabilized at the third factor (Tabachnick & Fidell, 1996). Factor loadings for items within each factor were greater than .58. The three resulting factors derived from the factor analysis were similar in content to factors found in past assessments

of transfer climate items (Holton et al., 1997; Holton, Bates, Ruona, & Leimbach, 1998).

In the current study, Coworker Support (the degree to which coworkers provided managers with support, verbal rewards, and assistance to apply learned skills to the job) was measured with thirteen items, such as, "My coworkers and I set goals to apply managerial skills" with high internal consistency (Cronbach's alpha = .93). Supervisor Support (the degree to which supervisors provided managers with support, verbal rewards, and assistance to apply learned skills to the job) was assessed using thirteen items also, with high internal consistency (Cronbach's alpha = .95). An example of an item from this scale was, "Immediate supervisor discusses with me ways to apply managerial skills." Finally, Organizational Support (the degree to which managers had access to supplies, monetary rewards, and job alignment that assisted them in transfer of learning) included six items, such as, "In my workplace resources are available to help apply managerial skills," and demonstrated acceptable internal consistency (Cronbach's alpha = .85). For each item related to transfer climate, participants rated on a five-point scale their perception of the frequency that the support actions occurred in their work environment (1 = never, 2 = rarely, 3 = sometimes, 4 = very often, and 5 = always). The three scale scores (Supervisor Support, Coworker Support, and Organizational Support) were obtained by calculating the mean response score for items in each factor.

*Transfer of Learning.* Transfer of Learning, the dependent variable, was a measure of participants' perceptions of the degree to which they applied each of the twenty core managerial skills on the job. Perceptions were measured using a five-point scale: 1 = never, 2 = rarely, 3 = sometimes, 4 = very often, and 5 = always. The Transfer of Learning score was calculated by averaging a participant's response values to the twenty items. The internal consistency of the Transfer of Learning responses was high (Cronbach's alpha = .87).

*Learning Activities Used Most Frequently.* In the final section of the questionnaire, participants responded to the open-ended question: "Please list three specific learning activities (e.g., classroom training, interaction with coworkers) that you have used the most to learn managerial skills." We used this nominal information in formulating our answer to Research Question 1 regarding the extent to which managers perceived that they learned job skills from formal training and informal learning activities.

**Procedures.** All data were collected using a single self-report questionnaire. Using the sponsoring company's internal mailing system, the questionnaire, along with an informed confidentiality and consent form and a self-addressed envelope, were mailed to 188 managers during October and November 1997. The managers were given a four-week period to take part in the study. Eighty participants sent their completed questionnaires to a mailbox within the sponsoring company assigned to the researcher of the study. Approximately two weeks after the initial mailing, a reminder letter, along

with another copy of the questionnaire and self-addressed envelope, was mailed to all individuals, resulting in four additional completed questionnaires, for a total of 84 participants ($n = 84$).

In an effort to assess the degree to which selection bias may have had an impact on the study (Borg & Gall, 1989), an abbreviated version of the questionnaire, with an informed consent form and cover letter, was mailed to all managers in the sample in January 1998. The cover letter clearly requested a response from managers who had not returned the original questionnaire. Fifteen individuals completed and returned the abbreviated questionnaire during the three-week period of time allotted for its return, comprising the nonrespondent group. *T* test and chi-square analysis of differences between the respondent group ($n = 84$) and the nonrespondent group ($n = 15$) indicated that the nonrespondents did not differ significantly from the respondents in demographic characteristics (age, years of managerial experience, gender, area of business).

The researchers' Institutional Review Board approved the instruments and procedures for the study. In the informed-consent form, potential participants were ensured that their decision to respond to the questionnaire was completely voluntary and entirely independent of any work-related responsibilities or evaluations and that the content of their responses would remain confidential and reported in aggregate form only.

*Data Analyses.* Popham and Sirotnik (1992) state that parametric procedures may be applied to ordinal-level data if other assumptions for each statistical procedure have been met. Consistent with these guidelines, we first assessed normality in distribution of data for each variable and linearity between variables and found them to be within acceptable limits. Descriptive statistics were used to obtain a profile of the sample and to delineate the distribution of scores for the study variables. A Pearson product-moment correlation matrix was obtained for all variables to examine how each related to the others in terms of strength and direction. All statistical null hypothesis tests were set at the $p = .05$ level of significance. Since past research investigating work environment variables has demonstrated medium (Tracey, Tannenbaum, & Kavanaugh, 1995) to large effect sizes (Rouiller & Goldstein, 1993), a sample size of 84 was sufficient to ensure a .80 probability of avoiding a type II error at the .05 level (Cohen, 1988).

We formulated our response to Research Question 1 using the Extent of Informal Learning mean values for each job skill and frequency distributions for specific informal and formal learning activities identified by participants. Research Questions 2, 3, and 4 were answered using correlational analyses.

## Results

A discussion of the results generated from the research questions in our study is provided here.

*Research Question 1: Extent and Ways Managers Learned Core Managerial Skills Through Formal Training and Informal Learning.* The overall mean for Extent of Informal Learning ($M = 3.0$, $SD = .40$) indicated that managers consistently reported learning the twenty core managerial skills mostly from informal learning activities. Figure 1 shows a comparison of the number of managers reporting that they learned each specific managerial skill formally and informally. The distribution indicates that managers reported learning all twenty skills predominantly from informal learning activities. Further review showed that the percentage of managers who indicated that they learned from informal learning activities dropped below 70 percent for only four managerial skills, while the percentage of managers who indicated that they learned from formal learning activities reached higher than 20 percent for only seven managerial skills.

In response to the open-ended question ("What three specific learning activities did you use most to learn core leadership skills?"), the 84 managers reported 247 different learning activities. Using definitions from the literature (Bassi & Van Buren, 1999; Day, 1998), we classified the 247 activities into two categories: informal learning or formal training. The results of this classification indicated that 70 percent (173) of the learning activities pertained to informal learning and 30 percent (74) to formal training. Of the 173 informal learning activities, 63 percent pertained to interaction with others, 23 percent pertained to job experience, 12 percent pertained to watching others, and 2 percent pertained to reflection. The 74 formal training activities described by the managers included formal classroom training (55 percent), reading (12 percent), academic classes (12 percent), seminars (7 percent), audio and video material (4 percent), workshops (4 percent), military experience (4 percent), and conferences (1 percent).

**Figure 1. Core Managerial Skills and Frequency Distribution of Extent to Which Participants Reported Learning Each Skill Formally and Informally ($n = 84$)**
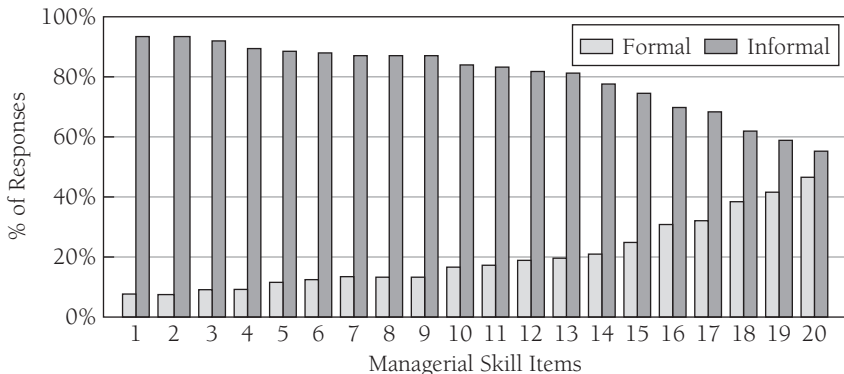
*Research Question 2: Relationship of Perceived Transfer of Learning with Perceived Proficiency and with Extent of Informal Learning.* The managers reported that they very often applied the core managerial skills, indicated by the mean Transfer of Learning value of 4.0 ($SD$ = .39). In addition, the managers reported overall above-average proficiency ($M$ = 3.8, $SD$ = .43) in the core managerial skills. Proficiency was the only variable that had a strong and statistically significant relationship with Transfer of Learning ($r$ = .64, $p$ < .01). (See Table 1 for descriptive statistics and intercorrelations for all variables.) Managers who reported applying managerial skills more frequently to their jobs also reported higher levels of proficiency in those skills.

Although the managers reported that they very often applied the core managerial skills on the job and that they learned the twenty core managerial skills predominantly through informal learning, these two activities were not related. The correlation coefficient between Transfer of Learning scores and Extent of Informal Learning scores was $r$ = −.01.

*Research Question 3: Relationship of Perceived Transfer Climate Supports with Perceived Transfer of Learning and with Extent of Informal Learning.* Moderate intercorrelations (range: $r$ = .40 to .43) among the three transfer climate factors (Coworker Support, Supervisor Support, and Organizational Support) suggested that managers perceived the three types of support to overlap to some extent. The mean response to each factor indicated that managers perceived coworker support ($M$ = 2.3, $SD$ = .75) to occur rarely and supervisor support ($M$ = 2.7, $SD$ = .85) and organizational support ($M$ = 2.9, $SD$ = .68) to occur sometimes in their work environments. The three transfer climate variables showed low nonsignificant correlations with Transfer of Learning—Coworker Support ($r$ = .15), Supervisor Support ($r$ = .11), and Organizational Support ($r$ = .18)—and suggested that perceptions of transfer climate supports were minimally related to the extent to which the managers applied each of the twenty core managerial skills on the job.

Each of the transfer climate factors had a small to moderate negative relationship with Extent of Informal Learning scores ($r$ = −.15, *ns* with Coworker Support, $r$ = −.26, $p$ < .05 with Supervisor Support, and $r$ = −.46, $p$ < .01 with Organizational Support). These relationships suggested that managers

### Table 1. Descriptive Statistics and Intercorrelation Matrix for All Variables ($n$ = 84)

| Variables | Mean | SD | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| 1. Proficiency | 3.8 | .43 | | | | | |
| 2. Extent of Informal Learning | 3.0 | .40 | .06 | | | | |
| 3. Coworker Support | 2.3 | .75 | .04 | −.15 | | | |
| 4. Supervisor Support | 2.7 | .85 | .09 | −.26* | .43** | | |
| 5. Organizational Support | 2.9 | .68 | .14 | −.46** | .40** | .41** | |
| 6. Transfer of Learning | 4.0 | .39 | .64** | −.01 | .15 | .11 | .18 |

*$p$ < .05. **$p$ < .01.

who perceived lower levels of transfer climate support, particularly with regard to organizational support, used more informal learning strategies.

## Discussion

We used the results of the data analysis and the literature to formulate propositions concerning the development of managerial proficiency. Figure 2, a proposed conceptual model of how managers develop proficiency, incorporates the five propositions.

PROPOSITION A: *Informal learning for managers is a continuous cycle of challenging experiences, action, and reflection.*
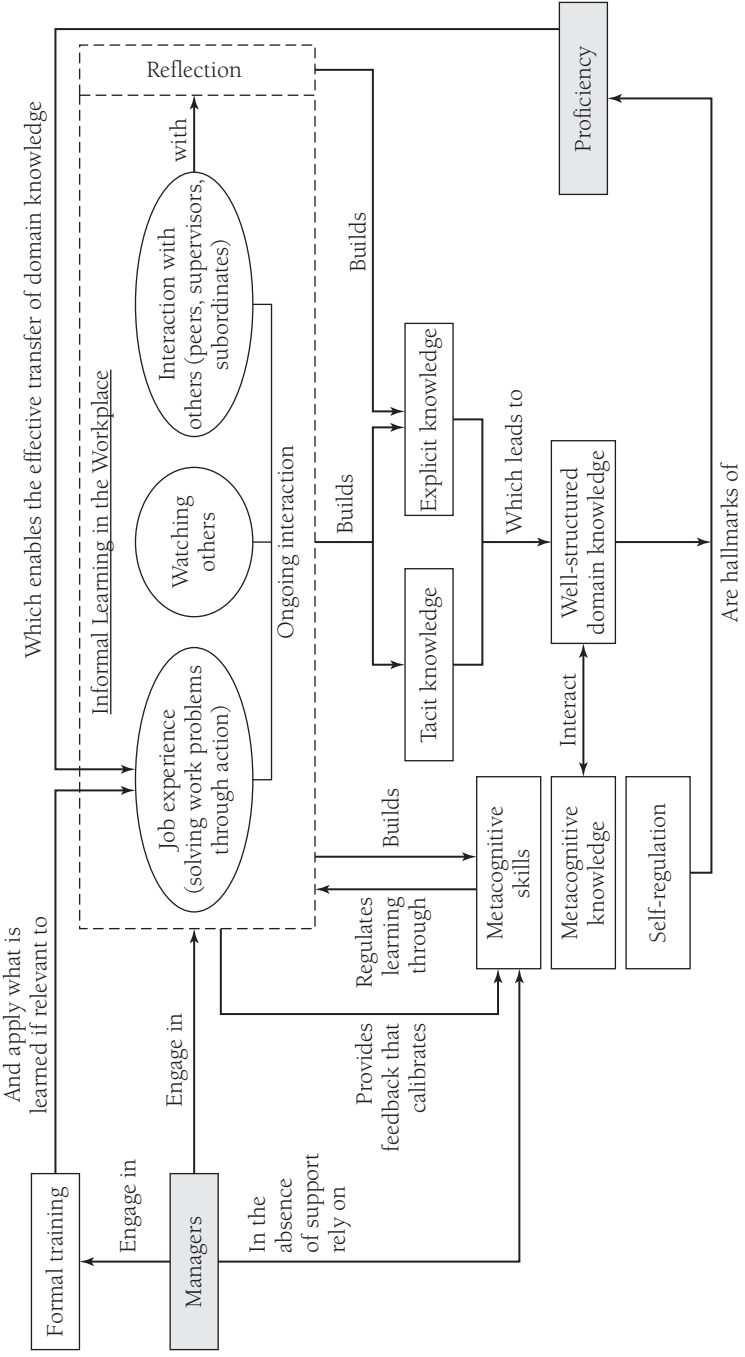
Following Watkins and Marsick's theory of informal learning (1992), we interpreted the specific informal learning activities reported by managers to be elements of a broader informal learning process, cyclical in nature, which included both explicit and implicit learning. For example, "job experiences" cited by managers provided specific and challenging work problems that required action to resolve. "Interactions with others" and "watching others" promoted "reflection" and helped managers to make sense of their experiences, which they applied to new challenges. The conscious informal learning activities were embedded in a deeper, ongoing series of experiences characterized by both explicit and implicit learning (Seibert & Daudelin, 1999).

PROPOSITION B: *Informal learning for managers is a social process.*

The most prevalent learning activity (44 percent) that managers reported to build proficiency was "interactions with others" in the workplace. While prior researchers (Billet, 1994) have suggested that interactions with peers, supervisors, and subordinates in the workplace are strategies for informal learning, the results in this study are unique 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 could 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

**Figure 2. How Managers Develop Proficiency**

Which enables the effective transfer of domain knowledge

Reflection

Informal Learning in the Workplace

Interaction with
others (peers, supervisors,
subordinates)

with

Watching
others

Job experience
(solving work problems
through action)

Ongoing interaction

Builds

Builds

Builds

Explicit knowledge

Tacit knowledge

Which leads to

Well-structured
domain knowledge

Interact

Are hallmarks of

Proficiency

Builds

Metacognitive
skills

Metacognitive
knowledge

Self-regulation

Regulates
learning
through

Provides
feedback that
calibrates

And apply what is
learned if relevant to

Engage in

In the
absence
of support
rely on

Formal training

Engage in

Managers

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 of learning for managers is a component of informal learning that is embedded in the informal learning process.*

The lack of a significant positive relationship ($r = -.01$) in this study between extent of 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 previous 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 (Brinkerhoff & Montesino, 1995; 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: *Managers' metacognitive skills moderate informal learning and the application of learned skills.*

Contrary to past research, the results of this study suggested that transfer climate factors did not play a significant role in how managers learned and

transferred skills. If learning and transfer were not influenced by climate factors, what internal mechanisms enabled managers to learn and transfer skills? Previous research in the area of self-regulation and metacognition provided a way of addressing this question and interpreting our outcomes.

Metacognitive knowledge and self-regulation work together in a dynamic fashion to produce effective learning. Metacognitive knowledge (Schraw, 1998) provides individuals with information about a specific task, its demands, and what it will take to accomplish the task. Self-regulation 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). In the course of self-regulation, individuals receive an influx of internal feedback with regard to progress being made in reaching their intended goals. This feedback in turn informs individuals as to whether to modify or adhere to current problem-solving strategies (Butler & Winne, 1995).

Two results from this study allow for speculation that metacognitive knowledge and self-regulation influenced how managers learned and transferred learning. First, we found a moderate inverse relationship between organizational support and informal learning ($r = -.46$). In the absence of organizational support for transfer, 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 (that is, 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 applied self-regulation skills to seek out, create, and recognize informal learning opportunities to develop their managerial proficiency.

Second, in contrast to past studies (Rouiller & Goldstein, 1993; Tracey et al., 1995), the results of this study suggested that transfer climate factors did not relate significantly with transfer of learning. According to Gagné (1994) and Schraw (1998), proficient individuals, in comparison to novices, have superior metacognitive abilities built from prior applications of metacognitive skills. The managers in this study were seasoned and indicated high levels of managerial proficiency. Therefore, it is plausible that they were able to rely on their own internal mechanisms to develop and transfer skills even under minimally supportive conditions. Research has shown that metacognitive skills help proficient individuals to determine when, where, and why to apply knowledge and actions (Xiao, Milgram, & Doyle, 1997). Based on this research, we offer that the transfer behavior of managers in this study was mediated by their metacognitive skills rather than transfer climate. We propose that when confronted with problem situations, managers were able to identify the necessary actions to alleviate the problem (metacognitive knowledge) and

successfully select, control, and monitor their actions (self-regulation) in order to achieve their desired objectives.

PROPOSITION E: *Managerial proficiency is the product of the informal learning process and the transfer of learning.*

According to Sheckley and Keeton (1999), individuals develop proficiency by working in challenging and supportive environments, self-monitoring, engaging in deliberate practice, and solving ill-defined problems. Our results add to the work of Sheckley and Keeton (1999) by suggesting that proficiency is also the result of informal learning and that proficiency and transfer of learning have a strong reciprocal relationship. For example, when faced with difficult work-related problems, managers applied specific strategies (transfer) that they had learned from previous experiences (such as interactions with peers). As an outcome of these applications (transfer), managers' understanding of the effectiveness of the strategy may have become more robust, leading to proficiency. Demonstrated in this example, transfer entails the strategies that the managers applied and serves as a learning activity within the broader informal learning process. As a result of each application of knowledge, managers continue to learn informally, and the proficiency cycle is kept in motion.

The results of this study are limited in the following ways. First, our application of a correlational design precluded us from making any assumptions about cause-and-effect relationships among the variables we studied. Second, we may have overestimated the magnitude of these relationships and therefore selected a sample size that subsequently lacked the statistical power necessary to detect smaller relationships (Cohen, 1988). For example, contrary to our expectations, we failed to find correlation values of significant magnitude between perceptions of support in the transfer climate and transfer of learning. Third, the self-report nature of the study posed a moderate threat to the accuracy and interpretability of the results. According to Gable and Wolf (1993), self-report data are more likely to be accurate if participants perceive the study as being nonthreatening; therefore, for this study, participants were assured of confidentiality and were told that participation or nonparticipation in the study would have no impact on their employment. Finally, sampling procedures limit the extent to which the results can be interpreted and generalized. Potential participants were not randomly selected, and the final sample was dependent on volunteers. Although our interpretation of the data from this sample has led to the development of a new set of propositions about relationships among informal learning, transfer of learning, and managerial proficiency and to the conceptualization of a model of how managers develop proficiency, we are cautious about generalizing our findings to managers in other settings and with different demographic characteristics. We encourage our HRD colleagues to be cautious as

well and invite others to test our propositions and explore our model with new samples of managers.

## Implications for Practice and Future Research

Based on the findings of this study, we offer two implications for practice and future research for management development practitioners and researchers who face the challenging task of developing the proficiency of managers in organizations.

The first implication is to 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 time are more likely to result in the development of proficiency. 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 (reflection and challenging experiences) are made available (Sheckley & Keeton, 1999). Future research could be focused on exploring methods and effectiveness for harnessing and leveraging informal learning and developing a better understanding of transfer climates that promote the transfer of skills learned informally.

The second implication is to develop managers' metacognitive skills. Managers who have superior metacognitive skills will be more likely to seek out and engage in informal learning opportunities and effectively transfer skills that they have learned. Other researchers (Smith, Ford, & Kozlowski, 1997) support two approaches to developing metacognitive and self-regulation skills. The first approach is giving learners control over the content, sequence, and pace of learning. Sternberg (1989) argued that giving learners control over their learning could result in more motivated and involved learners. A second approach is generating a mastery orientation toward learning and transfer of learning. Mastery orientation differs from a performance orientation in that the focus of learning is on developing proficiency, not on outperforming peers or making a quota (Smith et al., 1997). Research to identify specific aspects of managerial metacognition and the role of metacognition in enhancing workplace learning would expand our understanding of managerial and employee development.

## Conclusion

The fast pace at 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 is that increased spending on formal training will result in more effective managerial performance and ultimately increased revenue for the organization (Bassi & Van Burren, 1999). Although some companies that invest heavily in training are more successful than those that do not (Bassi & Van Burren, 1999), this study demonstrated that formal training is not the panacea for learning and the transfer of learning.

Organizations and HRD practitioners would be well served to rethink their approach to managerial learning and proficiency. Our study suggested that managers learn mostly from informal learning, that proficiency is the product of informal learning, and that metacognitive knowledge and self-regulation skills moderate informal learning and the transfer process. In the 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 strategies, companies may save money, develop more proficient managers, and gain a competitive advantage.

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