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Situational and Demographic Influences on Transfer System Characteristics in Organizations

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Transfer theories, which are closely related to evaluation theory, have been developed from a holistic perspective, but most of empirical transfer research has not effectively utilized holistic models to investigate transfer of learning until the late 1990s. Additionally, little has been done in examining the relationship between situational variables, demographic variables, and transfer system characteristics. This study contributes to transfer research by examining the combined effects of situational and demographic variables on a holistic model of perceived organizational transfer systems. A key finding was that demographic variables make only a marginal contribution to predicting transfer system characteristics when compared to situational variables. It seems clear that the differences in transfer system characteristics depend on diverse situational influences, primarily due to types of training programs and types of organizational cultures. This finding does not support one-size-fits-all transfer interventions. Future research may focus on investigating benchmark transfer practices in certain types of organizations or industries to empirically identify the true leverage points of a diagnosing instrument of transfer—the Learning Transfer System Inventory—for interventions and change.

In the last decade, transfer of learning has become one of the more popular research topics in the field of human resource development and management. A growing body of research investigating factors affecting transfer of learning and their relationships to training effectiveness supports this argument. The terms "transfer of training," "transfer of learning," "learning transfer," "training transfer," and "transfer system" are used interchangeably in the field. Transfer theories, which are closely related to evaluation theory, have been developed from a holistic perspective (e.g., Baldwin & Ford, 1988; Broad & Newstrom, 2001; Noe & Schmitt, 1986; Tannenbaum & Yukl, 1992), but most of *empirical* transfer research has not effectively utilized holistic models to investigate transfer of learning until the late 1990s. Before then, most transfer research focused on specific domains such as individual characteristics, training design, and work environment factors while relatively few assessed transfer from a holistic perspective. In addition, most of the empirical transfer research is limited to one specific type of training, or samples collected in a single organization, university or work group.

One reason that transfer research has been limited is that no instrument was available to assess transfer in complex training contexts. To address this, Holton, Bates, and Ruona (2000) developed the Learning Transfer System Inventory (LTSI), which was grounded in antecedent theories and has received several applications in investigating transfer issues (e.g., Bates & Holton, 2004; Bates, Holton, Seyler, & Carvalho, 2000; Ruona, Leimbach, Holton, & Bates, 2002). One study examined transfer systems—the holistic factors affecting transfer of learning—across eight organizations, three organizational types, and nine training types respectively (Holton, Chen, & Naquin, 2003). The results of the study suggested that transfer systems differ across the three variables they assessed, indicating that transfer barriers and catalysts vary across different contexts and suggesting that

effective interventions to improve transfer should vary depending on the organizational culture and type of organization and training involved.

Although that study was the first to examine transfer systems across settings, several questions remained unexplored. For example, are the transfer systems different simply due to differences in settings? Or, are there any other factors or artifacts that influence transfer systems? Culture research suggests that the way people behave may vary from one country to another, particularly from so-called eastern to western cultures. Thus, another question is whether transfer systems will differ across organizations in another country? And if so, what is the true source of variance that causes transfer systems to differ?

The purpose of this study was to investigate these questions in a setting outside the United States and to extend the findings of Holton et al. (2003). Specifically, this study investigated three situational variables and seven demographic variables in Taiwanese organizations. The situational variables included organizational type, organization, and training type, while the demographic variables included gender, age, levels of education, job types, years of job experience, years of job experience in current organization, and hours of training experience in current organization.

Conceptual Framework, Variables, and Hypotheses

The conceptual framework of this study can be found in Figure 1.

Transfer System Characteristics (Variables)

The transfer system is defined as all factors affecting transfer of learning (Holton et al., 2000). Transfer system characteristics generally include domains such as environment, motivation, ability-related, transfer design, and trainee characteristics factors (Baldwin & Ford, 1988; Noe & Schmitt, 1986). These factors form a unique system that provides either barriers or catalysts to individual performance from applying skills, knowledge, attitudes learned from training to the job. The variables of transfer system characteristics investigated in this study included Learner Readiness, Performance Self-Efficacy, Motivation to Transfer, Transfer Effort-Performance Expectations, Performance-Outcomes Expectation, Positive Personal Outcomes, Negative Personal Outcomes, Peer Support, Supervisor Support, Supervisor Sanctions, Openness to Change, Transferability, Personal Capacity for Transfer, Perceived Content Validity, and Performance Coaching (Chen, Holton, & Bates, 2005). More detailed information about theses variables is discussed in a later section.

Situational Variables

Research assessing situational variables related to transfer of learning or on motivation to enhance training outcomes has been predominately focused on individual or task levels. For example, Mathieu, Tannenbaum, and Salas (1992) examined the effect of individual and situational characteristics on measures of training effectiveness. The situational variables they assessed included career planning and job involvement. Gist and Mitchell

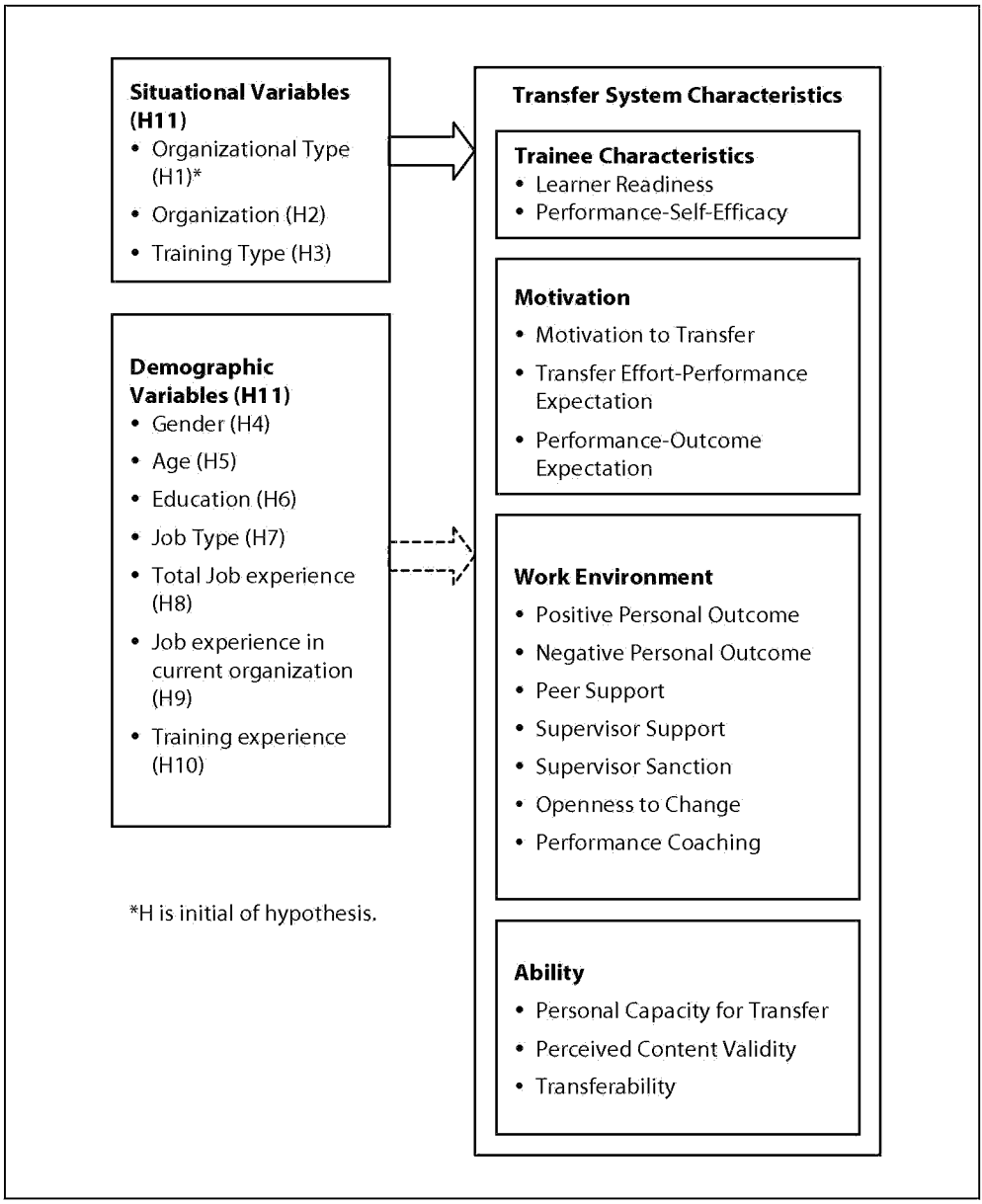

FIGURE 1. Conceptual framework.

(1992) asserted that external variables (e.g., task difficulty and complexity) would influence individual self-efficacy.

However, situational influences also exist at other levels such as the organization and training levels. Tziner, Haccoun, and Kadish (1991) pointed out that situational characteristics could affect the perception of trainees with regard to supports they would receive from their work environment to apply what they learned. Such supports are linked to organizational culture or climate. Indeed, every organization has a unique culture that influences

its functions and services. Therefore, organizational culture that includes work environment factors (e.g., supervisor support and peer support) would be expected to influence transfer.

In addition, similar types of organizations (e.g., public, private, and not-for-profit organizations) could also exhibit similar transfer systems. For example, bureaucratic systems in the public sector may impede trainees' efforts to apply new skills to their jobs. In terms of training type, organizational policies may reinforce certain types of training (e.g., leadership development) while inadvertently overlooking other types of training (e.g., literacy training and diversity training).

Accordingly, three hypotheses were investigated in Taiwanese organizations:

- **Hypothesis 1**: *There will be significant differences in transfer system characteristics across organizational types in Taiwan.*
- **Hypothesis 2**: *There will be significant differences in transfer system characteristics across organizations in Taiwan.*
- **Hypothesis 3**: *There will be significant differences in transfer system characteristics across training types in Taiwan.*

Demographics Variables

As indicated, research assessing individual variables and their influences on transfer outcomes has been fruitful. Current literature and theory in relation to individual characteristics generally focuses on self-efficacy (Davis, Curtis, & Tschetter, 2003; Gaudine & Saks, 2004; Gist & Mitchell, 1992; Holladay & Quinones, 2003; Karsten & Loomba, 2002), goal setting (Machin & Fogarty, 2003; Morin & Latham, 2000; Wexley & Baldwin, 1986), and cognitive ability (Carter, 2002; Pennington & Nicolich, 1995). However, demographics or achieved attributes of individuals have been rarely researched empirically (Colquitt, LePine, & Noe, 2000). One of the purposes of this study was to address this research gap by examining the effect of various demographic variables on perceptions of transfer systems. Because other research on individual variables has demonstrated that individual variables affect transfer, it is hoped that this research will lead to a better understanding of the sources of variance in transfer systems. Therefore, seven demographic variables were investigated.

Gender. Research investigating the effect of gender on learning or training outcomes has not yet shown consistent results. For example, Stevens, Bavetta, and Gist (1993) examined gender differences in negotiation skills and found no differences between genders in performance when individual goals were controlled for. On the other hand, Tziner and Falbe (1993) investigated the relationships among gender, training-related variables, and training outcomes. Gender effect was found on motivation to transfer in their study. Weiss, Kemmler, Deisenhammer, Fleischhacker, and Delazer (2003) investigated gender differences in verbal and visual-spatial functions. They found that women tended to perform better than men on verbal tests, while men outperform women on visual-spatial tasks. Vasta, Knott,

and Gaze (1996) found that spatial training helped reduce gaps in learning outcomes between genders. Waller, Hunt, and Knapp (1998) found gender differences in training effectiveness in virtual environments. Therefore, the following hypothesis was investigated:

> **Hypothesis 4**: *There will be significant differences in perceptions of transfer system characteristics between trainees' genders in Taiwan.*

Age. Kubeck, Delp, Haslett, and McDaniel (1996) conducted a meta-analysis investigating the relationship between age and job-related training outcomes. They found that older adults showed less mastery of training material than younger adults. Cleveland and Shore (1992) found that age was negatively related to workers performance in on-the-job training. From an individual development perspective, younger workers seem more willing to engage in self-development activities than other workers (McEnrue, 1989). When information technology is involved, older workers appear to have higher anxiety about the training than younger workers. Therefore, the following hypothesis was investigated:

> **Hypothesis 5**: *There will be significant differences in perceptions of transfer system characteristics between different ages of trainees in Taiwan.*

Level of education. Research testing the effect of educational level on training effectiveness has been sparse. Nafukho and Hinton (2003) examined the relationship between drivers' levels of education and job performance in Kenya. They found that there was no relationship between levels of education, training, and job performance. However, the cell sizes of the educational levels in the study were extremely unequal (the ratio of largest to lowest was 24:1) and one of the cells contained only three respondents. On the other hand, human capital theory has supported education and training as having an effect on learning outcomes and job performance (Becker, 1993). Therefore, it seems plausible that level of education may have some effect on transfer of learning perceptions. Therefore, the following hypothesis was investigated.

> **Hypothesis 6**: *There will be significant differences in perceptions of transfer system characteristics between different levels of trainees' education.*

Job types. Transfer research investigating the relationship between job function and transfer of learning has also been scarce. However, different jobs represent various roles and functions within an organization. It seems logical that natural differences in job functions of trainees could alter their perceptions about the applicability or transferability of skills learned. Therefore, the following hypothesis was investigated:

> **Hypothesis 7**: *There will be significant differences in perceptions of transfer system characteristics between different types of jobs.*

Years of job experience, years of job experience in current organization, and hours of training experience in current organization. In this study, though not mutually exclusive, the three experience-related variables were treated differently. Years of job experience characterize individuals' variety of knowledge in experiencing tasks and functions in different organizations. It represents a general job experience construct. However, the measure for job experience in current organization captures the experience that an individual has in their current organization which would be expected to be shaped in part by the organization's culture. Hours of training experience in the current organization reflect the trainees' experience with training within that organization's culture.

The theoretical foundation for investigating these three variables comes from experiential learning theory (Dewey, 1938; Kolb, 1984; Juch, 1983) and adult learning theory (Knowles, Holton, & Swanson, 2005). As Kolb suggested, learning occurs through a cycle of a four–stage experiential learning process including concrete experience, reflective observation, abstract conceptualization, and active experimentation. Adult learning theory, particularly andragogy, suggests that adults' prior job and learning experiences will significantly affect their learning. Some empirical research has supported the relationship between experience, learning, and performance. For example, Hook and Bunce (2001) asserted that training experience is related to later training learning outcomes. Dorsey, Campbell, Foster, and Miles (1999) suggested that certain types of prior experience have a significant relationship with post-training performance. Sinclair, Smith, Colligan, Prince, Nguyen, and Stayner (2003) found no relationship between inquiry experience and safety knowledge in a safety training program. However, they suggested further investigation due to methodological issues in the study.

Therefore, the following hypotheses were investigated:

- **Hypothesis 8**: *There will be significant differences in perceptions of transfer system characteristics between trainees with different years of job experience in Taiwan.*
- **Hypothesis 9**: *There will be significant differences in perceptions of transfer system characteristics between trainees with different years of job experience in their current organization in Taiwan.*
- **Hypothesis 10**: *There will be significant differences in perceptions of transfer system characteristics between trainees with different hours of training experience in their current organization in Taiwan.*

Relationship between Demographic and Situational Variables

The hypotheses proposed above ignore the combined influence of situational and demographic factors. Because no previous research has been conducted in this area, it is unknown whether they would contribute uniquely to the prediction of transfer system perceptions, or whether they would interact. However, the empirical research reviewed in the previous section indicates that consensus has not been reached on how demo-

graphic variables, particularly for gender and level of education, relate to transfer factors. On the other hand, research findings have been constant in relating the influence of situational variables to transfer factors. Accordingly, it seems logical to assume that situational variables should be the most powerful predictor because of the situational nature of training in organizations. Therefore, the following hypothesis was investigated:

> **Hypothesis 11**: *When situational variables and demographic variables are combined in predicting perceptions of transfer system characteristics, situational variables will be the primary source of variance.*

Research Methods

This study was a cross-cultural survey research and is part of an ongoing data collection endeavor to research transfer issues in Taiwan. Data was selected from a database containing more than 800 responses to the Taiwanese version of the LTSI (TLTSI). Among the responses, 583 were collected from the first version of the TLTSI, while the rest of the data was collected using an extended version of the instrument. The target population was employees who attended training programs within or outside their organizations in Taiwan. Accidental and purposive sampling techniques (Ary, Jacobs, & Razavieh, 1996) were used to collect the data from different training participants in various organizations. The accidental sampling, or so-called convenience sampling, was achieved through researchers' accessibility to the subjects. On the other hand, the purposive sampling allowed the researchers to include diversified samples (e.g., different organizational types, organizations, and training types) so the research purposes can be achieved. All of the TLTSI instruments were completed by trainees either immediately after training or no later than two weeks after training. Participation was voluntary and anonymous.

Instrumentation

The instrument used in this study was the Taiwanese version of the Learning Transfer System Inventory (TLTSI). The original version was developed in English and has been shown to be a valid and generalizable instrument to diagnose transfer systems' strengths and weaknesses in organizations. The TLTSI was rigorously translated through forward-back translation methods and subjective and objective evaluations to the translation. The instrument was then factor-analyzed from data collected in organizations in Taiwan. It contains 15 validated factors with 76 items validated for use in Taiwan (Chen et al., 2005). All of the items use five-point Likert-type scales with responses ranging from 1=strongly disagree to 5=strongly agree. Additional items were also included in the instrument to collect demographic and organizational data. The TLTSI factors' names, definitions, and coefficient alpha reliabilities can be found in Table 1.

TABLE 1
TLTSI SCALE DEFINITIONS AND SAMPLE ITEMS

Factor	*Definition*	*Sample Item*	*# of Items*	α
Trainee Characteristics Factors				
Learner Readiness	The extent to which an individual knows expected outcomes of the training and understands how the training is prepared for them prior to participating in training.	Before the training I had a good understanding of how it would fit my job-related development.	3	.65
Performance Self-Efficacy	The extent to which an individual's belief in self on overcoming obstacles to change his or her performance.	I am confident in my ability to use newly learned skills on the job.	4	.86
Motivation Factors				
Motivation to Transfer	The extent to which an individual's willingness and excitement to try out new learning to the job and belief in new skills will help him or her improve job performance.	I get excited when I think about trying to use my new learning on the job.	4	.83
Transfer Effort–Performance Expectations	The extent to which an individual's belief and expectation in effort will lead to performance improvement.	My job performance improves when I use new things that I have learned.	4	.85
Performance-Outcomes Expectations	The extent to which an individual expect that changes in job performance will lead to valued outcomes.	For the most part, the people who get rewarded around here are the ones that do something to deserve it.	5	.80
Work Environment Factors				
Positive Personal Outcomes	The extent to which applying training on the job leads to outcomes, which are positive for the individual. The positive outcomes may include pay raise, incentives, non-monetary rewards, and public recognition.	If I use this training I am more likely to be rewarded.	7	.91
Negative Personal Outcomes	The extent to which an individual believes that *not* applying skills and knowledge learned in training will lead to outcomes that are negative. The negative outcomes may be oral warning, tangible penalty, notification, and some type of punishment.	If I do not utilize my training I will be cautioned about it.	4	.79

Peer Support	The extent to which an individual's peers reinforce and support use of learning on the job. The reinforcement and support may include a peer's appreciation, encouragement, expectation, and patient to the individual's efforts in transferring learned knowledge and skills to his or her job.	My colleagues encourage me to use the skills I have learned in training.	4	.89
Supervisor Support	The extent to which an individual's supervisors or managers reinforce and support use of training on the job. The reinforcement and support may include supervisor's or manager's accessibility, addressing concerns on a regular basis, demonstration of interest about work problems, facilitation of achievable goal setting for the individual in relation to transfer issues.	My supervisor helps me set realistic goals for job performance based on my training.	6	.92
Supervisor Sanctions	The extent to which an individual perceives negative responses and actions from his or her supervisors or managers as applying skills and knowledge learned in training. Negative responses and actions may include objection, negatively tacit cues, lack of interests, and critiques in relation to transfer issues.	My supervisor thinks I am being less effective when I use the techniques taught in this training.	8	.92
Openness to Change (reverse coded)	The extent to which an individual perceives that group norms are to resist or discourage the application of skills and knowledge learned in training.	Experienced employees in my group ridicule others when they use techniques they learn in training.	6	.80
Performance Coaching	Formal and informal indicators from an organization about an individual's job performance. The indicators may include advice, suggestions, feedback, and conversation from others.	After training, I get feedback from people about how well I am applying what I learned.	6	.88
Ability Factors				
Personal Capacity for Transfer	The extent to which an individual has the time, energy and mental space in their job to transfer learned skills and knowledge to the job.	My workload allows me time to try the new things I have learned.	5	.78
Perceived Content Validity	The extent to which an individual judges the match between training content and job requirements.	The methods used in training are very similar to how we do it on the job.	3	.84
Transferability	The extent to which an individual perceives that training is designed to facilitate opportunities to apply what they learn to the job. Opportunities may include resource availability in the job and case examples and participation in the training.	The way the trainer(s) taught the material made me feel more confident I could apply it.	7	.92

Source: Chen et al. (2005, pp. 73-75).

Data Analysis

Multivariate Analysis of Variance (MANOVA) was used in this study. The 15 validated transfer factors representing transfer system characteristics were treated as dependent variables while the independent variables were the 10 proposed situational and individual variables. Only data collected from the first version of the TLTSI were included so that all data came from the same version of the instrument.

The first step in the analysis was to examine the individual cell sample sizes because it is suggested that each cell in the MANOVA should have a minimum cell size of 30 (Hair, Anderson, Tatham, & Black, 1998). Cells with a sample size less than 30 were excluded in the analysis. In terms of Hypothesis 1, five groups were analyzed: public sector, private sector, not-for-profit organizations, public-for-profit organizations, and educational organizations. Analysis for Hypothesis 2 included eight different organizations. These organizations included one government agency, three manufacturers (in electronic, petroleum, and telecommunication industries), two insurance companies, one service-based organization, and one retailer. With regard to Hypothesis 3, most of the respondents were clustered into eight different training groups. The training groups included: new employee training, spiritual inspiration, managerial (e.g., leadership development, middle level managerial training, etc.), curriculum design (e.g., curriculum design, curriculum development, and train the trainer), technical (e.g., computer skill training, software development, etc.), safety (safety and security training), operations management (e.g., asset management, material management, project management, river management, etc.), and interpersonal relations (e.g., communication skill, negotiation skill, interpersonal relationship, etc.) training programs. For Hypothesis 4, two groups, male and female, were analyzed. For Hypothesis 5, groups were categorized as "30 or younger," "31 to 40," "41 to 50," and "51-65." For Hypothesis 6, four groups—high school or below, quasi-college, college, master and doctorate—were categorized. For Hypothesis 7, seven types of jobs including engineer, top manager, mid-low manager, social worker, service worker, educator, and professional staff were analyzed. For Hypotheses 8 and 9, years of job experience and years of job experience in current organization were each composed of four groups: "3 or fewer," "4-10," "11 to 20," and "21 or more." For Hypothesis 10, hours of training experience in current organization was categorized into two groups: "100 or fewer" and "more than 100."

Except for Hypotheses 4, 10 and 11, one way MANOVA, Univariate Analysis of Variance (ANOVA), and post hoc comparisons with Scheffe adjustment and significance level of .05 were used to assess the transfer system characteristics (factors) across levels for each of the situational and demographic variables. Hotelling's T^2 was used to examine transfer system characteristics between genders (Hypothesis 4) and between hours of training in current organization (Hypothesis 10) because these two independent variables only contained two levels. In addition, two-way MANOVAs were used to examine the relative contribution of situational and demographic variables in predicting transfer system variance (Hypothesis 11).

Before the data was analyzed, several checks on the data were conducted, including checking for out-of-range scores, violations of MANOVA assumptions and the presence of outliers. Corrections were made where appropriate. For examination of normality, a histogram for each item was used instead of checks for a significant level of skewness which is less useful with a large sample size (Tabachnick & Fidell, 1996). No serious violations of normality were found.

Results

Hypothesis 1: *There will be significant differences in perceptions of transfer system characteristics across organizational types.*

The ratio of the largest group to the smallest group was 4.53:1 which was within an acceptable range. MANOVA analysis showed statistically significant differences across organizational types (Wilks' Lambda=.387, F=7.723, P<.001) implying that the transfer systems differ across organizational types.

Post-hoc ANOVAs showed that all factors except Learner Readiness, were significantly different across organizational types. In the post hoc paired comparisons, the most interesting finding was that the transfer system appeared to be most robust in not-for-profit organizations because 48 out of 52 paired comparisons of the not-for-profit organizations across the four categorized factor groups (trainee characteristics, motivation, work environment, and ability) were significantly different from other types of organizations. It was a little surprising that there was only one significant difference found in the comparisons between public and private sectors. The results showed that respondents in the private sector perceived higher positive personal outcomes than respondents in the public sector. However, this is typical when comparing public and private sector organizations because incentives are more common in the private sector.

Contrasting the two public-founded organizational types, public sector and public-for-profit sector, the results showed that respondents in the public-for-profit sector rated two of the ability-related factors (Perceived Content Validity and Transferability) significantly higher than respondents in the public sector. Finally, four paired significant differences were found between two profit-oriented organizational types—private sector and public-for-profit organization. Respondents in public-for-profit organizations rated Performance-Self Efficacy, Personal Positive Outcome, Perceived Content Validity, and Transferability significantly higher than respondents in the private sector.

Hypothesis 2: *There will be significant differences in perceptions of transfer system characteristics across organizations.*

The ratio of largest group to smallest group was acceptable at 2.70:1. MANOVA analysis showed that significant differences were found across organizations (Wilks' Lambda=.220, F=5.491, P<.001). The results suggested that transfer systems differ across different organizations.

Univariate ANOVA showed that all factors were significantly different across organizations with the exception of Learner Readiness. In terms of post hoc comparisons, one organization (a not-for-profit organization) appeared to have a stronger transfer system than any other organization in this study. Except for Learner Readiness, which did not show any significant differences, respondents in this organization rated their transfer system significantly better than at least five other organizations on all factors. The "better" referred to respondent's ratings in the particular organization on positive scale (e.g., Supervisor Support) significantly higher and negative scale (e.g., negative personal outcome) significantly lower than respondents in other organizations. Two insurance companies in this study appeared to have similar transfer systems. Only four factors (Performance Self-Efficacy, Negative Personal Outcomes, Supervisor Support, and Performance Coaching) were significantly different between these two insurance companies. Similar, but not identical, transfer systems were also found in the three manufacturing organizations in this study.

Hypothesis 3: *There will be significant differences in perceptions of transfer system characteristics across training types.*

The ratio of largest group to smallest group was acceptable at 3.33:1. MANOVA analysis showed statistically significant differences across training types (Wilks' Lambda=.272, F=4.41, P<.001). Univariate ANOVA analysis showed that all TLTSI factors were significantly different across training types. The results indicated that the supports or obstacles of transfer systems in organizations vary across training contents.

In terms of post hoc paired comparisons, the most notable finding was that respondents who attended the spiritual inspiration training perceived a stronger transfer system than any other type of training in this study. Respondents who attended the spiritual inspiration training rated all factors significantly better than at least 5 other training types with the sole exception of Leaner Readiness. When comparing new employee training and managerial training, new employee training was rated significantly higher than managerial training in four scales (Positive Personal Outcome, Negative Personal Outcome, Supervisor Support, and Performance Coaching), and all of them were work environment-related factors.

Hypotheses 4-10: *There will be significant differences in perceptions of transfer system characteristics across gender, age, level of education, job types, years of job experience, years of job experience in current organization, and hours of training experience in current organization.*

The analysis procedures for Hypotheses 4-10 (the 7 individual variables) were the same as those for Hypotheses 1-3. However, when these one-way MANOVAs or Hotelling's T^2 were conducted individually, all 7 individual variables showed significant differences on transfer system factors. The results of Hypotheses 4-10 are summarized in Table 2.

TABLE 2
RESULTS OF MANOVAS AND HOTELLING'S T^2 FOR DEMOGRAPHIC VARIABLES

Demographic Variables	*Wilks' Lambda*	*F*	*P-value*
Gender (H4)*	.868	4.233	<.001
Age (H5)	.768	2.671	<.001
Level of education (H6)	.786	2.074	<.001
Job type (H7)	.460	3.698	<.001
Years of job experience (H8)	.747	2.824	<.001
Years of job experience in current organization (H9)	.728	3.011	<.001
Hours of training experience in current organization (H10)*	.831	4.219	<.001

*Hotelling's T^2 was used due to the independent variables contains only two levels

Hypothesis 11: *When situational variables and demographic variables are combined in predicting perceptions of transfer system characteristics, situational variables will be the primary source of variance.*

It is clear that when 10 separate sources of variance (three situational variables and seven demographic variables) were found to be significant in separate analyses, the type I error has likely been inflated. Hypothesis 11 was formed to investigate the primary source of variance. The ideal approach would have been to include all of the independent variables into the MANOVA analysis to further examine if there were some interaction that might exist among these variables. Unfortunately, the sample size was insufficient to allow this. Thus, a decision was made to extend the analyses to two-way MANOVAs by crossing each of the situational variables in Hypotheses 1-3 with each of the demographic variables in Hypotheses 4-10. A summary of the results can be found in Table 3.

A total of 42 two-way, factorial MANOVAs were conducted. Twenty-one MANOVAs were run by pairing each situation variable with each demographic variable as an independent variable. The rest of the MAVOVAs were identical variable pairings, but reversed the order of entry of each pair.

The results showed that in all of the two-way MANOVAs, the situational variables had a significant main effect no matter what the order of entry is. Furthermore, in seventeen out of the 21 two-way MANOVAs, the situational variables were the only significant variable with no interaction effect regardless of the order of entry. Thus, four out of the seven demographic variables (gender, age, job type, total job experience) had no main effect when entered into the MANOVA analysis with situational variables.

For level of education, it seemed to have a main effect when entered with organizational type and organization; however, it did not have significant main effect when entered with training type. Therefore, it is likely that training type is the true source of variance and not level of education. One two-way MANOVA (job experience in current organization versus orga-

TABLE 3
RESULTS OF TWO-WAY MANOVAS

		Situational Variables		
		Organizational type	*Organization*	*Training type*
Demographic Variables	*Gender*	No interaction Org type-main effect	No interaction Org-main effect	No interaction Training type-main effect
	Age	No interaction Org type-main effect	No interaction Org-main effect	No interaction Training type-main effect
	Education	No interaction Org type-main effect Education-main effect	No interaction Org-main effect Education-main effect	No interaction Training type-main effect
	Job types	No interaction Org type-main effect	No interaction Org-main effect	No interaction Training type-main effect
	Job experience	No interaction Org type-main effect	No interaction Org-main effect	No interaction Training type-main effect
	Job experience in current organization	No interaction Org type-main effect	Interaction Org-main effect	No interaction Training type-main effect
	Training experience in current organization	No interaction Org type-main effect	No interaction Org-main effect Training experience in current organization-main effect	No interaction Training type-main effect

nization) had an interaction effect. This is likely a spurious result because both variables referred to the trainee's current organization. An interaction could be expected but is essentially meaningless. The situational variables were the only source that showed a significant main effect. Last, in terms of training experience in current organization, it had a main effect when entered with organization. However, it did not have significant main effect when entered with organizational type and training type. Again, it seems likely that organizational type or training type is the true source of variance rather than training experience in current organization. Thus, the results of the two-way MANOVAs generally suggested that the sources of variance were from situational variables, not demographic variables.

Discussions and Limitations

The results of Hypotheses 1-3 suggest that transfer systems significantly differ across organizational type, organization, and training type,

which is consistent with the similar study, conducted in the U.S. (Holton et al., 2003). In comparing factors of transfer systems across organizational types, the results showed that the not-for-profit organization appeared to have a stronger transfer system than other organizational types in this study. Employees in the private sector perceived higher personal positive outcomes than employees in the public sector. Also, employees in the public-for-profit sector had a stronger belief in self for overcoming obstacles to change performance, belief that applying training to the jobs will lead to positive outcomes, belief in a match between training content and job requirements leading to performance improvement, and belief that training should be designed to facilitate opportunities to apply what they learn to the job than employees in the private sector. However, employees in the private sector perceived more positive personal outcomes than respondents in public-for-profit organizations.

Two insurance companies showed similar transfer systems as did the three manufacturers, implying that similar types of organizations share similar transfer systems. This can be explained by the similarity of culture, tasks, functions, and interrelationships among employees in similar types of organizations. Nevertheless, these transfer systems were not identical. The significantly different factors could be the leverage points that those particular organizations need to improve in order to enhance transfer. This finding supports the notion that organizations may have different strengths and weaknesses in their transfer systems.

The comparisons among training types suggest that respondents who attended the spiritual inspiration training perceived a stronger transfer system than respondents who attended any other training programs in this study. This finding can be explained from the individual, group, and organizational levels. From the individual level, employees may perceive this particular training has great value to enhance personal growth so the motivation to transfer and positive personal outcomes are expected to be high. At the organizational level, to boost morale and ethics, organizations' policies may value this type of training highly. These policies likely created a positive work environment support (e.g., supervisor and peer supports) at the group level.

As mentioned, research examining the effects of demographic variables on transfer system perceptions has been sparse, and most of them were used as control variables. This study empirically examined the effect of demographic variables on perceptions of transfer system characteristics to help understand the role of demographic variables in transfer of training. As hypothesized, although all of the demographic variables appeared to be significant, when considered jointly with situational variables the demographic variables had little influence. As a result, the pervasive significant differences in transfer systems across situational variables found in Taiwanese settings have strengthened the findings of other studies.

While this study contributes to our understanding of transfer systems across different settings, the authors also acknowledge the limitation of purposive and accidental sampling techniques used in this study. Some types

of organizations (e.g., banking and health profession) which rely heavily on training to develop employees were left out of this study. Regardless, several critical procedures were carried out to enhance validity and appropriateness in this study. For example, the validated instrument used in this study strengthens the validity of the measures. In selecting data used for analysis, the temptation of including respondents from more organizations in the comparisons was avoided. Instead, the authors excluded small cell size of respondents to make sure the ratio of sample sizes was appropriate, thereby lessening the chances of spurious statistical results. Last, the findings in part are limited by self-perceived responses.

Implications and Future Research Directions

Enhancing the degree to which trainees apply what they learned from training back to the job is a complicated task because it involves a complex system of factors (e.g., trainees' characteristics, motivation, work environment, and ability factors). The lack of systematic diagnosis of factors affecting transfer of learning is one key reason that some training is not as effective as it should be. As demonstrated in this study, it is clear that some employees in some types of training will experience stronger transfer system characteristics than other types. Accordingly, one-size-fits-all transfer system interventions are not supported by the findings of this study because of the differences of transfer system across organizations, organizational types, and training types.

To maximize the payoff from training budgets, organizational decision makers should prioritize transfer issues for core training programs and make certain that no obstacles impede trainees transferring learned skills back to the jobs. Organizational policies (e.g., incentives and mandates for training and transfer) and culture (e.g., support from management) should foster a positive transfer climate within organizations.

Currently the practical application of the LTSI to determine leverage points for interventions to improve transfer systems relies on an expert's judgment because research has not established an optimal norm level for components of an organization's learning transfer system due to the variety of transfer systems across organizations. However, this study moves transfer research one step closer to empirically identifying leverage points for change. Specifically, as seen in this study, results from similar types of organizations exhibit similar, though not identical, transfer system characteristics which suggests that investigating benchmark transfer practices in certain type of organizations or industries may help reveal such leverage points.

Some research in western cultures has found that work environment factors (e.g., supervisor support and peer support) exhibit critical influences on transfer behavior (Bates et al., 2000; van der Klink, Gielen, & Nauta, 2001). Hofestede (2001) found that Taiwan's national culture is collectivism with large power distance, while the U. S. is the opposite (individualism and small power distance). Thus, supervisor and peer support factors should

be even more important for behavior change in Taiwan. HRD practitioners in Taiwan need to take initiatives to educate managers on how to support transfer of learning as well as to understand the importance of work environment factors that influence individual transfer of learning. Future research should attempt to identify leverage points for change by benchmarking organizations with best transfer practices in different industries, organizations, and training types. Other directions for research include collecting data from other types of organizations and assessing additional factors which may influence transfer, particularly individual factors such as personality, to examine issues across transfer systems.

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