What predicts skill transfer? An exploratory study of goal orientation, training self-efficacy and organizational supports

Dan S. Chiaburu
Sophia V. Marinova

Results from a study examining the predictors of skill transfer from an instructional to a work environment are presented. Prior research indicates that skill transfer is a function of both individual and contextual factors. A total of 186 employees from a work organization were surveyed on individual dimensions (goal orientation, training self-efficacy) and contextual factors (supervisor and peer support). Pre-training motivation was proposed as proximal training outcome and further connected to the distal outcome, skill transfer. Analyses with structural equation modeling using EQS indicate that individual dimensions, such as mastery-approach goal orientation and training self-efficacy, are related to pre-training motivation. Also, contextual factors, such as peer support, predicted both pre-training motivation and skill transfer, while supervisor support was unrelated to either pre-training motivation or skill transfer. Pre-training motivation, in turn, was related to skill transfer. Implications for theory and practice are discussed.
Introduction

Rapid changes in the external environment of organizational training systems (Rothwell & Kolb, 1999; Thayer, 1997) bring pressures on work organizations to select optimal performance improvement interventions and to measure their impact. Training is one way to increase performance. We define training for the purpose of the present study as ‘a planned intervention that is designed to enhance the determinants of individual job performance’ (Campbell & Kuncel, 2001, p. 278). As training is recognized as a main solution for performance improvement (Dean et al., 1996) and organizations allocate significant human and financial resources to training (Van Buren & Erskine, 2002), there is a continuous need to explore the determinants of successful skill transfer (e.g. Holton et al., 2000; Holton & Baldwin, 2003a). Factors that can contribute to skill transfer include individual characteristics, work environment and training design (Baldwin & Ford, 1988; Lim & Johnson, 2002; Noe, 1986; Olsen, 1998). Design-related relationships were investigated in theoretical (e.g. Arthur et al., 2003), prescriptive (Cannon-Bowers et al., 1998) and empirical studies (Gist, 1997; Kraiger et al., 1995; Warr & Bunce, 1995). Consequently, the present study explores non-design factors, such as individual and contextual determinants of training motivation and skill transfer.

Both practitioners and researchers recognize the importance of skill transfer. In their review of the science of training in the last decade, Salas and Cannon-Bowers (2001) acknowledge the advances and call for more research that would ‘continue to determine which factors affect transfer so that we can maximize it’ (p. 489). Practitioners also call for a systematic management of skill transfer (Broad, 2003). Indeed, both meta-analytical (Alliger & Janak, 1989; Alliger et al., 1997) and conceptual work (Holton, 1996) provided evidence of the limitations of Kirkpatrick’s (1998) model, focused on the well-known ‘four levels’ (reactions to the program, learning, behavior change, and results). Such evidence prompted researchers to offer integrative models that include factors such as motivation (Colquitt et al., 2000) and to propose more comprehensive training outcomes (Holton, 1996). Empirical work also explored the relationship between individual factors (e.g. Gist et al., 1991; Phillips & Gully, 1997) or organizational context (Rouiller & Goldstein, 1993; Tracey et al., 1995) and skill transfer. Some of these prior studies attempted to use both individual and contextual factors as predictors of training effectiveness (Facteau et al., 1995; Tracey et al., 2001).

Responding to a need to examine both individual and organizational contextual factors related to training outcomes (Baldwin & Ford, 1988; Colquitt et al., 2000; Quinones, 1997), we explore contextual (i.e. supervisor support and peer support) and individual (goal orientation and self-efficacy) predictors of proximal (pre-training motivation) and distal (skill transfer) training outcomes. The model tested in the study is presented in Figure 1.

The present study also aims at addressing several limitations of prior research. First, although studies relate organizational supports (supervisor and peer support) to training outcomes, these dimensions need to be incorporated in models that are better specified and include both situational factors, such as pre-training motivation, and individual predictors such as goal orientation and self-efficacy. In addition, prior research remains ambiguous on the influence of organizational supports on training outcomes. For example, Facteau and colleagues (1995) confirmed that while supervisor support is related to pre-training motivation, it does not predict skill transfer. In the same study, peer support was unrelated to pre-training motivation, while contributing significantly to skill transfer. As support relationships yielded mixed results, they need to be further examined.

Second, although goal orientation has been examined in relation to training outcomes (e.g. Kozlowski et al., 2001; Phillips & Gully, 1997), prior research is limited to either the dual typology that conceptualizes goals as mastery- and performance-oriented (Button et al., 1996), or to the mastery, performance-approach and performance-avoidance triad (VandeWalle, 1997). However, more recently, researchers proposed a $2 \times 2$ achievement goal framework, with unique antecedents and consequences (Elliot
Such frameworks are especially important in relationship to pre-training motivation, given that prior research has confirmed the existence of differential effects of goal orientation on various training outcomes. Therefore, we use this more complex conceptualization to advance prior research.

Third, while self-efficacy for specific skills is positioned as a predictor of pre-training motivation and transfer in theory building (e.g. Colquitt et al., 2000) and empirical studies (e.g. Phillips & Gully, 1997), general self-efficacy is rarely examined in relation to training motivation. This remains an important question, as trainees with high general self-efficacy might be more inclined to obtain higher training outcomes than their counterparts with lower self-efficacy. Considering these research gaps, we examine the influence of contextual factors, such as supervisor support and peer support, and individual predictors, such as goal orientation and training self-efficacy, on pre-training motivation and skill transfer. Support for the model is provided next.

Predicting skill transfer: pre-training motivation

One of the possible mechanisms through which predictors operate on skill transfer is pre-training motivation. Noe and Schmitt (1986) proposed a relationship between pre-training motivation and training outcomes, and subsequent empirical studies provided support for this relationship (Facteau et al., 1995; Mathieu et al., 1992; Tannenbaum et al., 1991; Tracey et al., 2001). As a result of the accumulated evidence, Colquitt et al. (2000) position motivation as a central component of their meta-analysis. Since this relationship is supported in prior studies, we are primarily interested in providing a replication; the main focus of the study is on exploring the antecedents of both skill transfer and pre-training motivation. While prior studies have examined

Figure 1: Proposed model
different antecedents of pre-training motivation, we focus here on training self-efficacy, goal orientation and organizational supports.

**Predicting pre-training motivation: individual and contextual factors**

*Training self-efficacy*

Bandura defines self-efficacy as ‘self-belief in one’s capabilities to exercise control over events to accomplish desired goals’ (Wood & Bandura, 1989, p. 364). Research indicates that individuals higher in self-efficacy have strong beliefs in their task-related capabilities and set more challenging goals than individuals with lower self-efficacy (Bandura, 1986). Such individuals might also have higher levels of pre-training motivation. Indeed, the meta-analysis of Colquitt et al. (2000) confirms that self-efficacy predicts motivation to learn. This is consistent with prior studies connecting self-efficacy to pre-training motivation (e.g. Quiñones, 1995) and to other training outcomes (Gist et al., 1991; Phillips & Gully, 1997). Such relationships were also confirmed in other national settings; for example, Lim and Chan (2003) linked self-efficacy to motivation for skills upgrading. Consequently, we expect a positive relationship between self-efficacy and pre-training motivation.

*Goal orientation*

Goal orientation refers to the goals pursued by individuals in achievement situations. Initially, researchers proposed two types of goals, focused either on performance or on mastery/learning (Button et al., 1996; Dweck & Leggett, 1988). Specifically, individuals with high learning goal orientations focus on increasing their learning and/or task competence, seeking challenges, and persisting in the case of failure (Dweck & Legget, 1988). In contrast, individuals with high performance goal orientation are interested in demonstrating task competence through gaining positive and avoiding negative judgments of competence. Such performance-oriented individuals tend to avoid challenges, decrease their effort and persistence following failure, and fear negative evaluation by others (Button et al., 1996). Given these orientations, individuals with high learning goal orientation are likely to exhibit higher levels of pre-training motivation. Any mistakes or setbacks would be construed as learning opportunities that would motivate them. It is possible that while such mastery-oriented individuals will construe learning and transfer as another opportunity for learning, ‘performance oriented individuals would look for cues as to whether he/she should attempt to learn and transfer trained skills’ (Ford & Weissbein, 1997, p. 38).

While prior studies conceptualized goal orientation as mastery- or performance-oriented only, a more recent conceptualization classifies goals according to their definition and valence (Elliott & McGregor, 2001). Accordingly, individuals define goals either in *intrapersonal* terms, aiming at task mastery, or in *normative* terms, focusing on task performance. In terms of *valence*, individuals exhibit either a *positive* (approaching success) or *negative* (avoiding failure) approach. Although researchers examined the relationship between goal orientation and training outcomes (e.g. Fisher & Ford, 1998; Kozlowski et al., 2001; Phillips & Gully, 1997), these authors used either the two dimensions of Button et al. (1996; performance vs. mastery), or the three dimensions of VandeWalle (1997; mastery, performance-approach and performance-avoidance). Prior research linked mastery goal orientation to greater effort and more complex learning strategies in comparison to performance goal orientation, associated with lower levels of skill maintenance and less task-effort (Fisher & Ford, 1998). More specifically, mastery-approach goal orientation was related to deep processing and mastery-approach goals (Elliott & McGregor, 2001). It is also clear that individuals with a mastery orientation are more motivated to learn and learn more than individuals that are more performance-oriented (Colquitt & Simmering, 1998; Phillips & Gully, 1997). In light of these studies, we propose that a mastery approach will be positively associated with pre-training motivation, while the other dimensions either negatively related or unrelated. Given that prior studies offer little guidance in predicting pre-training motivation based on the four goal orientation dimensions, we do
not engage in more precise hypotheses development and remain at an exploratory level.

Organizational support
Supports from the organization and the training context emerged as important predictors of transfer since the early studies of Noe and Schmitt (1986), although these authors collapsed the scales to form a single variable, labeled organizational favorability. Other studies also used a collapsed scale, defined as work environment (Tracey et al., 2001). Because prior studies demonstrate differential effects on training outcomes as a function of the support source (supervisors or peers; e.g. Facteau et al., 1995), we conceptualize support according to its source. Although prior research confirmed the importance of supervisor support for transfer of training (Awoniyi et al., 2002; Gumuseli & Ergin, 2002) and the effect of supervisor support on training motivation (e.g., Brinkerhoff & Montesino, 1995; Clark et al., 1993; Cohen, 1990; Facteau et al., 1995; Grégoire et al., 1998) other studies did not find any relationship between supervisor support and training effectiveness (Russell et al., 1985; van der Klink et al., 2001). In addition, in some studies, peer support was related to skill transfer, but not related to pre-training motivation (e.g. Facteau et al., 1995), while in others peer support predicted motivation to transfer (e.g. Ruona et al., 2002). As the theoretical underpinnings of support remain unclear, these relationships need further examination. Consequently, we propose positive relationships between supervisor support and peer support and both pre-training motivation and skill transfer.

Research questions
In summary, the study investigates predictors of skill transfer and pre-training motivation. Pre-training motivation has a central position in the model, based on studies that propose it as a link between individual and contextual antecedents and training outcomes (e.g. Colquitt et al., 2000; Facteau et al., 1995; Tracey et al., 2001). Thus, our research questions are related to (a) the relationship between pre-training motivation and skill transfer and (b) the influence of individual and contextual factors on pre-training motivation. Also, in a more exploratory fashion, (c) supervisor support and peer support are connected to both pre-training motivation and skill transfer. Overall, these results should provide useful information for both theory and practice. From a theoretical perspective, the study might complement prior empirical studies (Clarke, 2002; Facteau et al., 1995; Tracey et al., 2001) forwarded as support for models proposed by Baldwin and Ford (1988) and Noe (1986). From a practical perspective, the study can offer insights for ‘making transfer happen’ (Holton & Baldwin, 2003b) in applied settings and provide an example of how an assessment designed for a specific organization might create knowledge that is particular to the focal setting.

Method
Sample and procedure
This study was conducted in a work organization in the United States. Employees who attended a one-day corporate information program in the focal organization were asked to participate in the study. These employees were part of a group that attended at least one training course in the last three months. After being informed of the purpose of the study and assured of the anonymity and confidentiality of their responses, the employees completed a questionnaire. Completed surveys were returned to the researchers.

To diminish single-source bias, we used procedural remedies recommended by Podsakoff et al. (2003, p. 888), such as separation of measures and wording of the criterion variable. For example, the items of the criterion variable were mixed with the other items, as opposed to items representing the predictors, which were clearly separated. In addition, the first part of the questionnaire (including the criterion
variable) was completed at the beginning of the information session; the rest of the questions were answered at the end of the program. Research indicates that such techniques reduce consistency motifs and demand characteristics (Podsakoff et al., 2003). A total of 192 questionnaires were collected; of them, 186 contained usable data.

**Measures**

We used previously published scales to collect data relevant for the study. Unless otherwise indicated, all measures were assessed using a five-point Likert-type scale (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; and 5 = strongly agree).

*Training self-efficacy* was measured using the nine-item scale from Noe & Wilk (1993); the scale was validated and used in other studies examining the impact of self-efficacy on training motivation (e.g. Carlson et al., 2000). An item reads, ‘When I take training courses in unfamiliar areas, I expect to be able to do well at them.’ Cronbach’s alpha for the scale in this study was 0.78.

*Goal orientation* was measured using the $2 \times 2$ conceptualization of Elliott & McGregor (2001) including mastery-approach, mastery-avoidance, performance-approach and performance-avoidance (three items each). Sample items for the constructs, in order, read, ‘When attending training at [organization] . . . ’ ‘I want to completely master the material presented in class,’ ‘I am worried that I may not learn all that I possibly can in class,’ ‘It is important for me to do well compared to others in class,’ and ‘I just want to avoid performing poorly in class.’ Cronbach’s alphas for these scales in our study were 0.83, 0.85, 0.86, and 0.78, respectively.

*Supervisor support* was measured using a five-item scale from Yarnall (1998). A sample item is, ‘My supervisor views employee development as an important aspect of his job.’ We added two other items, relevant to the present organizational setting: ‘My supervisor provides me with the time I need to practice the skills learned in training,’ and ‘My supervisor provides me with constant reminders on how to apply the acquired skills.’ Cronbach’s alpha for the scale in this study was 0.95.

*Peer support* was measured using two items from the scale provided by Noe and Schmitt (1986). An item reads, ‘My peers care about my applying new knowledge on the job’. Cronbach’s alpha for the scale in this study was 0.67.

*Pre-training motivation* was measured using a ten-item scale from Noe and Schmitt (1986). An item reads, ‘I try to learn as much as I can from training programs.’ Cronbach’s alpha for the scale in this study was 0.82.

*Skill transfer* was measured using six items from several different scales, including Facteau et al. (1995) and Xiao (1996). An example item is, ‘I can accomplish the job tasks better by using new knowledge acquired from training courses.’ Cronbach’s alpha for the scale in this study was 0.83.

**Analytical procedure**

We used structural equation modeling to test the relationships between the constructs. One of the major advantages of this technique is that it models the relationships at the item level, thus explicitly accounting for measurement error. As recommended by Anderson and Gerbing (1988), we analyzed separately the measurement and structural models. First, we used a confirmatory factor analysis (CFA) with EQS (Bentler, 2002) to determine if the items used in the study load on their *a priori* factors. We used raw data as input and analyzed the covariance matrix using maximum likelihood estimation; the scale items were the input, and the indices provided by EQS were used to assess model fit. Following the suggestions of Hu and Bentler (1998, 1999) for reporting fit, we provide information on the standardized root-mean-square residual (SRMR) and several other indices, such as the root-mean-square error of approximation (RMSEA; Browne & Cudeck, 1993), the non-normed fit index (NNFI; Tucker & Lewis, 1973) and the comparative fit index (CFI; Bentler, 1990). We used a 0.90 criterion for the CFI and NNFI, as recommended by Medsker et al. (1994); similarly, the cutoff

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scores were 0.08 for the SRMR and 0.06 for the RMSEA, as recommended by Hu and Bentler (1998, 1999). In addition, changes in chi-square tests were used to evaluate the best model fit to the data. After evaluating the measurement model using CFA, we used structural equation modeling (EQS, Bentler, 2002) to test the relationships among the constructs.

**Results**

**Confirmatory factor analysis**

Before considering the proposed relationships, we examined the accuracy of the measurement model. Table 1 presents the goodness of fit indices for the a priori measurement model. The results indicated that model fit could be improved, and a more detailed examination revealed how to achieve such improvements. Similar to modifications used in other studies on training outcomes (e.g. Facteau et al., 1995), we deleted reverse-scored items because of the failure to load on their a priori factors. We also dropped several other items that did not load on their corresponding factor. Consequently, model fit improved: all the estimated parameters (i.e., the scale items) loaded on their constructs (factors); loadings were in their majority higher than (0.70) and statistically significant ($p < 0.05$). In addition, the goodness-of-fit indices presented in Table 1 indicate that the model fits the data well (e.g. CFI = 0.905; SRMR = 0.054; RMSEA = 0.060). This measurement model was used to test the relationships proposed in the structural model. Table 2 presents information on the variables in the study, their internal reliability coefficient and the zero-order correlations with the criterion variable (skill transfer). With one exception, reliabilities of the scales used in the study are above 0.70, as recommended by Nunnally (1978).

<table>
<thead>
<tr>
<th>Models</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>NNFI</th>
<th>SRMR</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>A priori measurement model</td>
<td>2441.845</td>
<td>1044</td>
<td>0.826</td>
<td>0.812</td>
<td>0.089</td>
<td>0.069</td>
</tr>
<tr>
<td>Revised measurement model</td>
<td>1293.862</td>
<td>629</td>
<td>0.905</td>
<td>0.894</td>
<td>0.054</td>
<td>0.060</td>
</tr>
<tr>
<td>Structural model</td>
<td>1274.530</td>
<td>607</td>
<td>0.901</td>
<td>0.892</td>
<td>0.080</td>
<td>0.061</td>
</tr>
</tbody>
</table>

All $\chi^2$ values are significant at $p < 0.01$. CFI = comparative fit index; NNFI = non-normed fit index; SRMR = standardized root-mean-square residual; RMSEA = root-mean-square error of approximation.

**Table 2: Pearson correlation coefficients for bivariate relationships between skill transfer and independent variables and Cronbach alphas for the measurement scales**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>$\alpha$</th>
<th>Skill transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery-approach goal orientation</td>
<td>186</td>
<td>0.83</td>
<td>0.32**</td>
</tr>
<tr>
<td>Mastery-avoidance goal orientation</td>
<td>186</td>
<td>0.85</td>
<td>0.17**</td>
</tr>
<tr>
<td>Performance-approach goal orientation</td>
<td>186</td>
<td>0.86</td>
<td>0.30**</td>
</tr>
<tr>
<td>Performance-avoidance goal orientation</td>
<td>186</td>
<td>0.78</td>
<td>0.25**</td>
</tr>
<tr>
<td>Supervisor support</td>
<td>186</td>
<td>0.95</td>
<td>0.18**</td>
</tr>
<tr>
<td>Peer support</td>
<td>186</td>
<td>0.67</td>
<td>0.48**</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>186</td>
<td>0.78</td>
<td>0.19**</td>
</tr>
<tr>
<td>Pre-training motivation</td>
<td>186</td>
<td>0.82</td>
<td>0.30**</td>
</tr>
<tr>
<td>Skill transfer</td>
<td>186</td>
<td>0.82</td>
<td>–</td>
</tr>
</tbody>
</table>

*Note: ** $p < 0.01.$*
The second stage of analysis involved estimating the proposed relationships. The results of the analyses are presented in Figure 2, with the relationships represented as standard path coefficients. The following constructs were allowed to co-vary: (a) the goal orientation respective dimensions, (b) self-efficacy with goal orientation, and (c) peer and supervisor support. Results indicate that pre-training motivation and peer support are related to skill transfer. In addition, pre-training motivation is predicted (in order of importance) by mastery-approach goal orientation, peer support and self-efficacy. Self-efficacy is not directly related to skill transfer, while peer support influences mainly skill transfer rather than pre-training motivation. Surprisingly, supervisor support was unrelated to both proximal or distal training outcomes. A discussion of the findings is presented next.

Discussion

The main objective of this study was to test a model including individual and contextual predictors of pre-training motivation and skill transfer. In addition to the potential theoretical contribution, the results provide practical knowledge; if validated, such models can be used in a different applied setting. Overall, the model proposed in Figure 1 was supported. One of the study findings is that skill transfer is predicted by the proximal training outcome, pre-training motivation. Thus, we replicate prior findings (e.g. Facteau et al.,...
and provide support for the proposition that trainees entering training programs with higher levels of motivation report higher levels of skill transfer. In turn, pre-training motivation was predicted mainly by individual factors, such as mastery-approach goal orientation and training self-efficacy and, to a lesser extent, by contextual factors such as peer support. Specifically, as expected, mastery-approach goal orientation predicted pre-training motivation, while all the other goal orientation sub-dimensions were unrelated. This finding is aligned with research in educational settings; specifically, studies indicate a positive relationship between mastery-approach goal orientation and both (a) deep processing and (b) mastery-approach goal setting (Elliott & McGregor, 2001), the latter bearing similarities with training motivation. The finding provides additional information on the relationship between the fourfold conceptualization of goal orientation and pre-training motivation. The present data supports the fact that both the goal type (i.e. mastery) and goal valence (approach) are important in predicting pre-training motivation. Thus, trainees who define training-related goals in intrapersonal (rather than normative) terms and who use positive (approaching success rather than avoiding failure) strategies in the instructional environment are more likely to exhibit increased levels of pre-training motivation, and to report higher levels of skill transfer. Conversely, a combination of normative goals and avoidance strategies has no impact on pre-training motivation. Future research might explicate these relationships and determine if the absence of a relationship can be attributed to the separate goal orientation components (normative goals or avoidance strategies), or to their joint influence.

Another individual-level predictor of pre-training motivation was training self-efficacy. The results of the present field study support the position of pre-training motivation as a mediator between training self-efficacy and skill transfer. Thus, trainees with higher levels of self-efficacy were more motivated to train than trainees with lower confidence, and as a result of their higher motivation, they reported higher levels of skill transfer.

From a contextual perspective, peer support was related to both pre-training motivation and skill transfer, with a stronger relationship with the latter. Somewhat surprisingly, supervisor support was not related to either motivation to learn or to skill transfer. A possible explanation for this pattern is that employees in the focal organization depend less on their supervisors for training outcomes than on organizational-level policies and procedures and on team-level support from peers. Indeed, other studies also found supervisor support unrelated to skill transfer (Facteau et al., 1995; Russell et al., 1985; Van der Klink et al., 2001). It is interesting to note that our results are very similar to the relationships between supervisor support and pre-training motivation and skill transfer reported by Facteau and colleagues, who studied a public organization. Along the same lines, Holton et al. (2003) cite a case study whereby peer support was a more powerful predictor of learning transfer than supervisor support (p. 460). Another result of the same study is that supervisor support has low levels across training types (p. 479).

Despite these convergent results, one cannot rule out the possibility that the relationship of supervisor support with skill transfer is a statistical artifact rather than a substantive finding. Specifically, it is possible that supervisor support is a suppressor variable. Loosely defined, suppression occurs when a variable’s regression weight is different in nature than its simple correlation with the dependent variable (Bobko, 2001, p. 253). Indeed, an examination of the bi-variate correlations between supervisor support and pre-training motivation ($r = 0.14$, $p < 0.05$) and transfer of skills ($r = 0.25$, $p < 0.01$) reveals that they are positive. Although the results in the structural model are not statistically significant, they indicate a positive relationship between supervisor support and pre-training motivation ($\beta = 0.04$, n.s.) and a negative one between supervisor support and skill transfer ($\beta = -0.10$, n.s.). Such results indicate that it is important to disaggregate the more general construct of work environment, or organizational support, into its components (supervisor and peer support). Future research should examine if these relationships hold in other settings. The present study also has potential theoretical and practical implications, discussed after the study limitations.
Limitations

This study is not without limitations. First, trainees in this study represent only a subsample of all the trainees attending training programs during one business cycle in the focal organization. While these trainees represent a variety of line, administrative and supervisory positions and a variety of functional areas, future studies should replicate these findings on a representative sample. Second, the study uses self-reports for all the variables under investigation. However, as argued by other authors using the same source to test similar relationships (e.g. Facteau et al., 1995), there is no evidence indicating that trainees cannot accurately report skill transfer. Third, the generalizability of the results might be limited since the dataset is specific to one work organization. Thus, the relationships have to be tested in other organizations that use different training programs and other trainees.

Theoretical and practical study contributions

Despite the above limitations, this study extends prior research in several ways. First, it uses a complete conceptualization of goal orientation to predict training outcomes. Second, training self-efficacy is tested in relationship to pre-training motivation; the data also provides support for pre-training motivation as mediator of the relationship between self-efficacy and skill transfer. Finally, although the study does not propose a definitive response to the influence of organizational supports, it adds to the existing knowledge base (Clarke, 2002; Facteau et al., 1995; Gumuseli & Ergin, 2002; Tracey et al., 2001; Van der Klink et al., 2001) and might stimulate further research.

The study also has important practical implications. Provided that these findings generalize to other settings, practitioners and managers can use them to inform their decisions on interventions designed to enhance skill transfer. Reviewers of the transfer literature mention that some of the problems are related to the absence of actionable knowledge derived from empirical studies (Holton & Baldwin, 2003b), coupled with the presence of generalizations that might be inappropriate for other settings (Holton et al., 2003). The present findings offer both actionable knowledge and an illustration of how a training effectiveness framework can be used and validated.

As the present study outlines predictors of training outcomes such as training self-efficacy, mastery-approach goal orientation and peer support, practitioners can use a number interventions to enhance these components. For example, knowing that training self-efficacy is related to pre-training motivation can lead to the utilization of several strategies. While selection of trainees based on training self-efficacy levels might be difficult to implement in some settings, the alternative is to design interventions aimed at increasing training self-efficacy. Indeed, research indicates that some of the self-efficacy antecedents are verbal persuasion, logical verification, behavior modeling and past experience (Bandura, 1986). Thus, both practitioners designing interventions for training outcome optimization and trainers operating in the instructional environment have a number of options to increase self-efficacy. Another option is related to managing attributions for unsuccessful outcomes, as suggested by Steiner et al. (1991). Specifically, guiding trainees to attribute their failure to unstable causes might enhance (or at least not decrease) trainee self-efficacy. Alternatively, selection based on self-efficacy levels might be useful when training is done in multiple waves. Employees with higher levels of self-efficacy can be trained in the first wave and serve as models for those in subsequent waves, given that those who succeeded at the same task can enhance the self-efficacy of their peers.

As trainees setting mastery-approach goals have higher levels of pre-training motivation for the present sample, it is possible to create instructional modules that aim at goal orientation assessment and modification. Although goal orientation is frequently presented as stable disposition, research indicates that it is amenable to modification (Kozlowski et al., 2001; Stevens & Gist, 1997); furthermore, changes toward a mastery goal orientation can impact training outcomes (Cannon-Bowers et al., 1998). Therefore, we propose that goal orientation might be construed as a relatively stable individual
difference that can be influenced by situational characteristics (Button et al., 1996; Chen et al., 2000; Dweck, 1989; Elliot, 1999; Farr et al., 1993; Harackiewicz et al., 1997).

Specifically, when few situational cues are present, individuals will tend to use goals determined by their dispositions (Button et al., 1996). However, several strategies can be used to influence goal orientation. For example, it is possible to provide situational cues related to the reward structure and to social comparison information; such cues can be designed or emphasized in order to orient trainees toward specific types of goals (Dweck, 1989; Farr et al., 1993). For instance, contextual factors such as reward structures might be used to de-emphasize aspects of the environment that are likely to detract trainees from state mastery-approach goal orientation. Rewards based on effort rather than results may reduce the performance pressure, thereby increasing the level of individual mastery-approach orientation. Closer to the instructional environment, it is possible to manage trainees’ perception of ability; for example, research indicates that entity and incremental theories of ability are differentially related to trainees’ goal orientation (Martocchio, 1994). In a related course of action, it is also possible to utilize self-management interventions; as self-management provides explicit instruction in metacognitive activities related to self-regulation, it may also elicit mastery goal orientation (Stevens & Gist, 1997). Such interventions on goal orientation can impact proximal and distal training outcomes. Consequently, interventions aimed at inducing a mastery-approach before or in the initial phases of a training session may be helpful in managing goal orientation (Janssen & Van Yperen, 2004; VandeWalle et al., 1999). This information equips practitioners with a broader set of options for increasing training effectiveness.

As organizational supports are important for skill transfer, interventions aimed at changing related employee perceptions can be devised. This can be done, for example, through formal processes such as policies and directives. Peer support can be enhanced through the creation of knowledge management and performance appraisal systems that encourage and reward knowledge sharing and reciprocal support.

In summary, the results of the current study highlight the importance of including both individual and contextual factors when exploring training effectiveness antecedents. The results also show the utility of disentangling organizational supports according to their sources, the usefulness of training self-efficacy as a predictor of training outcomes and, most importantly, the positive relationship between mastery-approach goal orientation and pre-training motivation. As our model was tested on a sample including both line and supervisory positions from different functional areas and for all the training courses across the curriculum of the focal organization, it is plausible that these results are generalizable. Future research should expand this nomological net, and include constructs that were not examined.

References
Bentler, P. M. (2002), EQS, a structural equation program, version 6.0. Multivariate Software Inc.


Dean, P. J., Dean, M. R. and Rebalsky, R. M. (1996), ‘Employee perceptions of workplace factors that will most improve their performance’, *Performance Improvement Quarterly*, 9, 75–89.


