Motivation to Transfer Revisited

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Abstract: Should the construct 'motivation to transfer' used in human resource development and management research be also used in learning research? The current study revisited motivation to transfer on a sample of 128 participants of occupational health training. Confirmatory factor analysis and partial least squares-based path modeling were used to test the hypothesized dimensions and relationships among variables including social and affective cues on training transfer. Based on a combination of the theory of planned behavior, expectancy theory, and self-determination theory, we validated three dimensions of transfer motivation: autonomous motivation to transfer, controlled motivation to transfer, and intentions to transfer. Results indicate that autonomous motivation was affected by attitudes toward training content and utility reactions; controlled motivation was affected by utility reactions, supervisory support, and social norms. Intentions to transfer mediated the effects of autonomous motivation on transfer three months after training. Implications of a multidisciplinary perspective combining learning sciences and human resource development are discussed.

The Noe Model Revisited

In 2006, in a discussion on how motivation influences transfer, Pugh and Bergin (p. 155) recommended adopting the construct motivation to transfer from the human resource development (HRD) literature to the learning sciences; their recommendation was published in a highly influential journal in the field, *Educational Psychologist*. Twenty years earlier, Raymond Noe coined the term 'motivation to transfer' that Pugh and Bergin were referring to as "the trainees' desire to use the knowledge and skills mastered in the training program on the job" (Noe, 1986, p. 743). His work was published in a highly influential journal in the field of management and HRD, *Academy of Management Review*. It is argued here that it would be fatal if learning scientists followed Pugh and Bergin's advice to adopt the construct from HRD research to learning research. This is for five reasons. First, motivation to transfer currently is a one-dimensional construct that is too coarse to adequately reflect motivational states and traits in the transfer process. Second, motivation to transfer currently is not, and was not, adequately grounded in motivation theories. Third, there is poor empirical evidence in the HRD and management literature on how motivation to transfer affects transfer of learning. Fourth, motivation to transfer currently is a static construct, only measured immediately following an intervention. Finally, Noe (1986) said little in his original conceptualization about the social origin of transfer motivation; this reflected the zeitgeist of the 1980s epoch. Learning researchers now can be thoughtful in adopting a more balanced view.

It is argued further that motivation to transfer does indeed play a central role in the transfer process; there is enough theoretical (and common sense) backdrop to expect that learners who are motivated to apply training content from training to work, or from the classroom to out-of-classroom use, are more likely to be successful than learners who are not motivated. Yet, in its current form, motivation to transfer seems to be a construct powerless to account for intentional transfer processes. Transfer, from a human resource perspective, is defined as the successful application of newly trained knowledge, skills, and attitudes to the workplace (Noe, 1986; Burke & Hutchins, 2007). Hence, we argue that before following Pugh's and Bergin's recommendation, Noe's model of motivation to transfer must be revisited in several significant respects: dimensionality, theoretical grounding, empirical evidence, measurement time, and social nature of motivation.

On revisiting dimensionality, motivation to transfer has been measured as a one-dimensional construct in empirical training research over the past twenty-five years or so (Noe & Schmitt, 1986; Velada, Caetano, Bates, & Holton, 2009). In our recent review on motivation to transfer (Gegenfurtner, Veermans, Festner, & Gruber, 2009), we found that all 31 studies on transfer motivation reported in international peer-reviewed journals from 1986 to now used a one-dimensional scale to assess the construct, ranging from one item to eleven items. This is a paradox since motivation researchers have explored numerous dimensions of motivational processes in human actions. To name just a few, we know of intrinsic and extrinsic motivation; conscious goal intentions and unconscious implementation intentions; expectancies, instrumentalities, and valences; various types of motivational regulation and mindsets; and we differentiate motivation, volition, and emotion. All contribute to our understanding of the many facets and colors that motivation has. Motivation to transfer

potentially goes in concert with all of the dimensions just mentioned. It can be argued that motivation to transfer has remained a one-dimensional construct to date because it lacks a clear grounding in motivation theories.

On revisiting theoretical grounding, Noe (1986; Noe & Schmitt, 1986) made no explicit statement as to which theoretical framework the idea of motivation to transfer is based; although there are references to Bandura, Latham, and Vroom in their original papers, the associated motivation theories refer not to transfer motivation but to other aspects of the papers. Hence, motivation to transfer lacked from the start, and still lacks, a solid foundation in motivation theories In an attempt to provide a first step toward resolving this situation, we conducted two studies in which the theory of planned behavior (Gegenfurtner & Gruber, 2009) and expectancy and self-determination theory (Gegenfurtner, Festner, Gallenberger, Lehtinen, & Gruber, 2009) were tested as a basis for transfer motivation scales. In short, these studies indicate that motivation to transfer has several dimensions: autonomous motivation to transfer, controlled motivation to transfer, and intention to transfer. These are the first steps, and more efforts are needed to validate the construct's theoretical grounding for human resource development beyond.

On revisiting empirical evidence, it is a likely explanation that the one-dimensionality and the lack of theoretical grounding account for the current state of poor evidence on the intention-behavior relationship in training transfer. Correlation coefficients ranging from 0.04 (Tziner, Haccoun, & Kadish, 1991) to 0.63 (Machin & Fogarty, 1997) suggest that the relation between motivation to transfer and transfer of training needs further elaboration. Again, we believe that a starting point for this elaboration is a reconceptualization of Noe's model of transfer motivation. This may help to form new research practices with respect to the multidimensional nature of transfer motivation, its groundwork in valid motivation theories, and its measurement time.

On revisiting measurement time, our review of transfer motivation (Gegenfurtner et al., 2009b) indicated that, in 30 of 31 cases, the construct was assessed at the immediate end of training. Only Leitl and Zempel-Dohmen (2006) measured transfer motivation at the immediate end *and* at a later point in time, three months after the intervention. We believe that motivation to transfer in particular, like motivation for action in general, dynamically changes over time. Hence, assessment of transfer motivation at a time when the learner has had time to explore opportunities to use training in out-of-classroom applications may provide a very different picture than the assessment of transfer motivation at a time when the learner is just about to leave the classroom. Yet, empirical examinations at a different time than at the immediate end of training are almost non-existent.

On revisiting the social nature of motivation, there is large consensus that motivation is intrinsically social in nature (Hickey, Moore, & Pellegrino, 2001; Järvelä, Volet, & Järvenoja, 2010; Vauras, Salonen, & Kinnunen, 2008). We argue that this holds equally for transfer motivation. Especially when trainees spent some time at the workplace and could test the training content about its usefulness, social cues might affect formation and persistence of motivational states to transfer training. Arguably, the generation of more stable motivational traits is also influenced by factors such as social norms, feelings of relatedness, or control beliefs that are based on environmental (working) conditions emanated in social interaction. Noe (1986) constructed his model of transfer motivation at a time in which the social nature of motivation was not on the agenda yet. Reconceptualizing the Noe model can account for this development in motivation research.

Present Study

The present study had a dual goal. First, it aimed to test the multidimensionality of motivation to transfer. Multidimensionality was achieved by using a combined motivation theory approach. Specifically, there was a combination of a validated framework from educational psychology, self-determination theory (Baard, Deci, & Ryan, 2004), and a validated framework from management research, expectancy theory (Vroom, 2005), to conceptualize autonomous and controlled motivation to transfer. Expectancy theory as a cognitive-choice approach and self-determination theory as a need-motive-value approach can complement each other in predicting and explaining human performance in the workplace (Kanfer, 1990). Thus, instrumentality and valence items reflecting externally prompted reasons to transfer were used to assess controlled motivation. Conversely, instrumentality and valence items reflecting internally regulated behaviour were used to assess autonomous motivation. Autonomous motivation to transfer is defined here as an internalized desire to transfer learning that is initiated and governed by the self (i.e., regulated by identification or by integration with one's values), and controlled motivation as a desire to transfer learning that is not initiated and governed by the self (i.e., regulated by external rewards or sanctions). In addition to autonomous and controlled motivation as measures of motivational traits, intentions to transfer are also included as measures of motivational states. This is because contrary to motivational traits, intentions represent a more activated, situation-specific motivational state. We used Ajzen's (1991) theory of planned behaviour, a well-validated framework from social psychology, to conceptualize intentions to transfer.

The second goal was to test a hypothesized path model, shown in Figure 1. The model explored a motivational sequence. Effects of autonomous and controlled motivation on training transfer are mediated by the more situation-specific state of transfer intentions; at the same time, situational but distal social (relatedness, support, control, and norms) and affective (attitudes and utility reactions) cues on transfer intentions are

mediated by more stable motivational traits, i.e., autonomous and controlled motivation to transfer. It can be argued that motivational traits act like filters. For example, supervisory support may or may not lead to activated intentions, depending on the motivational trait. The model has a range of hypothesized relationships; these are based on theory or past empirical evidence. Specifically, the hypothesis, based on self-determination theory, predicted that relatedness (RE) at work would foster internalization of external regulations and would thus be positively related to autonomous motivation to transfer (Baard et al., 2004; Gegenfurtner et al., 2009a). Supervisory support (SU) was shown to have mixed empirical results on motivation, depending on whether support was perceived to be instrumental or not; we thus expected relations to both autonomous and controlled motivation. Based on the theory of planned behavior (Ajzen, 1991), it was hypothesized that perceived behavioral control (PBC) promoted trainees' feelings of autonomy and would thus be more important for autonomous motives; at the same time, social norms (NO) were hypothesized to have stronger effects for those trainees with controlled motivation. Past research showed that attitudes toward training content (AT) were related to both autonomous and controlled motivation (Gegenfurtner et al., 2009a). Utility reactions (UT) were hypothesized to affect self-determined feelings of autonomy; however, due to their instrumental nature, it was speculated that they could also affect controlled motivation.

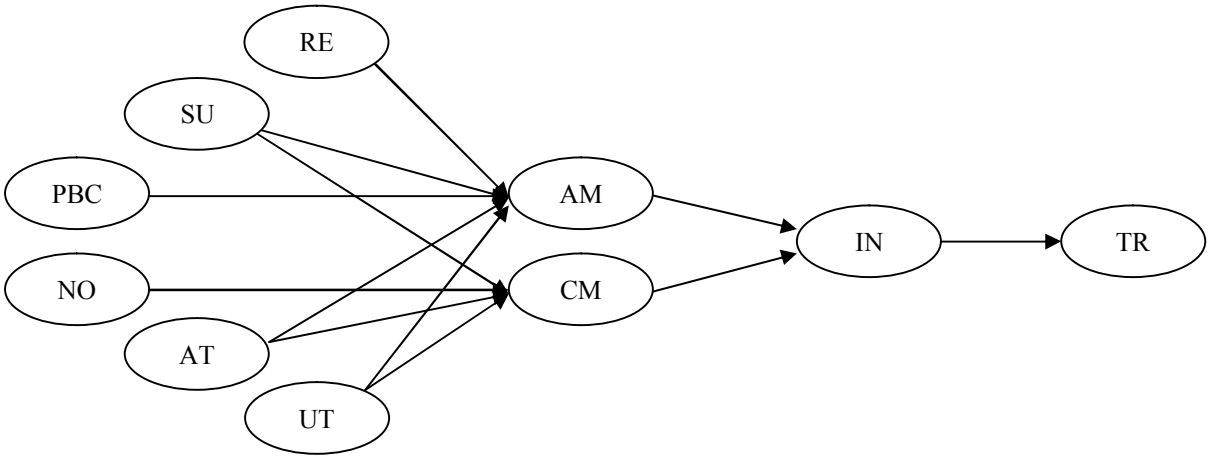

Figure 1. Hypothesized path model.

Method

Participants and Procedure

The participants in the study were 496 employees who attended one of the 23 training programs on occupational health and safety following German statutory accident insurance regulations. Three months after the training, trainees received a paper-and-pencil questionnaire sent to their workplace. The questionnaire collected self-report data that, despite the known problems (e.g., leniency, self-serving bias), seemed adequate to use because a major interest was trainees' self-perceived attitudinal and motivational states. One hundred thirty-one trainees (26.4%) completed and returned the questionnaire. Deletion of three multivariate outlying cases ultimately yielded a final sample size of 128 trainees. The majority of the participants was between 41 and 50 years old (43.1%) and has worked with their current employer for up to five years (25.0%); the average organization size was between 100 and 199 employees (68.8%). There was no statistically significant difference between respondents and non-respondents. Participation in the study was voluntary, with informed consent forms signed by the trainees. Anonymity and confidentiality were guaranteed for all responses.

Instruments

Unless otherwise indicated, a 5-point response scale was used for all items, with 1 = *strongly does not agree*, 2 = *does not agree*, 3 = *partly agrees*, 4 = *agrees*, and 5 = *strongly agrees*. All scales were pilot-tested; minor revisions in expressions and the ordering of items were reflected in the final version of the instrument. Table 1 presents internal consistency values of each scale.

Demographic and Organizational Membership Characteristics

Demographic and organizational membership characteristics were measured to establish nomological validity. One of each item was used to assess organizational tenure ('How long have you worked with your current employer?'; 1= up to 5 years, 2=6-10, 3=11-15, 4=16-20, 5=21 years or more), organization size ('How many people are employed in your company?'; 1=1-9 employees, 2=10-19, 3=20-49, 4=50-99, 5=100-199, 6=200-249, 7=250-349, 8=350-549, 9=550-999, 10=1000-1999, 11=2000 employees or more), and age (1=up to 30, 2=31-40, 3=41-50, 4=51-60, 5=more than 60 years old).

Independent Variables: Social and Affective Cues

This study used social and affective cues as independent variables. First, social cues were measured with scales on relatedness, supervisory support, perceived behavioral control, and social norms. To assess relatedness, five items were used based on the Basic Psychological Needs Scale at Work (Baard et al., 2004; Gegenfurtner et al., 2009a); the items measured the extent to which trainees felt connected and respected in their organizations (e.g., 'People at work care about me'). To assess supervisory support, five items were used that measured support associated with goal-setting and feedback (e.g., 'I try to achieve preset goals by applying what I have learned in training on the job'). To assess perceived behavioral control, we included five items that measured participants' perceived capability of and confidence in transferring the training to their workplace (e.g., 'I feel capable to apply the training content at work'). To assess social norms, five items were used that reflected the degree to which participants perceived social normative pressure from referents important to the trainees to perform or not to perform a certain behavior (e.g., 'My boss sets a high value on applying the training content at work').

Second, affective cues were measured with scales on utility reactions and attitudes toward training content. To assess utility reactions, items developed by Tai (2006) were used that measured the affective experience on whether the training has been useful during the last three months (e.g., 'Today, I judge the usefulness of the training as: 1=very low, 2=low, 3=average, 4=high, 5=very high'). To assess attitudes toward training content, five items were used to measure cognitive and emotional/affective aspects of attitudes towards occupational health and safety (Ajzen, 2001; Eagly & Chaiken, 1993; Gegenfurtner et al., 2009a). Sample items were as follows: for cognition, 'I easily come up with at least five reasons for complying with safety and health regulations', and for emotion, 'I feel responsible for health and safety in my working area'.

Mediating Variables: Motivation to Transfer

Motivation to transfer was measured with three distinct scales specifying autonomous motivation to transfer, controlled motivation to transfer, and intention to transfer (Gegenfurtner et al., 2009a; Gegenfurtner & Gruber, 2009). For autonomous motivation, two pairs of items were included to measure instrumentality and valence of autonomous motives for training transfer. Sample items were as follows: for instrumentality, 'While applying training at work, I can learn a lot', and for valence, 'This learning is important to me'. For controlled motivation, two pairs of items were included to measure instrumentality and valence of controlled motives for training transfer. Sample items were as follows: for instrumentality, 'Successful application of the training content will probably result in a materialistic reward, such as a financial bonus', and for valence, 'This reward is important to me'. A five-item scale was used to measure intention to transfer (e.g., 'I have tried intentionally to apply the training content to my workplace, regardless how well it actually worked').

Dependent Variable: Transfer of Training

To assess transfer of training, five items described in Festner and Gruber (2008) were used to measure self-perceived change in knowledge, skills, and attitudes toward the training content, occupational health and safety (e.g., 'Today, I engage more in health and safety than I did before the training').

Data Analyses

A two-stage procedure was adopted for data analysis. First, the factorial validity of the revisited construct of motivation to transfer was assessed. This was done using confirmatory factor analysis (CFA). Given an appropriate level of communality, CFA was considered meaningful (MacCallum, Widaman, Zhang, & Hong, 1999). Based on the EQS 6.1 (Bentler, 2005) software, three first-order CFA models designed to test the multidimensionality of the theoretical construct were examined. The first model was a three-factor model composed of autonomous motivation to transfer, controlled motivation to transfer, and intention to transfer. The second model was a two-factor model in which autonomous and controlled motivation were merged as if representing one factor. Finally, the third model was a one-factor model that forced autonomous motivation to transfer, controlled motivation to transfer, and intention to transfer into one factor (which is the current research practice). Data were screened to test for multivariate outliers, normality, and multi-collinearity (Kline, 2005). The direct maximum likelihood approach was used as a missing data specification procedure and robust methods as normality estimator corrections. Assessment of the model fit was based on four criteria reflecting statistical and theoretical considerations. The criteria were as follows: (1) the Yuan-Bentler scaled χ^2 test statistic, (2) the comparative fit index (CFI), (3) the standardized root-mean square residual (SRMR), and (4) the root-mean square error of approximation (RMSEA), with its 90% confidence interval (CI). This rationale was based upon literature recommendations (Bentler, 2005; Kline, 2005). For cut-off criteria, guidelines were followed for CFI>0.95, SRMR<0.09, and the RMSEA<0.06 (Hu & Bentler, 1999) to indicate appropriate goodness-of-fit. Validation of the three-dimensional construct seemed important to test the extent to which the measured variables actually represent the theoretical dimensions.

Once the factorial validity of motivation to transfer was established, its mediating position was assessed in our hypothesized model. This was done using path analysis following a partial least squares (PLS)

approach. Contrary to other estimation techniques like multiple regression or structural equation modeling, PLS can be applied to a non-normally distributed data set collected with a small sample (Chin & Newstead, 1999). Based on the SmartPLS 2.0 (Ringle, Wende, & Will, 2005) software, the relationships among the variables were assessed using the path weighting scheme algorithm. Importantly, PLS is an approach for predicting relationships in a model, not for assessing overall model fit. However, Table 1 reports three reliability indices to indicate appropriate psychometrics properties of the measurement models. For cutoff-criteria, guidelines were followed for Cronbach's alpha>0.70, the average variance extracted (AVE)>0.50, and the composite scale reliability (CSR)>0.60 (Hair, Black, Babin, Anderson, & Tatham, 2006). Mediation was analyzed following the recommendations by MacKinnon, Fairchild, and Fritz (2007).

Results

Screening of the data revealed no multicollinearity but multivariate nonnormality (Yuan, Lambert, and Fouladi's normalized estimate=45.88). Three multivariate outlying cases with a substantial different contribution to normalized multivariate kurtosis were subsequently deleted from all analyses. Table 1 presents psychometric properties and correlation coefficients of the measures. The next two sections describe test results for multidimensionality of motivation to transfer and for the hypothesized path model.

Table 1: Psychometric Properties and Correlation Coefficients of All Measures

	M	SD	α	AVE	CSR	1	2	3	4	5	6	7	8	9	10	11	12	13
Age	2.67	0.88	-	-	-	-	.12	.02	.03	.06	.03	.02	.01	.02	.06	.02	.01	.05
OT	5.45	2.97	-	-	-	.34	-	.01	.08	.02	.03	.01	.08	.01	.05	.01	.06	.01
OS	2.71	1.39	-	-	-	.04	.11	-	.03	.04	.03	.02	.01	.01	.01	.01	.01	.05
RE	4.03	.79	.84	.60	.88	.18	.09	.18	-	.27	.34	.35	.26	.18	.13	.10	.19	.04
SU	3.69	.97	.71	.69	.76	.08	.04	.06	.52	-	.25	.42	.32	.34	.30	.34	.34	.19
PBC	4.10	1.01	.84	.78	.82	.17	.05	.16	.58	.59	-	.41	.41	.41	.31	.20	.40	.09
NO	2.41	1.23	.90	.71	.93	.15	.11	.13	.59	.65	.64	-	.32	.36	.24	.32	.20	.10
AT	3.60	.85	.73	.68	.82	.12	.09	.11	.51	.57	.64	.57	-	.31	.32	.20	.35	.17
UT	4.14	.75	.82	.64	.88	.14	.11	.12	.42	.58	.64	.60	.56	-	.40	.28	.38	.36
AM	4.12	.84	.83	.66	.88	.08	.07	.10	.36	.55	.56	.49	.57	.63	-	.35	.37	.40
CM	2.68	1.16	.74	.66	.77	-.04	.11	-.11	.31	.58	.45	.56	.45	.53	.59	-	.19	.18
IN	4.02	.95	.73	.68	.82	.11	.08	.12	.44	.58	.63	.46	.59	.62	.61	.44	-	.23
TR	3.82	1.02	.87	.76	.91	-.10	.12	-.22	.19	.44	.30	.31	.41	.60	.63	.43	.48	-

Note. Values below the diagonal are correlation estimates. Values above the diagonal are squared correlation estimates. OT=organizational tenure, OS=organization size, RE=relatedness, SU=supervisory support, PBC=perceived behavioral control, NO=social norms, AT=attitudes toward training content, UT=utility reactions, AM=autonomous motivation to transfer, CM=controlled motivation to transfer, IN=intention to transfer, TR=transfer of training $p<.05$ for $r>14$.

Testing for Multidimensionality

The model to be tested a priori postulates that motivation to transfer three months after training is a three-factorial structure composed of autonomous motivation to transfer, controlled motivation to transfer, and intention to transfer. The three-factor model was tested first; then it was compared to the two-factor model and the one-factor model. Fit statistics relative to these models are presented in Table 2. In reviewing the CFI, SRMR, RMSEA, and $\chi 2$ test statistic values in Table 2, it is evident that the hypothesized three-factor model represented the best fit to the data.

Table 2: Confirmatory Factor Analytic Model Fit Statistics.

Model	χ^2	*df*	CFI	SRMR	RMSEA (with 95% confidence interval)
Three-factor model	112.24	62	.97	.08	.05 (.04 - .08)
Two-factor model	148.45	64	.85	.10	.09 (.07 - .12)
One-factor model	176.59	65	.76	.10	.11 (.09 - .13)

After CFA, construct validity of the three-factor solution was tested by assessing convergent, discriminant, nomological, and face validity. We followed the guidelines from Hair et al. (2006). First, concerning convergent validity, the variance-extracted measures (AVE) of AM, CM, and IN exceeded the 50% level, and the reliability estimates were larger than .70. Although two factor loadings were below .50, they did not appear to significantly harm the model fit or internal consistency; hence, convergent validity was established. Second, a construct is divergently valid if the variance-extracted estimates for each factor are larger than the squared inter-construct

correlations associated with this factor (Hair et al., 2006). Table 1 reports AVE and squared intercorrelations. All variance-extracted estimates are larger than the corresponding squared intercorrelation estimates; hence, divergent validity of AM, CM, and IN was established. Third, concerning nomological validity, Hair and colleagues (2006) recommend comparing the constructs to other variables not included in the model, which, in this study, were demographic and organizational membership characteristics. The three factors were not significantly affected by trainee age, organizational tenure, or organization size; hence, nomological validity was established. Finally, face validity of the three dimensions was established based on discussions among the authors AG and DF about the content of the corresponding items. In summary, both the established construct validity and the acceptable model fit indicated good conditions to further test the hypothesized relationships of the three-factor solution in the PLS path model.

Testing the Hypothesized Path Model

Table 3 presents the parameter estimates of the hypothesized path model. Mediation analysis (MacKinnon et al., 2007) indicates that intention to transfer mediated the effect of autonomous motivation on training transfer; autonomous motivation had a stronger effect on intentions than controlled motivation. Supervisory support, social norms, and utility reactions significantly affected controlled motivation while attitudes toward training content and utility reactions affected autonomous motivation. It is interesting to note that supervisory support seems to be effective for controlled motivation, but not for autonomous motivation. Despite the hypotheses, the paths from relatedness, support, and perceived behavioral control to autonomous motivation were non-significant, as was the path from controlled motivation to transfer to intention to transfer. This indicates that autonomous motives lead to more activated intentions than controlled motives three months after training.

Table 3: Confirmatory Factor Analytic Model Fit Statistics.

Effect of	On	Path coefficient	*t*-value
Relatedness	Autonomous motivation	-.04	0.06
Supervisory support	Autonomous motivation	.12	1.31
Supervisory support	Controlled motivation	.29	3.04*
Perceived behavioral control	Autonomous motivation	.01	0.02
Social norms	Controlled motivation	.24	2.11*
Attitudes toward training content	Autonomous motivation	.22	2.64*
Attitudes toward training content	Controlled motivation	.04	0.35
Utility reactions	Autonomous motivation	.55	7.07*
Utility reactions	Controlled motivation	.21	2.27*
Autonomous motivation	Intention to transfer	.54	6.08*
Controlled motivation	Intention to transfer	.12	1.39
Intention to transfer	Transfer of training	.48	6.39*

Note. * $t > 1.96 = p < .05$

Discussion and Conclusion

The theme of ICLS2010 invited an exploration of disciplinary perspectives and how multidisciplinary approaches can advance the learning sciences. This study explored research practices in the HRD and management disciplines with respect to motivation and transfer. Revisiting the Noe model, it was argued that the construct 'motivation to transfer' needs to be reconceptualized in several significant respects before learning researchers should follow Pugh's and Bergin's (2006) recommendation to adopt motivation to transfer in contexts beyond HRD. This study used a multidisciplinary account in that it lied on the confluence of several literatures. The first is composed of managerial studies on the application of training to the workplace, including motivational processes as their central mediator. The second is composed of theoretical accounts on task and achievement motivation prominent in educational and social psychology. This confluence creates an interesting tension. It is obvious in reading the present study that 'transfer' is used in line with what Bransford and Schwartz (1999) have called the Direct Application theory of transfer. Certainly, there are other perspectives on transfer prevalent in other disciplines such as vocational education (Tuomi-Gröhn & Engeström, 2003), mathematics education (Lehtinen & Hannula, 2006), or computer-supported collaborative learning (Kapur & Kinzer, 2009). Many more could be named. The emphasis of the immediate use of what was learned in workplace applications is likely to be a result of the focus on the short-term benefits of training that can be found in many management and HRD contexts. In line with this view, motivation was seen as a single factor that can facilitate quick training application. We have criticized this view in the present study as being too coarse to account for the full complexity of intentional transfer processes. It seemed to us that a way to overcome this problem was to use the best of both disciplines—HRD and learning sciences—to create a new

account on motivation to transfer. Future research will have to show whether the proposed three-dimensional model is more successful in predicting transfer than a one-dimensional model.

This study revisited Noe's (1986) construct motivation to transfer. In a series of CFA analyses it was shown that motivation to transfer has a three-factor structure consisting of autonomous motivation to transfer, controlled motivation to transfer, and intentions to transfer. This factor structure was built on a combined motivation theory approach unifying self-determination theory (educational psychology), expectancy theory (management), and the theory of planned behavior (social psychology). In a PLS-modeled path analysis, the study showed that social cues influenced controlled motivation, but not autonomous motivation; affective cues had an impact on both autonomous and controlled motivation. Intentions to transfer mediated the effect of autonomous motivation on training transfer. Compared to past transfer motivation research, this study tested several new directions that have theoretical implications. First, the motivational sequence explored indicates that intentional transfer processes cannot be captured with a single scale; rather motivational states and traits associated with social and affective cues can form an interdependent account of learner and environment (Hickey et al., 2001; Järvelä et al., 2009) This interdependency regulates motivation and has a differentiated effect on motivation and intention (Vauras et al., 2008). Second, the measurement time three months after training can be seen as a significant step toward developing an understanding of how motivation to transfer is affected when the learner interacts within her/his routine work environment, not affected by the training condition. More research in the temporal dimension of transfer motivation is needed, however, to overcome what was termed the dynamic problem of motivation to transfer (Gegenfurtner et al., 2009b). There are three limitations. First, the data consisted of self-report measures only. This was deemed appropriate for this study because the interest was in the trainees' subjective attitudinal, motivational, and intentional perceptions. However, we are aware of problems associated with leniency and self-serving bias that can likely occur in self-reported material. Second, study implications are constrained by characteristics of the population of trainees in occupational health education from which the sample was drawn. Third, generalization of the findings is limited to the time period three months after training. Since motivation to transfer is assumed to be a dynamic construct, all relationships explored must be considered with caution when generalizing to a different time frame.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.

Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology, 34*, 2045-2068.

Bentler, P. M. (2005). *EQS 6 structural equations program manual* Encino, CA: Multivariate Software.

Bransford, J. D., & Schwartz, D. L. (1999). Rethinking transfer: A simple proposal with multiple implications. *Review of research on education, 24*, 61-100.

Burke, L. A., & Hutchins, H. M. (2007). Training transfer: An integrative literature review *Human Resource Development Review, 6*, 263-296.

Chin, W., & Newstead, P. (1999). Structural equation modeling analysis with small samples using partial least squares. In R. Hoyle (Ed.), *Statistical strategies for small sample research* (pp. 307-341). Thousand Oaks, CA: Sage.

Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, TX: Harcourt.

Festner, D. & Gruber, H. (2008). Conditions of work environments in fostering transfer of training. In S. Billett, C. Harteis, & A. Eteläpelto (Eds.), *Emerging perspectives of workplace learning* (pp. 215-231). Rotterdam: Sense.

Gegenfurtner, A., Festner, D., Gallenberger, W., Lehtinen, E., & Gruber, H. (2009). Predicting autonomous and controlled motivation to transfer training. *International Journal of Training and Development, 13*, 124-138.

Gegenfurtner, A., & Gruber, H. (2009, August). *Do intentions mediate the transfer process? Testing the theory of planned behaviour*. Paper presented at the 13th Conference of the European Association for Research on Learning and Instruction, Amsterdam.

Gegenfurtner, A., Veermans, K., Festner, D., & Gruber, H. (2009). Motivation to transfer training: An integrative literature review. *Human Resource Development Review, 8*, 403-423.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). Upper Saddle River, NJ: Prentice Hall.

Hickey, D. T., Moore, A. L., & Pellegrino, J. W. (2001). The motivational and academic consequences of elementary mathematics environments: Do constructivist innovations and reforms make a difference? *American Educational Research Journal, 38*, 611-652

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.

Järvelä, S., Volet, S., & Järvenoja, H. (2010). Research on motivation in collaborative learning: Moving beyond the cognitive-situative divide and combining individual and social processes. *Educational Psychologist, 45*, 15-27.

Kanfer, R. (1990). Motivation theory and industrial and organizational psychology. In M. D. Dunnette & L. Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol. 1, pp. 75-170). Palo Alto, CA: Consulting Psychologists Press.

Kapur, M., & Kinzer, C. K. (2009). Productive failure in CSCL groups. *International Journal of Computer-Supported collaborative learning*, 4, 21-46.

Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: Guilford.

Lehtinen, E., & Hannula, M. M. (2006). Attentional processes, abstraction, and transfer in early mathematical development. In L. Verschaffel, F. Dochy, M. Boekaerts, & S. Vosniadou (Eds.), *Instructional psychology: Past, present and future trends. Fifteen essays in honour of Erik De Corte* (pp. 39-54). Oxford: Elsevier.

Leitl, J., & Zempel-Dohmen, J. (2006). Die Bedeutung des Arbeitsumfelds für die Veränderung der Transfermotivation. [The impact of work environment on the changing level of motivation to transfer] *Zeitschrift für Arbeits- und Organisationspsychologie, 50*, 92-102.

MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods, 4*, 84-99.

Machin, M. A., & Fogarty, G. J. (1997). The effects of self-efficacy, motivation to transfer, and situational constraints on transfer intentions and transfer of training. *Performance Improvement Quarterly, 10*, 98-115.

MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology, 58*, 593-614.

Noe, R. A. (1986). Trainees' attributes and attitudes: Neglected influences on training effectiveness. *Academy of Management Review, 11*, 736-749.

Noe, R. A., & Schmitt, N. (1986). The influence of trainee attitudes on training effectiveness: Test of a model. *Personnel Psychology, 39*, 497-523.

Pugh, K. J., & Bergin, D. A. (2006). Motivational influences on transfer. *Educational Psychologist*, 41, 147-160.

Ringle, C. M., Wende, S., & Will, A. (2005). *SmartPLS 2.0*. Available at http://www.smartpls.de.

Tai, W.-T. (2006). Effects of training framing, general self-efficacy and training motivation on trainees' training effectiveness. *Personnel Review, 35*, 51-65.

Tuomi, Gröhn, T., & Engesröm, Y. (2003). Conceptualizing transfer: From standard notions to developmental perspectives. In T. Tuomi-Gröhn & Y. Engeström (Eds.), *Between school and work. New perspectives on transfer and boundary-crossing* (pp. 19-38). Oxford: Elsevier.

Tziner, A., Haccoun, R. R., & Kadish, A. (1991). Personal and situational characteristics of transfer of training improvement strategies. *Journal of Occupational Psychology, 64*, 167-177.

Vauras, M., Salonen, P. & Kinnunen, R. (2008). Influences of group processes and interpersonal regulation on motivation, affect and achievement. In M. Maehr, S. Karabenick, & T. Urdan (Eds.) *Social psychological perspectives. Advances in motivation and achievement* (Vol. 15, pp. 275-314). New York: Emerald.

Velada, R., Caetano, A., Bates, R., & Holton, E. (2009). Learning transfer– validation of the learning transfer system inventory in Portugal. *Journal of European Industrial Training, 33*, 635-656.

Vroom, V. H. (2005). On the origins of expectancy theory. In K. Smith & M. Hitt (Eds.), *Great minds in management: The process of theory development* (pp. 239-258). Oxford: Oxford University Press.