Holton's Evaluation Model: New Evidence and Construct Elaborations

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The problem and the solution. Holton proposed the HRD Evaluation and Research Model as a comprehensive framework for diagnosing and understanding the causal influences of HRD intervention outcomes. Unfortunately, a full test of Holton's model has not been possible because tools to measure the constructs in the model did not exist. This article reviews recent studies relevant to the constructs in Holton's model and updates it by delineating specific constructs that should be measured in each of the conceptual categories proposed.

Keywords: *HRD evaluation; evaluation models; HRD outcomes; HRD theory; Learning Transfer System Inventory; LTSI*

Holton (1996) sharply criticized Kirkpatrick's (1959) four-level evaluation model and proposed the HRD Evaluation and Research Model as a more comprehensive framework for diagnosing and understanding the causal influences of HRD intervention outcomes. The original model (see Figure 1) was theoretically derived and more conceptually comprehensive than Kirkpatrick's simple four-level taxonomy. Three outcome levels are hypothesized in the model: learning, individual performance, and organizational performance. Following Noe and Schmitt (1986), the macrostructure of that model hypothesizes that HRD outcomes are a function of factors in three construct domains: ability, motivation, and environmental influences. The model further specified conceptual constructs in each domain that are hypothesized to influence each of the three outcome levels. Secondary influences are also included, particularly those that affect motivation to learn.

The model addressed one of the biggest risks of the four-level model, specifically, that any failure to achieve outcomes from an intervention would be attributed to the intervention itself when it could well be due to moderating variables. Perhaps the best example of this is the situation that

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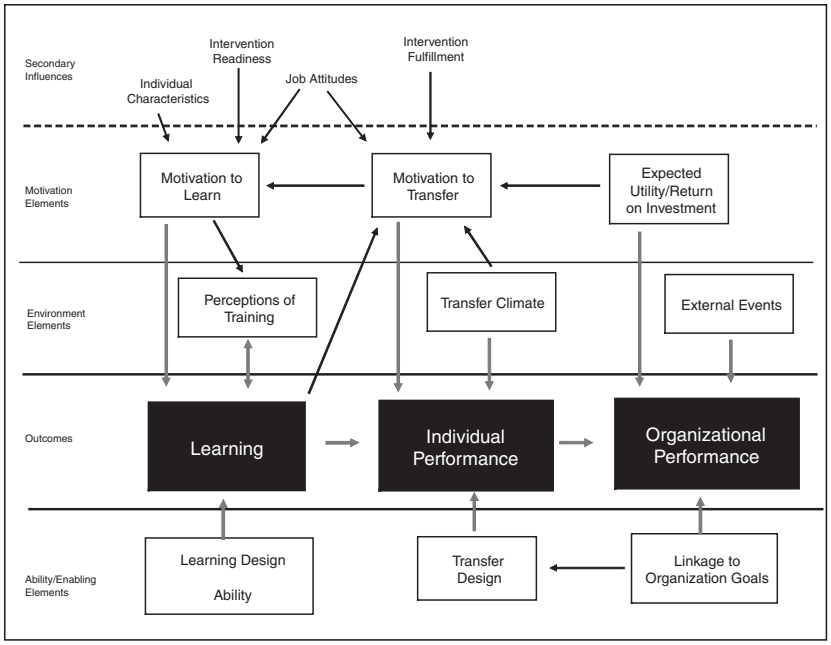

FIGURE 1: HRD Evaluation Research and Measurement Model From Holton (1996)

arises when learning outcomes (level 2) from a training intervention are positive but no on-the-job behavior change occurs (level 3) because the transfer climate is poor. Unless the transfer climate is evaluated, the decision derived from the four-level model would be that the training intervention had failed and needed to be changed. The correct evaluation decision derived from the Holton model would be that the training intervention did not need to be changed but the organization did not have the transfer climate to support it, so an organization development intervention would be needed.

Unfortunately, a full test of my model has not been possible because many of the tools to measure the constructs in the model did not exist. However, since I first proposed my model in 1996, research evidence has continued to accumulate and generally supports it, although some research suggests that modifications are needed. This article reviews selected recent studies relevant to the constructs in my model and updates the model by delineating specific constructs that should be measured in each of the conceptual categories proposed. In certain instances, the model is modified based on new research or theory. The result is an updated version of the model that is more appropriate for empirical testing.

Influences on Learning

This section reviews recent research on factors influencing individual learning outcomes. These are the first domain of outcomes in the model moving sequentially from left to right.

Secondary Influences—Individual Learner Characteristics

Some of the most intriguing research in recent years has been focused on learner dispositional influences on learning, primarily through motivation to learn. Dispositional influences are a general category of individual traits that are relatively stable and enduring and that predispose a person toward certain tendencies or patterns. The best-known example of dispositional characteristics is personality, although there are many others.

Much of the work on personality traits has used the Big Five framework. The Five Factor Model dominates the current view of personality and provides a unifying structure to its study. This model has, in fact, garnered so much support that the FFM "has now become an almost universal template for understanding the structure of personality" (Ferguson & Patterson, 1998, p. 789). As the name implies, this model suggests that there are five broad categories of traits at the top of the personality trait hierarchy. The relatively orthogonal five-factor taxonomy resulted from decades of research on the structure of human personality (Costa & McCrae, 1992) and has gained the support of numerous researchers (e.g., Costa & McCrae, 1995; Digman, 1990; Goldberg, 1990). As highlighted by Costa and McCrae (1992), the five dimensions of the Five Factor Model of personality are neuroticism (or emotional stability), extraversion, openness to experience, agreeableness, and conscientiousness.

Colquitt, LePine, and Noe's (2000) seminal meta-analysis on training motivation research examined research on a variety of influences on learning and transfer outcomes of training. There were a number of important findings in their work relevant to this model. First, two dimensions of the Big Five personality measures were found to influence motivation to learn through pretraining self-efficacy. They were conscientiousness and anxiety (a component of neuroticism). Conscientiousness refers to the extent to which someone is dependable, persevering, hardworking, disciplined, deliberate, and achievement oriented (Herold, Davis, Fedor, & Parsons, 2002, p. 854). It has consistently been linked to motivation to learn and training outcomes (Barrick & Mount, 1991; Colquitt & Simmering, 1998; Naquin & Holton, 2002).

Emotional stability, also known by its opposite trait of neuroticism, reflects the absence of feelings of anxiety, insecurity, and nervousness. It reflects to some degree positive psychological adjustment. People scoring

high on this dimension are generally less anxious and more upbeat in their outlook. Emotional stability has been found to be related to training outcomes, including transfer outcomes (Herold et al., 2002).

Several studies also found that openness to experience, another of the Big Five personality dimensions, is related to both learning and transfer outcomes (Barrick & Mount, 1991; Herold et al., 2002; LePine, Colquitt, & Erez, 2000), although Naquin and Holton (2002) did not find a significant effect for this construct. Openness to experience is associated with intellect, curiosity about one's environment, and a willingness to explore new things. Because training requires persons to embrace new things, this trait should be helpful to trainees (Herold et al., 2002, p. 855).

Naquin and Holton (2002) found support for agreeableness as a predictor, whereas most studies have not. Agreeableness is an interpersonal trait and reflects the degree to which a person is generally a cooperative, compassionate, and trusting person in interpersonal situations. Only limited support has been found, perhaps because its effect is limited to training related to interpersonal skills training.

In sum, three of the Big Five factors—conscientiousness, neuroticism, and openness to experience—have received strong support in the literature, whereas agreeableness has received weak support. Extraversion appears to have no relationship with training outcomes. Thus, the three personality traits with strong support are recommended for inclusions in the model as personality trait measures.

Moving beyond the Big Five, the latest trait to emerge in literature has been goal orientation. Goal orientation posits that individuals are of two types—learning oriented versus performance oriented.

> A learning orientation is characterized by a desire to increase one's competence by developing new skills and mastering new situations. In contrast, performance orientation reflects a desire to demonstrate one's competence to others and to be positively evaluated by others. (p. 498)

Research has shown that individuals with a learning orientation tend to pursue difficult learning challenges and persist in the face of failure of learning difficulties. Persons with a performance orientation tend to see the same situations as threatening and to withdraw from them. Thus, a learning orientation is associated with more positive learning outcomes, whereas a performance orientation is associated with negative or neutral learning outcomes (Bell & Kozlowski, 2002; Chen, Gully, Whiteman, & Kilcullen, 2000; Colquitt & Simmering, 1998; Ford, Smith, Weisbein, & Gully, 1998). Most recently, goal orientation has been shown to have an interactive effect with cognitive ability (Bell & Kozlowski, 2002). Because of the compelling evidence in the literature, goal orientation is recommended as another individual difference variable for the model.

Another dispositional variable that has received recent support in the literature is locus of control (Colquitt et al., 2000). Persons with an internal locus of control tend to have more positive attitudes and motivation toward

training because they are more likely to believe that they can change their abilities and motivation through their own actions. Persons with an external locus of control are more likely to believe that changes in performance are only possible through changes in factors external to themselves. Logically, then, persons with an internal locus of control are more likely to believe that they can improve their skills and performance by exerting effort in training. Locus of control has been shown to be a significant predictor of motivation to learn in Colquitt et al.'s (2000) meta-analysis and thus is recommended for inclusion in the model.

In summary, recent research points to five variables as measures of the individual characteristics category in the Holton Evaluation Model. They are (a) conscientiousness, (b) neuroticism (emotional stability), (c) openness to experience, (d) goal orientation, and (e) locus of control. The original theory posited that the effect of these variables would be fully mediated by motivation to learn. However, Colquitt et al.'s (2000) meta-analysis showed convincingly that these learner characteristics had both an indirect effect through motivation to learn as well as a direct effect on learning. Thus, it seems appropriate to add a path directly from these individual characteristics to learning.

Secondary Influences—Job Attitudes

The second category of secondary influences posited in the Holton model was job attitudes. The theory posits that job attitudes should affect both motivation to learn and motivation to transfer learning. Logically, it presumes that individuals who have more positive attitudes toward their organization would be more likely to engage in learning that will benefit the organization through improved performance. Unfortunately, as Colquitt et al. (2000) note in their meta-analysis, job attitude variables have not received sufficient research attention in the training literature. In fact, most of the job attitude variables could not even be included in their meta-analytic path analysis because of the paucity of studies.

The limited research on job attitudes has focused on several variables. First is job involvement, which has been the most frequently researched job attitude variable and has consistently been shown to be a significant predictor of motivation. Second is organizational commitment. Naquin and Holton (2002) provide compelling evidence of the importance of these variables in their study of the effects of dispositional variables and work attitudes on a construct they identified as Motivation to Improve Work Through Learning (MTIWL). MTIWL is a higher order construct combining motivation to learn and motivation to transfer. In their study, work commitment, which included both job involvement and two dimensions of organizational commitment, was the second strongest predictor of motivation after positive

affectivity. Work commitment also mediated the effects of conscientiousness on motivation. Thus, work commitment was shown to have a strong and direct effect on both dimensions of motivation. However, Colquitt et al.'s (2000) meta-analysis did not find job involvement to be a significant predictor and they were unable to test organizational commitment due to an insufficient number of studies.

Given the limited evidence, it is hard to know definitively which job attitudes to measure. It is clear that more research is needed in this area. Given that there is some evidence supporting job involvement and organizational commitment as predictors of motivation, these two variables are included in the model primarily because they need to be more carefully studied to understand their effect on learning and transfer outcomes.

Perceptions of Training

Perceptions of training, also known as reactions, have been the most controversial domain of evaluation. Kirkpatrick (1998) sanctioned reactions as legitimate outcomes, calling them level 1 outcomes. Holton (1996) demoted them to a moderator variable in the HRD Evaluation and Research Model, based largely on meta-analysis research that has shown low or no relationship between reaction outcomes and higher level outcomes of learning and performance (Alliger & Janak, 1989; Alliger, Tannenbaum, Bennett, Trave, & Shotland, 1997). Swanson and Holton (1999) included them as an outcome but advocated not trying to achieve high levels of reaction results in order not to overemphasize reaction outcomes because doing so often underemphasizes learning and performance outcomes.

Recent research has shed new light on the multidimensionality of reactions and their relationship to learning and performance outcomes. Morgan and Casper (2000) conducted a factor analytic study of a large database of responses to a multidimensional reaction instrument. They demonstrated that reaction measures were, in fact, multidimensional, including a factor they labeled as "Utility Reactions" along with other more typical affective reaction measures. These results were cross-validated with confirmatory factor analysis in a split-sample design. They suggested that models of training effectiveness such as the Holton model might benefit from incorporating a multidimensional treatment of participant reactions.

Two studies have suggested that utility reactions may have some incremental validity in predicting learning or performance outcomes. Tan, Hall, and Boyce (2003) created a utility reaction scale that also incorporated behavioral intentions and tested the effect of the affective and utility reaction measures on learning and performance. Their results showed that one utility reaction scale was a significant predictor over and beyond a pretest in

predicting learning. However, no reaction measures were significant in predicting performance.

Ruona, Leimbach, Holton, and Bates (2002) added support to a role for utility reactions in predicting motivation to transfer learning. In their analysis, they first entered transfer system perceptions into a hierarchical regression model and then forced the utility reaction measure to enter last. Utility reactions were a significant predictor and increased the model R^2 from .41 to .46, suggesting that utility reactions added predictive power over and beyond transfer system perceptions.

Together, this research suggests that perceptual measures of training completed by trainees may have a role in predicting learning and performance outcomes, albeit a small one. It is clear that the research is inconclusive, but it suggests several tentative conclusions. First, there is no support for including affective reactions in the model. No research is emerging that shows that affective reactions have any role in predicting important outcomes from training. Second, research suggests that utility reactions offer small but significant predictive power to the model. Finally, an intriguing new dimension, behavioral intentions, has emerged with a strong theoretical base that warrants inclusion in the model and further testing. Based on these findings, two constructs are recommended for the Holton model for the perceptions of training domain: utility reactions and behavioral intentions.

Influences on Individual Performance

The next domain of outcomes to consider is individual performance. In this section, research on factors influencing individual performance is examined and enhancements to the Holton model are proposed.

Learning Transfer Research

Immediately after publishing the model shown in Figure 1, I began work to move toward a comprehensive test of the model. Unfortunately, there were glaring gaps in both theory and measurement tools that needed to be addressed before any full test was possible. Perhaps the most glaring gap was in the area of transfer climate. At that time, there was no validated framework to define transfer climate nor any generally accepted and validated instrument to measure what was identified in my model as transfer design, transfer climate, and motivation to transfer. My associates and I quickly began to work on a conceptual framework and measurement instrument. Few people realized that it was not learning transfer per se that drove our interest but rather our desire to work toward a comprehensive test of the Holton model.

This program of research now focuses on what we call the learning transfer system, instead of transfer climate (Holton, Bates, & Ruona, 2000). The learning transfer system is defined as all factors in the person, training, and organization that influence transfer of learning to job performance. Transfer climate, the more common term, is actually but one subset of factors that influences transfer, although the term is sometimes incorrectly used to refer to the full set of influences. Other influences on transfer include training design, personal characteristics, opportunity to use training, and motivational influences. Thus, the transfer system is a broader construct than transfer climate but includes all factors traditionally referred to as transfer climate. Transfer can only be completely understood and influenced by examining the entire system of influences.

The instrument that resulted from this program of research is called the Learning Transfer System Inventory (LTSI). It has been well tested with strong evidence of construct validity (Bookter, 1999; Holton et al., 2000), initial evidence of criterion validity (Bates, Holton, Seyler, & Carvalho, 2000; Ruona et al., 2002; Seyler, Holton, Bates, Burnett, & Carvalho, 1998), and good cross-cultural validity (Chen, 2003; Khasawneh, 2004; Yamnill, 2001). The LTSI program of research has resulted in a framework that defines 16 constructs that make up the learning transfer system. Table 1 shows the constructs measured by the LTSI, their definition, and a sample item along with scale reliabilities. These 16 factors are believed to measure the full system of factors that influence learning transfer, although further criterion validation studies are still under way.

The LTSI defines and measures all the variables that should be measured in the transfer design, transfer climate, and motivation to transfer boxes of the Holton model. Figure 2 shows how the constructs of the LTSI map to these three conceptual categories.

Motivation to Improve Work Through Learning

One of the most important developments in the Holton model has been the reconceptualization of the motivation constructs for both learning and transfer. In the original model, motivation was conceptualized in the traditional way, namely, as the two separate construct domains of Motivation to Learn (MTL) and Motivation to Transfer (MTT). As shown in Figure 1, a relationship between the two was posited in that MTT was hypothesized to influence MTL, but they were still conceptualized as separate constructs.

Naquin and Holton (2003) completely reconceptualized motivation by creating the construct MTIWL. The work improvement process in HRD, they argue, is not just a function of learning or training. Rather, it requires learners to acquire knowledge and transfer that knowledge into improved work outcomes or productivity. They further argue that using MTL is too

TABLE 1: Learning Transfer System Inventory (LTSI) Scale Definitions and Sample Items

Factor	Definition	Sample Item	# of Items	α
Training-specific scales				
Learner readiness	extent to which individuals are prepared to enter and participate in training	Before the training, I had a good understanding of how it would fit my job-related development.	4	.73
Motivation to transfer	direction, intensity, and persistence of effort toward using in a work setting skills and knowledge learned	I get excited when I think about trying to use my new learning on my job.	4	.83
Positive personal outcomes	degree to which applying training on the job leads to outcomes that are positive for the individual	Employees in this organization receive various "perks" when they use newly learned skills on the job.	3	.69
Negative personal outcomes	extent to which individuals believe that not applying skills and knowledge learned in training will lead to negative personal outcomes	If I do not use my training, I will be cautioned about it.	4	.76
Personal capacity for transfer	extent to which individuals have the time, energy, and mental space in their work lives to make changes required to transfer learning to the job	My workload allows me time to try the new things I have learned.	4	.68
Peer support	extent to which peers reinforce and support use of learning on the job	My colleagues encourage me to use the skills I have learned in training.	4	.83

(continued)

TABLE 1 (continued)

Factor	Definition	Sample Item	# of Items	α
Supervisor support	extent to which supervisors/managers support and reinforce use of training on the job	My supervisor sets goals for me that encourage me to apply my training on the job.	6	.91
Supervisor sanctions	extent to which individuals perceive negative responses from supervisors/managers when applying skills learned in training	My supervisor opposes the use of the techniques I learned in training.	3	.63
Perceived content validity	extent to which trainees judge training content to accurately reflect job requirements	What is taught in training closely matches my job requirements.	5	.84
Transfer design	degree to which (a) training has been designed and delivered to give trainees the ability to transfer learning to the job, and (b) training instructions match job requirements	The activities and exercises the trainers used helped me know how to apply my learning on the job.	4	.85
Opportunity to use	extent to which trainees are provided with or obtain resources and tasks on the job enabling them to use training on the job	The resources I need to use what I learned will be available to me after training.	4	.70
General scales				
Transfer effort-performance expectations	expectation that effort devoted to transferring learning will lead to changes in job performance	My job performance improves when I use new things that I have learned.	4	.81

(continued)

Performance-outcomes expectations	expectation that changes in job performance will lead to valued outcomes	When I do things to improve my performance, good things happen to me.	5	.83
Resistance/openness to change	extent to which prevailing group norms are perceived by individuals to resist or discourage the use of skills and knowledge acquired in training	People in my group are open to changing the way they do things.	6	.85
Performance self-efficacy	an individual's general belief that they are able to change their performance when they want to	I am confident in my ability to use newly learned skills on the job.	4	.76
Performance coaching	formal and informal indicators from an organization about an individual's job performance	After training, I get feedback from people about how well I am applying what I learned.	4	.70

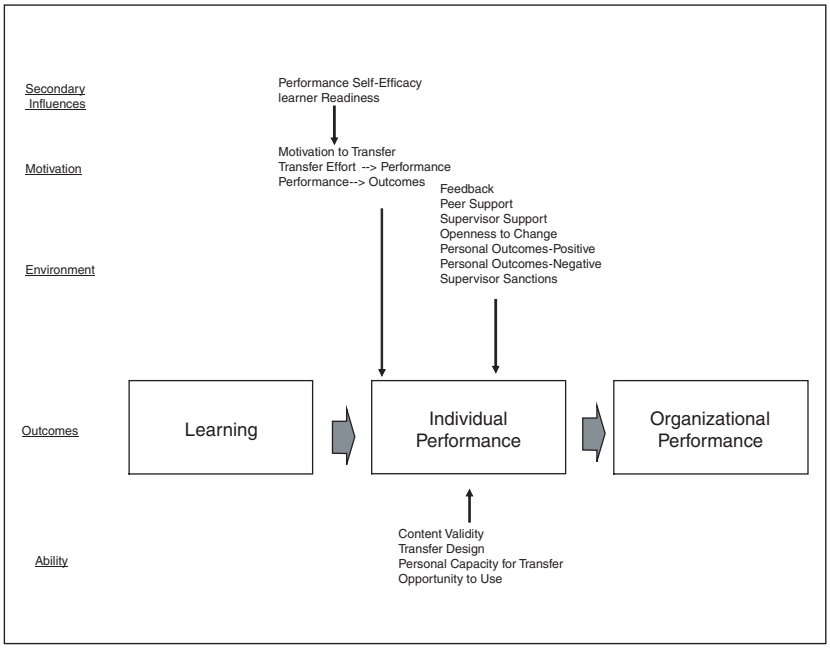

FIGURE 2: Learning Transfer System Inventory (LTSI) Conceptual Map of Constructs

limiting for organizational learning environments. What employees are really engaged in is the process of improving work through the learning process that necessarily entails transferring learning into job application.

MTIWL was defined as

$$\text{Motivation to Improve Work Through Learning (MTIWL)} = f(\text{Motivation to Train, Motivation to Transfer})$$

Naquin and Holton (2003) demonstrated the initial construct validity of this new construct using confirmatory factor analysis.

Although on the surface it might appear that this construct only combines two existing constructs in an additive fashion, the effects are likely to be more significant on outcomes in the Holton model. That is, persons entering a learning situation with high levels of MTIWL are likely to have greater motivation to engage in work-relevant learning experiences offered with strong transfer designs that stress practice and job application than persons with high levels of simple MTL. Thus, the nature of the MTIWL motivation in the learning environment is expected to be substantively different from simple MTL and will demand different types of learning experiences. Further, they can be expected to exhibit higher rates of transfer to individual performance.

Obviously, this new construct remains untested and has unknown criterion validity. However, it is promising enough that I am changing the Holton model to incorporate it and spur research on its validity. The constructs previously included in the MTL and MTT boxes in the model are now integrated into one motivation domain, MTIWL.

Also unknown is whether the relationships found in the literature as discussed above between secondary influences such as dispositional factors, job attitudes, and MTL will also hold true for MTIWL. However, I suggest that it is a short theoretical leap to hypothesize that they will, although only further research will definitively validate them.

Influences on Organizational Performance

Unfortunately, there has been almost no research on factors influencing the transfer of individual performance into organizational performance results. This reflects the almost exclusive focus in training research on the individual level of analysis. It also highlights a serious shortcoming of training research in that the greatest effect on organizations obviously occurs through attaining organizational performance, yet this domain receives the least attention in the literature.

One notable exception is a study by Montesino (2002) in which he examined the linkage between training, the strategic direction of the organization, transfer enhancing behaviors, and usage of training on the job. Several important findings emerged. First, a low to moderate correlation was found between managers' and trainees' engagement in transfer enhancing behaviors and their perceptions that training was congruent with the strategic direction of the firm. This directly supports the relationship in the HRD Evaluation and Research Model between Expected Return/Utility of Training and MTT in that training perceived to be congruent with the firm's strategy is expected to have higher utility and therefore to increase trainee MTT.

Second, trainees who reported very high usage of training perceived a significantly higher alignment of training with the strategic direction of the firm (Montesino, 2002, p. 102). Montesino concludes that

> apparently those trainees who saw more clearly the connection of the training program with the strategic direction of the organization were able to apply on the job the skills they learned in the training program in greater proportion than were the trainees who did not see that connection clearly. (p. 103)

This clearly supports the relationship between Linkage to Organizational Goals and individual performance in the ability domain of the Holton model.

Although this is only one study, it offers clear evidence that the relationships and constructs in my model are promising. Equally evident is that there is a dearth of research in this area and a rich opportunity exists for

additional research into factors affecting the strategic effect of training on organizational performance.

Bates and Khasawneh (2004) provided some additional insight into how this linkage might operate. In their study, they examined the effects of a learning organization culture and selected dimensions of transfer climate on organizational innovation, an important organizational outcome from learning organization interventions. Their results suggested that a learning organization culture had both direct and indirect effects on organizational innovation, with transfer climate constructs partially mediating the effects of the learning organization culture. Thus, this study provides additional evidence that Expected Utility/Return on Investment and Linkage to Organizational Goals are important organizational factors as hypothesized in this model. Learning organizations typically include a strong linkage between organizational goals and learning, presumably resulting in higher perceived return on investment, which should lead to greater motivation to learn. In addition, they have indirect influences through transfer climate as shown in this model by the relationships hypothesized between organizational influences and transfer climate factors at the individual performance level.

Conclusion

This article accomplished three goals. First, it reviewed recent research that supports the Holton Evaluation and Research Model. Second, it provided an update to the model by modifying it to reflect new theory, particularly in the area of motivation. Third, it presented an elaboration of the model by identifying the specific variables that should be measured within each of the conceptual construct domains specified in Holton (1996). By doing so, it moved the model one step closer to empirical testing and validation.

Figure 3 presents the revised model with complete construct definitions, where possible. The obvious challenge that remains is to validate the model. Although complex, I believe that the model can one day be validated, at least in part if not in its entirety. This article and the work that has transpired in the past 8 years have made it now feasible to consider a validation study where it was impossible to even consider 8 years ago. Most likely, the initial validation study will include just the learning and individual performance outcome domains, as much work remains to be done in the organizational performance domain. Nonetheless, tremendous progress has been made and validation looks more feasible than ever before.

A validation effort would likely need to be conducted in steps. First, validation studies could be conducted on a single level of outcomes. For example, researchers would measure all the intervening variables affecting learning as an outcome and test their effect on learning. Or, the intervening

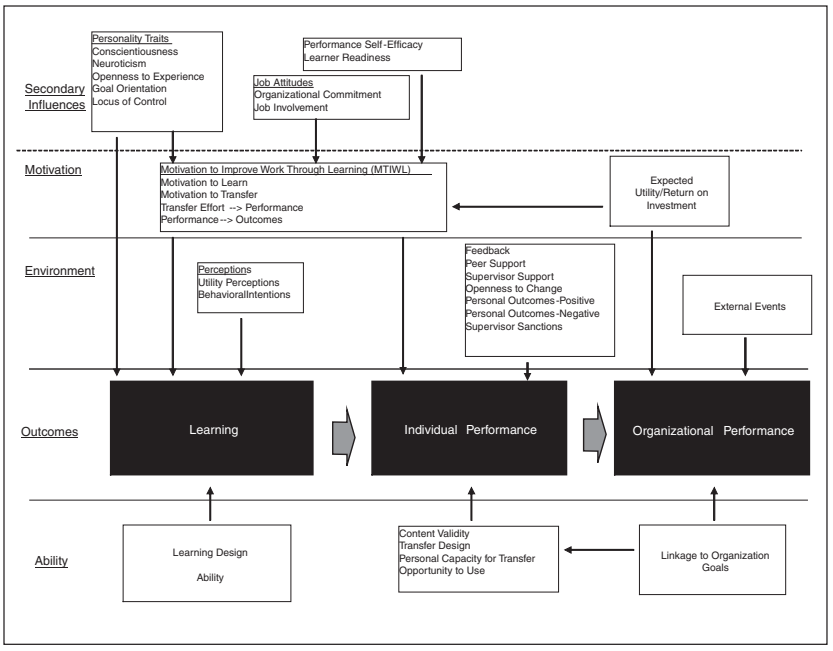

FIGURE 3: Revised HRD Evaluation and Research Model

variables affecting transfer to job performance would be measured and tested for their effect on transfer.

Second, a multilevel analysis that combines the two approaches discussed above could be conducted. Specifically, the intervening variables affecting learning and those affecting performance would be measured and tested for their ability to predict transfer to job performance.

Ultimately, the goal would be to test the entire model. That will require considerable work to define and operationalize constructs influencing organizational results. Montesino's (2002) study is a promising example of the kind of research that can be conducted to further define intervening variables at the organizational level and how they influence both individual transfer and organizational results.

It is clear that these analyses are complex and will require the use of advanced statistical analysis techniques and partners willing to engage in extensive data collection efforts. The validation studies will require structural equation modeling analysis to study the causal relationships hypothesized among the construct. Because the model is a multilevel one, hierarchical linear modeling would likely be employed to analyze the cross-level relationships.

In conclusion, the validation of this model will clearly be ambitious and demanding research. Nonetheless, if the network of causal influences on important HRD intervention outcomes is to be understood, then this type of research is necessary and should be undertaken.

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