The Effect of Mental Practice and Goal Setting as a Transfer of Training Intervention on Supervisors’ Self-efficacy and Communication Skills: An Exploratory Study

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Mental practice, where goal setting was either implicit or explicit, was investigated in a pulp and paper mill as a post-training intervention with regard to self-efficacy and the transfer of newly taught communication skills to the work environment. A 6-month follow-up study revealed that mental practice, compared to goal setting alone or control conditions, had a significant positive effect on supervisors’ self-efficacy and communication skills. These effects were mediated by the use of mental imagery in the mental practice condition. Supervisors who engaged in mental practice or goal setting showed improved communication behaviors compared to those who only set goals or were in the control condition. This study highlights the potential benefits of incorporating mental practice into training interventions to enhance transfer of learning to the workplace.
setting. Six months after the supervisors had been trained, a $2 \times 2$ ANCOVA showed that self-efficacy was significantly higher for the supervisors who engaged in either mental practice or in mental practice combined with goal setting than for those in the goal setting only or control conditions. Self-efficacy correlated significantly with goal commitment and communication skills on the job. Hierarchical regression analysis indicated that the supervisor's imagery skills moderated the effect of mental practice on self-efficacy. Both the supervisors in the mental practice and in the goal setting and mental practice conditions were observed by peers to have improved their communication behaviour on the job. No change in communication behaviour was observed on the part of supervisors who set goals but did not engage in mental practice or were assigned to the control group.

**INTRODUCTION**

Traditional approaches to bringing about transfer of training in organisational settings have been based primarily on findings in experimental psychology, namely, identical elements (Thorndike & Woodworth, 1901), general principles (McGehee & Thayer, 1961), and stimulus variability (Ellis, 1965). Baldwin and Ford (1988), Tannenbaum and Yukl (1992), and Latham and Seijts (1998) have argued that advances in understanding ways to increase transfer of training are likely to occur if attention is given to interventions that take place subsequent to training. Preliminary findings indicate that one such intervention is goal setting.

Goal setting (Locke & Latham, 1990) is a theory of employee motivation regarding task performance. The theory states that if the person has the requisite ability, a specific difficult goal not only influences an employee's subsequent behaviour through choice, effort, and persistence, it affects behaviour cognitively through the search for knowledge of ways to attain the goal. Wexley and Nemeroff (1975) were among the first to test the effectiveness of goal setting as a way to increase positive transfer of training. Employees who were assigned behavioural goals at the end of a two-day workshop on leadership and interpersonal skills exhibited greater transfer of the learned material on the job than did the participants in the control group. Similarly, Wexley and Baldwin (1986) found that goals, whether assigned or set participatively at the end of training, resulted in higher transfer of training of time management skills than no goal setting, or even giving people training in relapse prevention (Marx, 1982).

The discipline necessary for ongoing goal commitment can be problematic to the use of goal setting alone as a transfer of training intervention. An antidote is to complement goal setting with training in self-management that teaches people systematically to reward their efforts for goal attainment, and to self-administer sanctions for failure to do so. Empirical results indicate that goal setting that includes self-management techniques is an effective way to increase positive transfer of training (Gist, Bavetta,
Another potential limitation to the sole use of goal setting to facilitate transfer of training is that this motivational technique assumes that the person has mastered the skill necessary to exhibit on the job the knowledge that was disseminated in the training programme. Kanfer and Ackerman (1989) found that when learning has yet to take place, setting a specific outcome goal can have a deleterious effect on performance. A post-training intervention that may overcome this problem is mental practice. Mental practice is defined as the symbolic guided rehearsal of a task in the absence of any apparent physical movement (Richardson, 1967a). Typically mental practice is taught with a guided script that specifies: (a) the skills one wants to acquire, (b) step-by-step procedures for doing so, (c) instructions for people to visualise themselves implementing the script, and (d) ways to use all of one’s senses as opposed to only visualisation in imagining oneself performing the task (Wheatley, Maddox, & Anthony, 1989, p. 38). In short, people are taught to develop a mental plan on ways to attain their goal (Richardson, 1967b). The plan facilitates or augments training because it gives an individual opportunities mentally to rehearse what was taught during that training programme.

Research in clinical, counselling, and sport psychology have investigated the effect of mental practice as a cognitive training tool to increase performance (Murphy, 1990; Neck & Manz, 1992). Driskell, Copper, and Moran (1994) in a meta-analysis of 35 studies, found a significant average effect size \( \bar{d} = 0.53, P < 0.01 \) for this technique on both motor (e.g. dart throwing, basketball, speed skating) and cognitive tasks (e.g. puzzles, block tests). The more a task required mental operations (e.g. compare, organise, or categorise information; generate hypotheses), the greater the benefit of mental practice on subsequent performance \( r = 0.44, P < 0.01 \).

Research also indicates that the ability to visualise moderates the relationship between mental practice and performance (Doheny, 1993; Ryan & Simons, 1981). That is, mental practice is more effective for individuals with high rather than low visualisation ability regarding the vividness, clarity, and distinctiveness with which they can imagine a symbolic situation (Richardson, 1988).

The use of mental practice is consistent with social cognitive theory (Bandura, 1986, 1997) where forethought is central to the theory. Morin (1996) proposed that the effect of mental practice on task performance can be explained by the intervening effect of self-efficacy. Specifically, she argued that mental practice facilitates enactive mastery, vicarious experience, and self-guided verbal persuasion, three sources of information that Bandura (1986, 1997) identified as necessary for increasing self-efficacy. People can symbolically experience the mastery of a task during a mental practice exercise (Manz, 1986, 1992).
Purpose of Study

This field experiment was of necessity exploratory, because of the small population size of supervisors available to participate in the study, and because no empirical research has been reported to the authors’ knowledge on the effect of mental practice alone or combined with goal setting as a post-training strategy to facilitate transfer of learning in an organisational work setting. Self-efficacy was measured as a possible intervening variable, and visualisation ability was examined to see if it moderated the effect of mental practice on a trainee’s self-efficacy.

METHOD

Participants

The one-day training programme conducted prior to the transfer of training intervention involved all supervisors and process engineers employed in a pulp and paper mill in Ontario \( (n = 71) \). Fifty-one trainees volunteered for the transfer of training experiment; complete measures at the end of the transfer of training intervention\(^1\) were available from 41 participants. Their average age was 46 years; 93% were male. Given a moderate effect size, a 0.05 significance level, and the number of participants in each condition, the power to detect a significant effect was 0.45 (Cohen, 1988).

Procedure

Training. Prior to conducting this study, all supervisors had attended a one-day training programme on interpersonal communication skills. A needs analysis revealed that the participants had thorough knowledge of the requisite communication behaviours, but lacked confidence in applying them on the job. Hence, a one-day refresher training programme was conducted. A reaction measure was administered immediately following the refresher training.

The training consisted of lecture/group discussion, video presentations and role playing exercises. Classroom set-up, training content, and trainers were the same for all trainees. Upon completion of this one day of training, the participants’ reactions to the training were measured using eight five-point Likert-type questions. In addition, the participants were assessed on

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\(^1\) This time will be referred to as Time 2 whereas Time 1 will refer to the time after the training programme and before the transfer of training intervention.

their knowledge of interpersonal communication skills, and their self-efficacy beliefs regarding the application of these skills to the job. The learning test consisted of 15 multiple choice items. The measure of self-efficacy was developed consistent with the recommendations of Lee and Bobko (1994). The items assessed self-efficacy with respect to the 10 communication behaviours taught in the training programme (e.g. “When I engage in a business communication with others at the Mill, I am capable of ... —strictly focusing on the situation we are discussing;—praising publicly ideas and suggestions of others;—thanking people involved in the conversation/meeting for their participation and their time”).

The participants’ interpersonal communication skills exhibited on the job were assessed by two peers on a 10-item behavioural observation scale (BOS; Latham & Wexley, 1994). The behaviours were the 10 key learning points taught in training (e.g. “Shows appreciation for ideas and participation”; “Checks for understanding”). To increase the observers’ objectivity, three steps were followed consistent with Wherry and Bartlett’s (1982) recommendation for minimising observer bias. First, multiple raters were used. Second, the BOS consisted of observed behaviours (e.g. “Shows appreciation for ideas and participation”, “Says thank you”; “Gives credit for ideas of others”; “Gives compliments”). Third, the raters were trained in ways to increase their objectivity based on procedures developed by Latham, Wexley, and Pursell (1975).

Transfer of Training. Following the one-day refresher training programme, the participants were randomly assigned to one of four conditions: control group, goal setting only, mental practice only, and mental practice combined with goal setting. The supervisors in the control condition were instructed by the first author to do their best to apply the communication skills that they had been taught in the classroom to their job; the participants in the three treatment conditions attended four biweekly one-hour transfer of training sessions conducted by the first author.

The goal setting condition consisted of a 10-minute review of the 10 interpersonal behaviours that had been taught during the training programme as well as a discussion of the 10-item BOS; a 10-minute discussion of the rationale for goal setting; and a 30-minute goal commitment exercise where individuals publicly set a specific goal in terms of the score that they intended to attain on the BOS. Goal commitment was measured using an eight-item five-point Likert-type scale adapted from Hollenbeck, Klein, O’Leary, and Wright (1989).

Similarly, the mental practice condition consisted of a review of the 10 interpersonal behaviours, and a discussion of the BOS. In addition, 30 minutes were devoted to a mental practice exercise. The latter, delivered through an audiotape, taught people to visualise themselves engaging in
specific interpersonal communication behaviours with a specific individual (e.g. “You are sitting comfortably in your chair, you feel relaxed and calm. The person you are waiting for is now coming toward the room ... Slowly stand up and welcome that person with a smile. Now shake his or her hand and feel your fingers firmly but friendly squeezing the other person’s hand ... Now hear yourself saying the following words to the person ...”). At the end of the 30 minutes, the supervisors were urged to do their best to apply to their job what they had visualised.

The mental practice and goal setting condition was identical to the mental practice condition except that it included the setting of a specific difficult goal in terms of a score to be attained on the BOS, and then sharing that goal with the other participants in this condition.

A questionnaire assessing imagery skills was administered to the participants in all four conditions. The questionnaire contained 35 items adapted from the Betts Questionnaire upon Mental Imagery (Richardson, 1994). This questionnaire assesses visual, auditory, cutaneous, kinaesthetic, and olfactory sensory elements. In responding to each item on the questionnaire, the participants were asked to imagine a familiar scene and then rate the vividness of it on a seven-point Likert-type scale.

In the three subsequent transfer of training sessions that included goal setting, the participants discussed at least one situation where they had successfully applied the communication behaviours taught in the training class. This was followed by a goal commitment exercise where the participants stated publicly their intended steps to attain their goal. In the three subsequent sessions that included mental practice, 30 minutes were spent discussing successful applications of the communication behaviours, and 30 minutes were spent on mental practice.

One month after the fourth and final transfer of training session, reaction measures regarding the transfer of training interventions were collected, as were measures of self-efficacy regarding the application of the communication skills on the job. In addition, the supervisors, as noted previously, were evaluated anonymously by two peers of their choice on the extent to which they exhibited the communication behaviours on the job.

RESULTS

Manipulation Checks and Reliability

There was no significant difference among conditions with regard to the participants’ age ($F_{3,37} = 1.00, ns$) or years of service in the organisation ($F_{3,37} = 1.75, ns$). The coefficient alpha of the trainee reactions to the original one-day training programme on communication skills was 0.90. The data indicated that the trainees liked the programme ($M = 4.0$, $SD = 0.55$).
There was no significant difference in reactions among the transfer of training conditions ($F_{3,58} = 0.58, \text{ns})$.

There were also no significant differences among the training conditions on the learning test administered at the end of the one-day refresher training programme ($F_{3,37} = 2.56, \text{ns}$). The respective means and standard deviations for conditions 1–4 were 10.30 (2.31), 9.91 (2.02), 8.00 (1.49), and 10.10 (2.47).

There was no significant difference among conditions on the measure of self-efficacy immediately after the one-day refresher training ($F_{3,37} = 0.31, \text{ns}$). The coefficient alpha of this measure was 0.88 subsequent to the training. The respective means and standard deviations for conditions 1–4 were 125.50 (11.94), 123.82 (12.26), 127.00 (13.11), and 128.50 (9.03).

A two-tailed $t$-test ($t_{19} = 1.36, \text{ns}$) revealed no significant difference in goal difficulty between the participants in the goal setting condition ($M = 41.73; SD = 2.97$) and those in the mental practice plus goal setting ($M = 43.50, SD = 2.99$). The correlation between goal difficulty and performance at Time 2 was 0.54 ($P < 0.05$).

A two-tailed $t$-test ($t_{19} = 1.81, \text{ns}$) revealed no significant difference in goal commitment between the two respective conditions ($M = 31.27, SD = 4.71; M = 34.90, SD = 4.46$). The coefficient alpha of the goal commitment measure was 0.84. Two open-ended questions (e.g. “During the past two months did you set any goals regarding interpersonal communication?”) revealed that none of the participants in the non-goal setting conditions set goals.

Scores on the measure of visualisation ability ranged from 49 to 219 ($M = 93, SD = 34.36$). The coefficient alpha was 0.95. There were no significant differences among conditions prior to the training in mental practice ($F_{3,37} = 2.36, \text{ns}$).

Following the transfer of training interventions, participants in all four conditions were asked: “During the last two months, did you engage in some visualisation activity related to interpersonal communication? If yes, please comment on your visualisation experience”. None of the participants in the control or the goal setting only conditions reported engaging in this activity. In the two mental practice conditions, all participants reported an involvement in visualisation activity. The latter finding is supported by anecdotal data collected through the reaction measure to the transfer sessions (e.g. “After setting up a meeting date, I tried to visualise what I was going to say and how to say it so that all participants could be involved in the discussion”; “Visualising the different scenarios prior to a disciplinary meeting helped me to anticipate problems and to keep on track”; “Visualisation was helpful in preparing a meeting with the union on a discipline case”; “I visualised a conversation I wanted to initiate to resolve a conflict”).

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2 62 trainees out of 71 filled out the reaction measure.

The coefficient alphas of the BOS completed by peers prior and subsequent to the transfer of training intervention were 0.81 and 0.86, respectively. The correlation between performance at Time 1 and Time 2 was 0.53 (P < 0.01).

Transfer of Training

An ANCOVA with self-efficacy at Time 1 as the covariate and self-efficacy at Time 2 as the dependent variable revealed a main effect for mental practice (F_{1,36} = 6.07, P < 0.05). That is, the participants’ self-efficacy one month after the final transfer session in the two conditions involving mental practice was significantly higher than the self-efficacy of participants in the goal setting only condition or in the control group. The means and standard deviations are shown in Table 1.

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<thead>
<tr>
<th></th>
<th>No Goal setting</th>
<th>Goal setting</th>
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<tbody>
<tr>
<td></td>
<td>Time 1</td>
<td>Time 2</td>
</tr>
<tr>
<td>No mental practice</td>
<td>M = 125.50</td>
<td>SD = 11.94</td>
</tr>
<tr>
<td></td>
<td>M = 125.90</td>
<td>SD = 13.27</td>
</tr>
<tr>
<td>Mental practice</td>
<td>M = 127.00</td>
<td>SD = 13.11</td>
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<td></td>
<td>M = 132.40</td>
<td>SD = 8.8</td>
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To test whether the effect of training in mental practice on self-efficacy is moderated by a participant’s visualisation ability, a hierarchical multiple regression analysis was conducted (Baron & Kenny, 1986). The moderator was a continuous variable and the independent variable was a dichotomy (i.e. no mental practice = 0; mental practice = 1). The results revealed that mental practice explained a significant amount of the variance in self-efficacy at Time 2 (r² = 0.16, P < 0.05); ability to visualise explained a significant amount of incremental variance (Δr² = 0.05, P < 0.05); and the interaction term explained a significant amount of additional variance in self-efficacy at Time 2 (Δr² = 0.13, P < 0.01). In short, imagery skill moderated the effect of mental practice on self-efficacy beliefs.

The correlations between self-efficacy and goal commitment were significant at both Time 1 (r = 0.50, P < 0.05) and Time 2 (r = 0.75, P < 0.01). At Time 2, the end of the transfer of training intervention, the correlations between self-efficacy of the participants who engaged in either mental
practice alone or mental practice and goal setting with communication behaviour on the job were 0.53 ($P<0.05$) and 0.47 ($P<0.05$), respectively.

However, a $2 \times 2$ ANCOVA, with peer observations of communication behaviour at Time 2 as the dependant variable, and communication at Time 1 as the covariate, revealed no significant main effects for goal setting or mental practice ($F_{1.36} = 0.99$, $P = 0.37$, ns, $F_{1.36} = 0.97$, $P = 0.33$, ns). The means and standard deviations are shown in Table 2. The interaction effect was also not significant ($F_{1.36} = 0.30$, $P = 0.59$, ns).

Because of the exploratory nature of this study, and the lack of statistical power due to the small sample size, paired two-tailed $t$-tests were conducted to see if changes in behaviour were observed within conditions. The results indicated that the peers of the supervisors in the mental practice only condition observed a significant positive change in communication behaviour between Time 1 and Time 2 ($t_9 = 3.11$, $P<0.05$; $d = 0.62$). Moreover, peers also observed a significant positive change in communication behaviour of the participants who engaged in mental practice combined with goal setting ($t_9 = 3.67$, $P<0.01$; $d = 0.92$). No significant behavioural changes from Time 1 to Time 2 were observed on the part of the participants in the goal setting only condition ($t_{10} = 1.39$, $P = 0.19$, ns) or on the part of the participants in the control group ($t_9 = 1.40$, $P = 0.20$, ns).

### DISCUSSION

Among the most consistent findings from recent research on transfer of training has been the central role of a trainee’s self-efficacy for applying training content to the job (Mathieu, Tannenbaum, & Salas, 1992; Mathieu, Martineau, & Tannenbaum, 1993; Saks, 1995). Thus the theoretical and practical significance of this study is at least threefold. First, this study suggests that mental practice is an effective cognitive strategy for transferring self-efficacy regarding what is taught in the classroom to the job. Self-efficacy correlated positively with the trainee’s behaviour on the job. As

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**TABLE 2**

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<th>No Goal setting</th>
<th>Goal setting</th>
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<tbody>
<tr>
<td></td>
<td>Time 1</td>
<td>Time 2</td>
</tr>
<tr>
<td>No mental practice</td>
<td>40.95 (3.09)</td>
<td>41.85 (3.46)</td>
</tr>
<tr>
<td>Mental practice</td>
<td>38.75 (3.47)</td>
<td>41.00 (3.76)</td>
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argued previously, mental practice may affect one’s self-efficacy by acting as symbolic enactive mastery, self-modelling, and self-guided verbal persuasion, three main determinants of self-efficacy beliefs (Bandura, 1986, 1997).

Second, the results revealed that the participants’ imagery skills moderate the effect of mental practice on self-efficacy. This finding is consistent with the argument that the effectiveness of mental practice is dependent upon the individuals’ ability fully to experience the situation elaborated through training in mental practice (Doheny, 1993; Ryan & Simons, 1981).

Third, goal setting by itself is not always an effective transfer of training intervention. This contradicts findings from earlier studies (e.g. Wexley & Baldwin, 1986; Wexley & Nemeroff, 1975). This contradiction may reflect the fact that the one-day refresher training was only sufficient for giving people the knowledge, but not the confidence necessary, to exhibit the target behaviours on the job. This interpretation of the data is consistent with the fact that self-efficacy increased as a result of mental practice alone. Through visualisation, additional practice of the skills, or enactive mastery of the skills taught in the classroom could occur symbolically in the mental practice condition. Goal setting was implicit in this condition in that the participants visualised themselves engaging in the behaviours specified on the BOS. Thus this study suggests that mental practice is an effective transfer of training technique not only because it increases the amount of practice of the skills that are taught during training, but it implicitly includes goal setting which in turn increases self-efficacy with regard to applying training content on the job. The correlations between self-efficacy and goal commitment were moderately high at Time 1 and very high at Time 2.

The present study also provides supportive evidence for findings obtained by Kanfer, Ackerman, Murtha, Dugdale, and Nelson (1994). In that study, goal setting was effective in enhancing performance among trainees in the spaced condition, where there was sufficient time for cognitive rehearsal, but not for those in the massed practice condition where the opportunity for cognitive rehearsal was severely limited. Over 60 years ago, Woodworth (1938) argued that spaced practice is more effective than massed practice because covert rehearsal can occur during rest intervals.

A limitation of this study was the lack of statistical power due to the small sample size. Thus the results of this study regarding the transfer of communication skills to the job setting, based on paired t-tests, must be viewed at best as tentative. Despite this limitation, we believe that this is a provocative study in that it suggests that a psychological mechanism that clinical and sport psychologists have long used to support and strengthen commitment and confidence in behaviour change programmes is also applicable for facilitating transfer of training in an industrial-organisational setting.

Future research should examine the effect of mental practice with learning goals. Winters and Latham (1996) found that on tasks where the person has
not acquired the requisite knowledge or skills to perform them, learning rather than outcome goals should be set in order to obtain a significant increase in performance. This is because learning goals focus attention on the discovery of strategies to attain an outcome. Mental practice may be an optimal way to facilitate the discovery of strategies for attaining a learning goal, and hence mastering the task.

Research should also compare the relative effectiveness of mental practice versus self-talk, and, in addition, examine the effect of combining the two into one transfer of training treatment package. Training in functional self-talk refers to an internal dialogue to increase self-efficacy in performing a task. Millman and Latham (in press) found that this training increased the self-efficacy of displaced managers regarding reemployment. Moreover, within nine months of the training, the number of people who were reemployed was significantly higher than that in the control group. The interrelationships between mental practice and self-talk as transfer of training strategies need to be explored.

Qualitative data should be collected systematically on what the participants experience during mental practice sessions. Anecdotal comments suggest that the participants’ symbolic enactment mastery, self-persuasion, and self-modelling were high.

Finally, the control condition should arguably include follow-up sessions in which participants attend meetings where no specific intervention is introduced. This would allow specific elements of post-training interventions to be distinguished from the effect of sustained attention alone.

REFERENCES


