EÖTVÖS LORÁND UNIVERSITY

FACULTY OF EDUCATION AND PSYCHOLOGY

Theses of the Doctoral Dissertation

János Salamon

THE ROLE OF CONTEXTUAL AND INDIVIDUAL FACTORS IN THE TRANSFER OF SOFT SKILL DEVELOPMENT TRAINING PROGRAMS

Doctoral School of Psychology

Head of the School: Róbert Urbán, DSc, professor, Eötvös Loránd University

Behavioral Psychology Program

Head of the Program: Anna Veres-Székely, DSc, professor, Eötvös Loránd University

Supervisors:

Tamás Nagy, PhD, assistant professor, Eötvös Loránd University

Gábor Orosz, PhD, researcher, Université d'Artois

Budapest, 2022

I. INTRODUCTION

Survival and profitability of organizations are partly based on how well their employees accomplish their current tasks and are able to adapt to future challenges. Consequently, employees and managers are often required to train themselves and develop additional skills to ensure their employability, and to maintain the competitive advantage of the organization (Noe & Tews, 2012; Reio, 2020). Traditionally learning at work was associated with formal training (Ford, 2020). The formal way to develop additional skills by providing corporate training programs is still an often-favored approach by the organizations. The importance of these formal training programs in the business world can be illustrated by the size of investment organizations dedicate to these programs every year. For example, organizations spent on formal training programs approximately $164.2 billion in 2012, in the US only (Miller et al., 2013). These programs can either target upskilling (i.e., improving existing knowledge and skills to ensure excellence in the current job function) or reskilling (i.e., gaining new knowledge and skills to accomplish new jobs successfully) the workforce (Ford, 2020).

Regardless of their targeted skills, organizations need to ensure that the significant amount of dedicated resources to workforce training and development lead to individual and organizational benefits. For ensuring these benefits, it is essential for participants to use the training-acquired knowledge, skills, and attitudes on the job — also known as training transfer (Baldwin & Ford, 1988; Burke & Hutchins, 2007; Ford et al., 2018). Without training transfer the potential benefits may not manifest and dedicated resources may be spent in vain. Training transfer scholars assumed that the extent of training transfer is generally low (e.g., Saks, 2002), and there is a significant potential for having a better return on the enormous investment organizations spend on employee training and education (Ford et al., 2018).

Although the training transfer literature has already identified some of the key factors of successful training transfer (c.f. Ford et al., 2018; Kraiger & Ford, 2021), there is still a need to investigate questions that are one step beyond the well-established predictor-outcome relationships and support our understanding in whether and how these factors and relationships can be influenced (Ford et al., 2018). Therefore, the aim of the present dissertation was to contribute to the understanding of these deeper layers of the training transfer field by applying an interactionist perspective and investigating the influence and interactions of certain individual and contextual factors. The present multi-study investigation built upon several theoretical frameworks – including the Job Demands-Resources Theory (Bakker & Demerouti, 2017), the Conservation of Resources Theory (Hobfoll, 1989), the Social Information Processing Theory (Salancik & Pfeffer, 1978), the Social Cognitive Theory (Bandura, 1986), and the Self-Determination Theory (Deci & Ryan, 2000; Ryan & Deci, 2000, 2017)– that could provide a solid background for the examined relationships.

The structure of the present dissertation is the following: the next chapter presents a detailed overview of the main elements of training transfer, including those variables that were continuously identified as essential factors in the successful transfer process. The overview of the training transfer literature is closed by the introduction of the Dynamic Transfer Model (Blume et al., 2019), which utilizes the dynamic interactionist perspective, describes the training transfer process, and highlights the key linkages between the previously identified elements. The following chapters present the four empirical studies of the present dissertation. Finally, the dissertation is closed by a general discussion of the findings and their potential implications related to future studies and practical applications.

II. OVERVIEW OF THE TRAINING TRANSFER LITERATURE

II/1. TRANSFER OF TRAINING

In the first comprehensive review of the empirical research on training transfer, Baldwin and Ford (1988) provided an organizing framework to categorize factors affecting the transfer process. This framework differentiates between the training-input factors, training outcomes and the conditions of transfer. One of the conditions of transfer, *generalization* refers to the transfer of the learned skills into the performance environment with a modification to a necessary extent required by the difference in settings, situations and people involved (Ford et al., 2018). *Maintenance* –the other transfer condition– refers to the extent of knowledge, skills, behavior, or attitude retention after the completion of training. The maintenance of the learning outcomes can be unbalanced. Likely, not all participants can equally find opportunities and adapt/generalize all the learned skills in their work environment, which results in successful application and retention of some parts of the acquired skills, and results in the deterioration of others (Ford, 2020).

Although the positive change in knowledge, skills, and attitudes are important indicators of a successful training program on the individual level, organizational investments are ultimately aimed to improve individual, team, and organizational effectiveness through learning. Consequently, the third important aspect of transfer refers to the *performance improvement* that results from the application of the acquired skills (Ford, 2020). Furthermore, beyond the direct application of acquired knowledge, skills, and attitudes (also known as *transfer-as-use*), qualitative and quantitative studies suggest that there are other ways of transfer that could be considered when investigating the success of training (i.e., *evaluation*, *explanation*, *instruction*, and *leading* the transfer of training; Ford et al., 2019; Yelon et al., 2014).

II/2. TRAINING OUTCOMES

The second main part of the transfer model is the training outcomes (or learning outcomes) that were proposed as mediating variables between predictive factors (e.g., trainee, training design, and work environment) and the transfer of training (Baldwin & Ford, 1988; Noe, 1986; Tannenbaum et al., 1991). The relatedness of learning outcomes and the transfer of training implies that learning the materials covered in training is a crucial prerequisite of transfer. Kraiger et al. (1993) suggested considering learning outcomes as a multidimensional construct, which covers both cognitive, affective, and skill-based learning outcomes. As noted by Huang et al. (2015), in training research, declarative knowledge is usually assessed as *cognitive outcome*, post-training self-efficacy and motivation to transfer as *affective outcomes*, while skill acquisition and reproduction are usually assessed as *skill-based outcomes*.

Regarding *training content*, training programs are generally categorized into two main training types. One of them is called *closed/hard skill training* (e.g., technical skills, working with tools, equipment, software). These programs target specific skills that are trained in nearly identical settings than the on-the-job performance environment. Another type of training programs –in which the difference between learning context and real-life situations are larger– is labelled *open/soft skill training*, which aims to improve intrapersonal and interpersonal skills (Laker & Powell, 2011; Yelon & Ford, 1999). Laker and Powell (2011) compared these two training types and identified ten aspects in which they differ and may affect their transfer success. For example, these aspects include similarity between the learning context and the performance environment, complexity and variety of transfer situations, precision of training needs' identification, applied methods of instructions, individual and social resistance to change, the measurement of application, and the nature of the barriers of application.

II/3. TRAINING DESIGN CHARACTERISTICS AND LEARNING PRINCIPLES

The third main part of the transfer model contains the training-input factors which also differentiates three main categories, including training design characteristics, trainee characteristics, and work-environment characteristics. Many empirical studies investigated these training-input factors. The overview in the present dissertation included only those factors which importance in the transfer success received ample empirical support according to previous reviews, and meta-analyses.

The first main pillar of the training-input factors, training design characteristics has four main subcategories. The first refers to the preparation phase, in which a proper *needs assessment* is required. It can ensure that the training program targets (1) those individuals who needs the training the most, and (2) those specific knowledge, skill, or attitude gaps that lead to the necessary performance (Arthur et al., 2003; Ford, 2020). The second subcategory of training design characteristics covers the learning principles that support knowledge acquisition. These include the *preparation of learners* by building commitment for learning (Hughes et al., 2018; Salas et al., 2012), *generative learning* which involves learners to actively make connections between new information and their existing knowledge, *interleaved practice* where different situations or materials are mixed within a learning module (Dunlosky et al., 2013), and *retrieving information* that utilizes the impact of the testing effect (e.g., Roediger & Butler, 2011).

The following training design category include learning principles that support the application of learning. For example, providing a variability of *practice opportunity* (across tasks, people, and situations) was found as an important instructional principle (Kraiger & Ford, 2021). Evidence also shows that *overlearning* –continuing practice even after reaching a level of mastery– leads to strong retention results and serve as a basis of automaticity (Burke & Hutchins, 2007; Ford, 2020; Kraiger & Ford, 2021). Research provided evidence for the positive impact of having *identical elements* in the learning and transfer environments (van der Locht et al., 2013). The *distribution of practice over time* or *spaced practice* (i.e., providing multiple training sessions separated by time) was also found as beneficial on long-term retention and successful transfer (Ford et al., 2018; Lacerenza et al., 2017). Furthermore, previous research shows the advantages of integrating *adaptive difficulty* (where difficulty is adjusted to each learners' individual performance; Wickens et al., 2013), *scaffolding* (aiding learners in the early phases and incrementally reducing support over time; Plott et al., 2014) and timely and specific *feedback* about their transfer attempts (Kraiger & Ford, 2021; Lacerenza et al., 2017).

The last category related to training design characteristics is including the evidence-based training methods. One of them is called *error management* training. This training method is intentionally incorporating errors in the program (e.g., facilitating exploration, encouraging trainees to make errors during training and learn from them; Keith & Frese, 2008). The other specific training method that received special research attention and support is called *behavior modeling* training, which integrates multiple learning principles that were found to be effective in increasing transfer success (Taylor et al., 2005).

II/4. INDIVIDUAL CHARACTERISTICS

The success of transfer is not solely dependent on training methods, design characteristics, and delivery methods, but the learners' individual characteristics also play an important role in it (Baldwin & Ford, 1988). Prior studies investigated the role of several individual characteristics, but only a few showed positive relationships with transfer consistently. These factors include

cognitive ability, mastery orientation, motivation to learn and self-efficacy (Blume et al., 2010; Ford et al., 2018).

In their meta-analysis, Blume et al. (2010) found supportive evidence for the positive relationship between *cognitive ability* and transfer. However, their moderator analysis revealed that the positive relationship is present only in the case of closed/hard skill training. On the contrary, *self-efficacy* – another important predictor of training transfer – was found to be specific for open/soft skill training transfer, and not for the transfer of closed/hard skills (Blume et al., 2010). Motivation is found to be essential in performing a behavior, and its prominent role was underlined in numerous theories and models of behavior change (cf., Michie et al., 2014). The training transfer literature also identified several aspects of motivation as important in the transfer process. These include *mastery orientation* (i.e., focusing on learning, seeking challenges, and prioritizing competency development and mastery task instead of trying to avoid mistakes and focusing only on performance; Dweck, 1986), *motivation to learn* (Blume et al., 2010; Ford et al., 2018; Gegenfurtner, 2011), and *motivation to transfer* learned skills to the job (e.g., Axtell et al., 1997; Baldwin & Ford, 1988; Gegenfurtner et al., 2009).

II/5. WORK-ENVIRONMENT CHARACTERISTICS

The third pillar of the training-input factors influencing training transfer is related to the work environment where the learners achieve their daily duties, and where learned skills are expected to be transferred. Work environment consists of both physical and social environmental characteristics that provide enablers and/or barriers to accomplish the targeted behavior. The three main environmental characteristics that received ample empirical support are the transfer climate, opportunity to transfer, and social support participants receive from their environment (Blume et al., 2010; Burke & Hutchins, 2007; Ford et al., 2018).

Transfer climate is a broad concept that includes situational cues and consequences that can facilitate or inhibit training transfer by signaling to participants what is accepted, supported and important for the organization (Rouiller & Goldstein, 1993). Among the transfer climate factors, the specific environmental factor of *opportunity to use* the learned skills on the job was consistently found as a strong predictor of training transfer (Baldwin & Ford, 1988; Burke & Hutchins, 2007; Ford et al., 2018). Similarly, the role of *social support* also received a special research interest and its positive impact on training transfer gained ample empirical support (Burke & Hutchins, 2007; Ford et al., 2018). According to the meta-analysis of Hughes et al. (2020), support can account for 32% of the variance in transfer, and three support providers (i.e., organization, supervisor, and peers) have their unique contributions to training transfer.

II/6. DYNAMIC TRANSFER MODEL

The puzzle pieces of the identified important transfer elements are integrated into a comprehensive, Dynamic Transfer Model by Blume et al. (2019). The model depicts training transfer as a dynamic process and describes the linkages between the specific elements. The first part of the Dynamic Transfer Model (Blume et al., 2019) represents a simplified training process, including the pretraining and post-training knowledge, skills, and attitudes of training participants that may influence their necessary work behavior. The next phases represent the dynamic, iterative part of the model. For the description of this phase, Blume et al. (2019) apply the dynamic interactionist perspective (in which behavior is seen as an outcome of the individual's continuous, reciprocal interaction with their environment; Reynolds et al., 2010). According to Blume et al. (2019), at the second phase (1) individuals who are motivated to transfer training (2) make their

first transfer attempt, (3) evaluate it and integrate the feedback from this experience. This initial transfer attempt either increases transfer motivation and facilitates further transfer attempts or decreases motivation which may result in the lack of other transfer attempts. The model emphasizes the importance of the individuals' early experiences on transfer, the adjustment of transfer outcomes over time, and it also highlights the mutual interaction between the individuals and their physical and social environment.

According to this approach, the mechanism of training transfer can only be understood by investigating the interplay between relevant individual and situational characteristics (Blume et al., 2019). The cross-sectional nature of the studies in the present dissertation did not allow us to fully utilize the iterative, dynamic interactionist perspective in the examination of training transfer. However, these studies utilized this approach by investigating the interplay between relevant individual and situational characteristics in soft skill training programs.

II/7. AIMS AND RESEARCH QUESTIONS

The overarching aim of the studies in the present dissertation is to unfold the reasons for some previously controversial findings and to investigate previously neglected contextual aspects that can potentially impact the transfer process. To support this endeavor most of the studies in the present dissertation utilize diverse samples of soft skill training programs delivered in multiple Hungarian companies. These carefully selected samples allowed us to investigate specific aspects that are not possible to investigate in research programs focusing only on one type of program in one organization.

Previous studies provided controversial findings about how the attendance policy impacts the transfer success (Gegenfurtner et al., 2016). While some suggested that mandatory participation leads to better training outcomes (e.g., Baldwin & Magjuka, 1991; Machin & Treloar, 2004; Salas et al., 2012) other researchers provided evidence that voluntary participation results in increased transfer outcomes (e.g., Baldwin et al., 1991; Curado et al., 2015; Mathieu et al., 1992). To unfold the underlying mechanism and investigate the interaction between the attendance policy and the effect of supervisor support on transfer motivation and transfer, it was proposed in *Study 1* to apply a more dynamic participation approach, utilizing self-determination theory (Deci & Ryan, 2012; Rosen et al., 2014).

Study 2 focused on another contextual factor which may be relatively easy for organizations to implement, but its effect on the transfer process has largely been overlooked. The positive effect of peer support on training transfer is supported by several previous studies (Ford et al., 2018; Hughes et al., 2020). However, the effect of how many coworkers participate in the training and acquire the same knowledge, skills, and attitudes remained to unfold to date. Therefore, the aim of *Study 2* was to investigate the effect of coworker training participation and its interaction with peer support on transfer motivation and transfer.

The subsequent studies aimed to provide information about how training participants' perceptions about their work environment and their work engagement can influence the transfer process. Achieving this aim could improve our understanding of how participants' transfer motivation and opportunity seeking/perception could be improved. Therefore, *Study 3* aimed to validate the Hungarian version of the Utrecht Work Engagement Scale and investigate the factor structure of work engagement in two Hungarian samples. Finally, *Study 4* aimed to investigate the training participants' perceptions about their work environment, and its influence on training outcomes through their transfer motivation, general work engagement and the opportunities they create/perceive to practice and apply trained skills on the job.

III. THE INTERPLAY BETWEEN THE LEVEL OF VOLUNTARY PARTICIPATION AND SUPERVISOR SUPPORT ON TRAINEE MOTIVATION AND TRANSFER (STUDY 1)[1]

III/1. AIMS

Previous studies provided controversial findings about how the attendance policy impacts the transfer process (Gegenfurtner et al., 2016). The present study proposes the application of the concept of the level of voluntary participation when considering the effect of the attendance policy. The application of this more dynamic participation approach provides an opportunity to investigate the impact of attendance policy from a different angle. The study aims to provide an explanation for the previously controversial findings by investigating the interplay between the level of voluntary participation and supervisor support on transfer motivation and training transfer.

III/2. MATERIALS AND METHODS

III/2.1. Participants and Procedure

An invitation to participate in the study was sent to employees of research partner companies who had attended a training program in the prior six months. Participation in an online survey was encouraged by a lottery drawing that awarded a total of 50 small prizes worth about $15. The final sample included those who participated in a company-organized, soft-skill training program with at least one classroom session and who responded to the survey between 13-120 days after training. The final sample consisted of 311 working adults (48% female) who were between 22 and 64 years old (M = 39.2, SD = 9.28). Participants worked at different organizational levels (54% non-managers; 46% managers) at eight mid- to large-size Hungarian companies.

III/2.2. Measures

Motivation to Transfer. Based on the work of Noe and Schmitt (1986), Warr et al. (1999), and Nijman and Gelissen (2011), a three-item scale was developed to measure training participants' post-training transfer motivation ($\alpha = .91$). Responses were provided on a seven-point Likert-scale (from 1 = *Not true at all* to 7 = *Completely true*).

Perceived Training Transfer. A four-item scale based on the work of Tesluk et al. (1995) was used to assess the perceived application of learned techniques on the job. Items were modified to reflect a general, topic-independent behavior applied on the job ($\alpha = .95$.). Responses were provided on a seven-point Likert-scale (from 1 = *Not true at all* to 7 = *Completely true*).

Supervisor Support. A three-item scale was developed to measure supervisor support with items phrased using general terms ($\alpha = .87$). Each item was scored on a seven-point Likert-scale (from 1 = *Not true at all* to 7 = *Completely true*).

Level of Voluntary Participation. Respondents indicated the extent of their voluntary participation on a three-level scale: "My manager instructed me to do so (i.e., it was mandatory)" was classified as low level, "My manager instructed me to do so but I also wanted to participate" was classified as moderate or mixed, while "I wanted to participate (i.e., out of my own interest)" was classified as a high level of voluntary participation.

[1] Salamon, J., Blume, B. D., Orosz, G., & Nagy, T. (2021). The interplay between the level of voluntary participation and supervisor support. *Human Resource Development Quarterly, 32*(4), 459-481. https://doi.org/10.1002/hrdq.21428

Training program length. A four-level scale was used to measure the training program length. Levels of the scale included: (1) less than half day, (2) approximately one day, (3) more than one day, but maximum of two days, (4) more than two days.

Materials Before/After Classroom Training Session. Respondents indicated whether or not they received any additional materials before the classroom training session, as well as whether they received any additional materials after the classroom training session.

Time lag. We controlled for time lag by measuring the number of days between the end of the last training session and the response date on the survey.

Manager. Respondents indicated their positions in the survey. We classified these as either manager-level (including both lower and upper-level managers) or non-manager (including both blue- and white-collar workers).

Company. Companies were also included in the statistical models as control variables since different company cultures and procedures may influence other measured variables or relationships (Garavan et al., 2020).

III/2.3. Statistical Analysis

Statistical analyses were performed with R 4.0.2 (R Core Team, 2020), using *tidyverse* 1.3.0. (Wickham et al., 2019) for data transformation, and *estimatr* 0.22.0. (Blair et al., 2020) for calculating heteroscedasticity-consistent standard errors.

Scales were calculated by taking the mean of the items. As a preparation for the linear regression analyses, ordinal and continuous independent variables were standardized to eliminate potential multicollinearity problems. Using these variables in the models, variance inflation factor (VIF) values (ranging between 1.07 and 3.55) indicated no problem with multicollinearity as they were below the stricter threshold of 5 (Hair et al., 2018). The normal distribution of the residuals was verified by skewness and kurtosis indices. The Breusch-Pagan test (Breusch & Pagan, 1980) and the Non-constant Variance Score Test (Fox & Weisberg, 2011) showed that the assumption of homoscedasticity was violated in the case of some models, thus following the recommendation of Long and Ervin (2000), parameter estimates were calculated using heteroscedasticity-consistent standard errors (HC3). Model fits were compared by the adjusted R^2, Akaike Information Criterion (AIC), and the Bayesian Information Criterion (BIC).

Hierarchical linear regression analyses were conducted to investigate the association of the independent variables with motivation to transfer and perceived training transfer as dependent variables. For both dependent variables, the basic model (Model 1) contains the companies, where the company with the highest number of respondents was defined as the reference. The second model (Model 2) adds in the training-related control variables, whereas the third model (Model 3) adds the level of voluntary participation, supervisor support, and the interaction of these two variables.

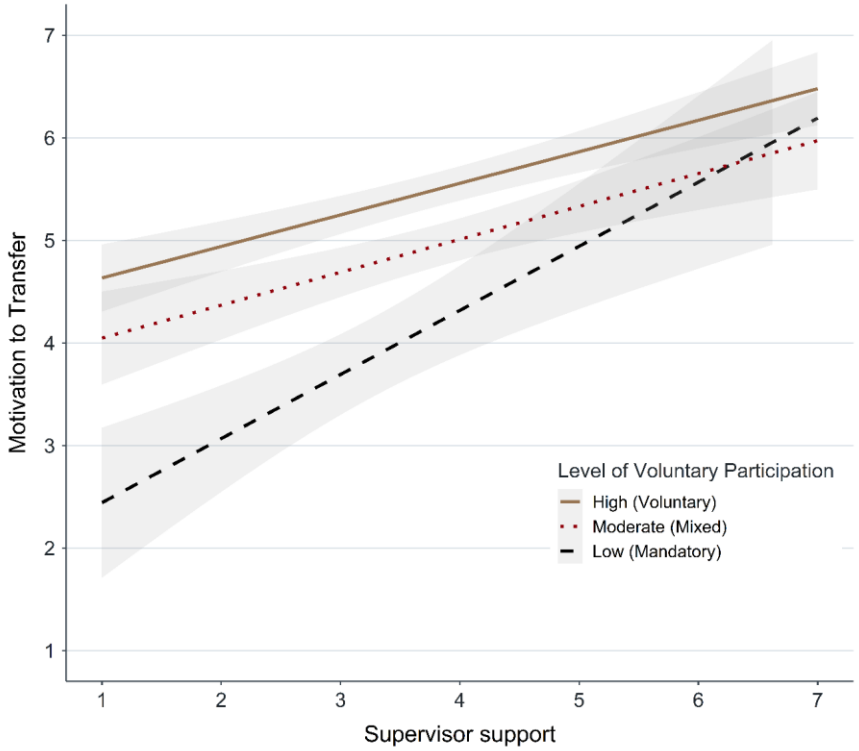
III/3. RESULTS

III/3/1. Motivation to Transfer

For Motivation to Transfer, Model 1 was not significant ($F(8, 303) = 1.406$, $p = .202$, adj.$R^2 = .012$). Model 2 ($F(13, 298) = 2.987$, $p = .001$, adj.$R^2 = .067$) and Model 3 ($F(16, 295) = 13.366$, $p < .001$, adj.R2 = .356) were significant, and the comparison of their fit indices (Δadj.R2 = +.289, ΔAIC = -112.64, ΔBIC = -101.42) indicated the superiority of Model 3. In Model 3, the time lag between training and the outcome measure ($\beta = -.20$, $p < .001$) showed a significant negative effect on motivation to transfer, while none of the other control variables showed significant associations with motivation to transfer: managerial level ($\beta = .14$, $p = .155$), training program length ($\beta = .09$,

p = .166), and receiving materials before classroom training (β = .09, p = .481) and after classroom training (β = .07, p = .529). As expected, motivation to transfer was significantly predicted by the (H1a) level of voluntary participation (β = .35, p < .001), and (H2a) supervisor support (β = .44, p < .001). Results also supported (H3a) the interaction between supervisor support and the level of voluntary participation (β = -.11, p = .043). The interaction effect of these variables can be seen in Figure 1.

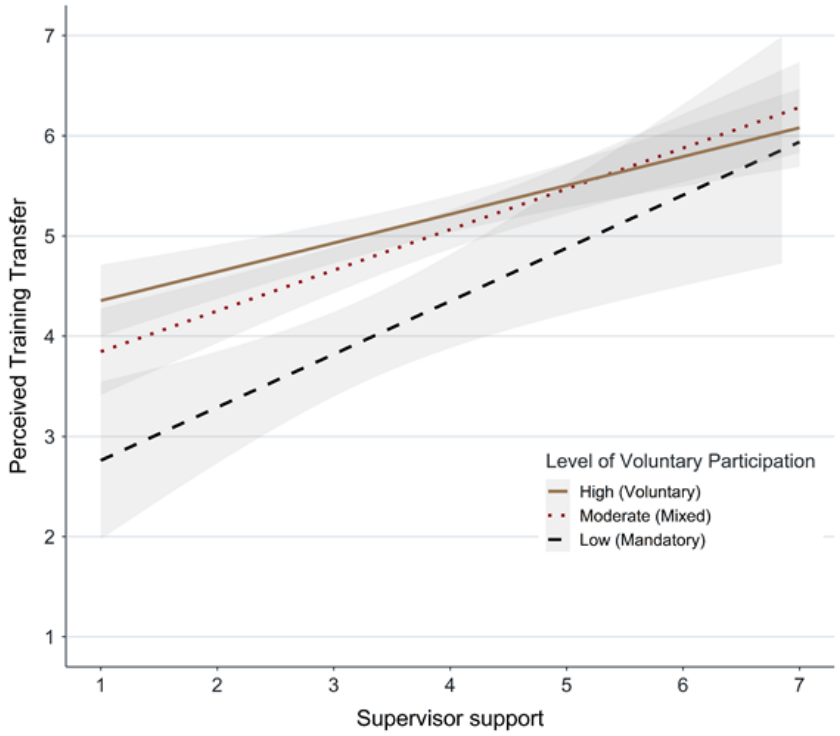
III/Figure 1. Interactive effect of the level of voluntary participation and supervisory support on motivation to transfer



III/3/2. Perceived Training Transfer

With perceived training transfer as the outcome variable, neither Model 1 (F(8, 303) = 0.540, p = .804, adj.R2 = -.01), nor Model 2 (F(13, 298) = 1.729, p = .060, adj.R2 = .032) were significant. Model 3 was significant (F(16, 295) = 8.360, p < .001, adj.R2 = .284). The results showed no significant effect of the time lag between training and the outcome measure (β = -.12, p = .063) on perceived transfer, and similarly, training program length (β = .01, p = .897), receiving materials before classroom training (β = .24, p = .097), and after classroom training (β = -.01, p = .968) did not show a significant association with perceived transfer. Nevertheless, managerial level positively predicted perceived transfer (β = .32, p = .003). In line with our hypotheses, (H1b) the level of voluntary participation (β = .24, p < .001), and the (H2b) supervisor support (β = .47, p < .001) showed significant effects on perceived transfer. H3b was also supported, as the interaction between supervisor support and the level of voluntary participation (β = -.11, p = .040) was significant. The interaction effect can be seen in Figure 2.

III/Figure 2. Interactive effect of the level of voluntary participation and supervisory support on perceived training transfer



III/4. BRIEF DISCUSSION

What stands out most in our findings is that the level of voluntary participation interacts with supervisor support to influence participants' motivation to transfer and perceived transfer. While supervisor support was generally an important predictor of trainees' motivation to transfer and transfer of training, Figures 1 and 2 demonstrate that it was even more important to facilitate these training outcomes when training programs were less autonomous (i.e., mandatory). Since mandatory training is likely to cause lower internal motivation via less trainee autonomous choice and self-determination (Curado et al., 2015; Gegenfurtner et al., 2016), supervisor support seems to be especially important to encourage trainees' motivation to transfer and training transfer in these programs. Without further supervisor support, these participants experience less motivation regarding the training program and its transfer, but if they receive further supervisor support, transfer motivation, and perceived training transfer can be significantly increased.

IV. THE MODERATING EFFECT OF COWORKERS' TRAINING PARTICIPATION ON THE INFLUENCE OF PEER SUPPORT IN THE TRANSFER PROCESS (STUDY 2)[2]

IV/1. AIMS

The impact of the number of coworkers participating in training on transfer outcomes has largely been overlooked. The present study investigates whether the number of coworkers participating in training interacts with peer support to influence training motivation and transfer.

IV/2. MATERIALS AND METHODS

IV/2.1. Participants and Procedure

The same procedure was used as in Study 1. The final sample consisted of 688 working adults (48% female) who were between 22 and 67 years old (Mage = 39, SDage = 8.88). Regarding their organizational levels, 403 (58.6%) worked at a non-managerial level whereas 285 (41.1%) worked at a managerial level. Respondents worked at fourteen mid- to large-size Hungarian companies.

IV/2.2. Measures

Perceived Training Transfer. See Study 1.

Peer Support. A three-item scale was developed to measure the extent of perceived support from colleagues in the on-the-job application of the techniques learned during the training ($\alpha = .87$). Responses were provided on a seven-point Likert-scale (from 1 = *Not true at all* to 7 = *Completely true*).

Motivation to Transfer. See Study 1.

Coworkers' training participation. Respondents were given options to indicate whether their direct colleagues participated in the same training program. The scale reflected three levels of coworkers' training participation, including none, some, and nearly all.

Time lag. See Study 1.

Organizational level. See Study 1. (The same measure was called "Manager")

IV/2.3. Statistical Analysis

Statistical analyses were performed with R 4.0.5 (R Core Team, 2020) using the lavaan package (Rosseel, 2012) for structural equation modeling. First, a preliminary measurement model was estimated, using a confirmatory factor analytic approach, to confirm the factor structure and the psychometric adequacy of the measures used in this study. For the main analyses, this measurement model was converted into the proposed predictive model in which peer support predicted training transfer directly and indirectly through motivation to transfer. In addition, the direct path (between peer support and training transfer) and the mediation path between peer support and motivation to transfer were moderated by coworkers' training participation. Furthermore, the control variables time lag and organizational level were included as predictors of both training transfer and motivation to transfer. In the analysis, 1,000 bootstrap replication

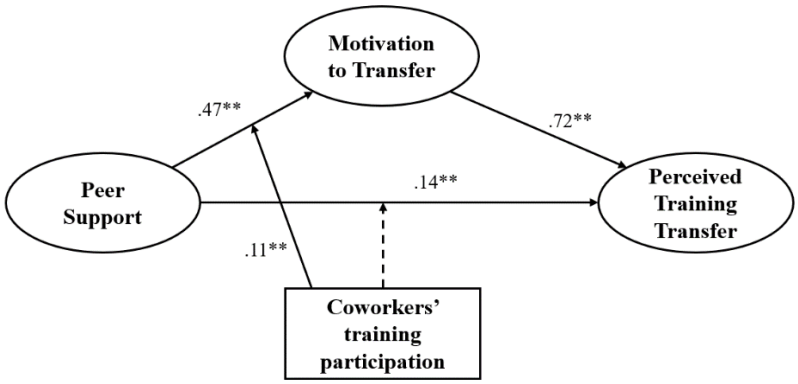
[2] Salamon, J., Blume, B. D., Orosz, G., & Nagy, T. (2022). The Moderating Effect of Coworkers' Training Participation on the Influence of Peer Support in the Transfer Process. *European Journal of Training and Development*. Advance online publication. https://doi.org/10.1108/EJTD-07-2021-0102

samples were used for estimating the 95% bias-corrected confidence intervals (CIs). For estimating the interaction between the observed moderator variable (coworkers' training participation) and the latent variables (peer support and motivation to transfer) in the moderated mediation model, the product indicator approach (PI; Kenny & Judd, 1984) with the double-mean-centering strategy (Lin et al., 2010) was used with structural equation modeling (SEM). Following the recommendations of Yzerbyt et al. (2018) the component approach inspired joint-significance testing of multiple parameter estimates was applied to identify the presence of the indirect effect in moderated mediation. The models were evaluated on the basis of common goodness of fit indices and interpreted along commonly-used cut-off values (Hu & Bentler, 1999; Marsh et al., 2005).

IV/3. RESULTS

The fit indices of the latent moderated mediation model indicated an excellent fit (χ^2=229.809, df=91, CFI=.982, TLI=.976, RMSEA=.047 [90% CI .040, .055]). The results of the model are shown in Figure 1. Regarding control variables, the time lag between training and the outcome measures showed a significant negative effect on motivation to transfer (β=-.09, p=.010), and no effect on training transfer (β=.01, p=.854). In contrast, organizational level showed significant association with training transfer (β=.06, p=.016) and non-significant association with motivation to transfer (β=-.01, p=.777).

IV/Figure 1. Latent moderated mediation statistical model, representing the effect of peer support on training transfer mediated by motivation to transfer, and moderated by coworkers' training participation.



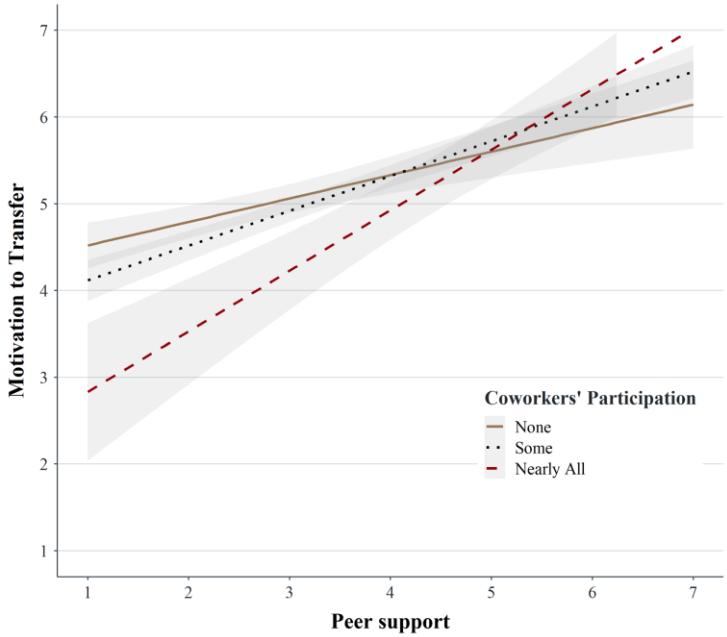
Notes. *p < .05, **p < .01; One-headed arrows and coefficients represent standardized regression weights. The hypothesized, non-significant path is drawn with a dotted line. For clarity purposes, the control variables and correlations among exogenous latent variables are excluded from the figure.

In line with our expectations, H1a and H1b were supported. Peer support had a significant, direct effect both on training transfer (β=.14, p<.001) and motivation to transfer (β=.47, p<.001). Furthermore, in support of H1c, motivation to transfer had a positive, significant relationship with training transfer (β=.72, p<.001). The joint-significance of individual parameter estimates of the indirect effects show the presence of motivation to transfer's mediating effect on the relationship between peer support and training transfer (β=.34, p<.001). This result supported our hypothesis H1d.

In contrast to our expectations, H2a was not supported. The interaction of peer support and coworkers' training participation (β=-.01, p=.776) on the relationship between peer support and training transfer was not significant (i.e., the moderating effect of coworkers' training participation was not supported). H2b was supported as results indicate that the interaction between peer support and coworkers' training participation had a positive, significant effect on the motivation to transfer (β=.11, p=.004). The joint-significance of individual parameter estimates for the indirect effects also provided support for the first-stage moderated mediation (β=.08, p=.006) in H2c.

The significant interaction between peer support and coworkers' training participation on motivation to transfer (see Figure 2) represents the importance of training cohort composition. As more coworkers participated in a training program, the peers' supportive or non-supportive behavior had more of an impact on trainee motivation to transfer.

IV/Figure 2. Interaction effect of coworkers' training participation and peer support on motivation to transfer.



Notes. The figure shows that peer support has a stronger association with the motivation to transfer if nearly all coworkers are present in the training, compared to participating with some or no coworkers. Lines represent linear predictions, and gray bands represent the standard error of predictions.

IV/4. BRIEF DISCUSSION

In the present study, we successfully replicated previous findings regarding the association between peer support, motivation to transfer, and training transfer. More importantly, we also found that coworkers' training participation moderated the effect of peer support on the transfer process. Although the number of coworkers participating in training did not moderate the direct relationship between peer support and perceived training transfer, its moderation effect was present in the motivation to transfer mediated path. The moderated mediation effect highlights the importance of the number of coworkers participating in training.

V. HAVING THE CAKE AND EATING IT TOO: FIRST-ORDER, SECOND-ORDER AND BIFACTOR REPRESENTATIONS OF WORK ENGAGEMENT (STUDY 3)[3]

V/1. AIMS

The present study aims to contribute to the ongoing scientific debate about the dimensionality of work engagement by systematically comparing one-factor, first-order, higher-order, and bifactor confirmatory factor analytic (CFA) representations of work engagement measured by the short version of Utrecht Work Engagement Scale (UWES-9). The study also aims to document the validity evidence of the most optimal representation based on its test-criterion relationship with other, relevant work-related constructs.

V/2. MATERIALS AND METHODS

V/2.1. Participants and Procedure

Participants for this study were recruited through company mailing lists as well as through social media groups. Two samples were used in the current study. Participants in both samples were employees in a wide variety of organizations and job roles across Hungary. Sample 1, consisted of 242 working adults (184 females, 76%) who were aged between 18 and 73 years ($M_{Sample1}$ = 35.81, $SD_{Sample1}$ = 13.46) and worked in different organizational levels (48 blue collars: 20%, 136 white collars: 56%, 58 managers: 24%). Sample 2, consisted of 505 working adults (359 female, 71%) who were aged between 20 and 71 years ($M_{Sample2}$ = 37, $SD_{Sample2}$ = 11.27), and worked in different organizational levels (75 blue collars: 15%, 287 white collars: 57%, 143 managers: 28%).

V/2.2. Measures

Work Engagement (both Sample 1 and 2). The short version of the Utrecht Work Engagement Scale (UWES-9, Schaufeli et al., 2006) was used that measures the three underlying dimensions of work engagement: vigor, dedication, and absorption. Responses were provided on a seven-point Likert-scale (from 1 = *never* to 7 = *always*). The UWES-9 was adapted to Hungarian with a standardized translation-back translation protocol proposed by Beaton et al. (2000).

Turnover Intention (Sample 1). A three-item scale adapted from the questionnaire developed to measure high school dropout intention (Hardre & Reeve, 2003; Vallerand et al., 1997) was used to measure workers' turnover intentions. Items were translated following the standardized translation-back translation protocol proposed by Beaton et al. (2000) and slightly modified to reflect turnover intention in the work context. Each item was scored on a five-point Likert-scale (from 1 = *very uncharacteristic* to 5 = *very characteristic*).

Basic Psychological Need Fulfillment (Sample 1). The Hungarian version (Tóth-Király et al., 2018) of the 24-item Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS, Chen et al., 2015) was used to measure individuals' work-related need satisfaction and frustration. Instructions were slightly adapted to the work context, while the items themselves were used without any modification. The scale measures six factors: autonomy satisfaction, relatedness satisfaction, competence satisfaction, autonomy frustration, relatedness frustration, and

[3] Salamon, J., Tóth-Király, I., Bőthe, B., Nagy, T., & Orosz, G. (2021). Having the Cake and Eating It Too: First-Order, Second-Order and Bifactor Representations of Work Engagement. *Frontiers in Psychology*, 3030. https://doi.org/10.3389/fpsyg.2021.615581

competence frustration. Respondents indicated their level of agreement using a five-point Likert-scale (from 1 = *strongly disagree* to 5 = *strongly agree*).

Work Addiction (Sample 2). The seven-item Hungarian version (Orosz et al., 2016) of the Bergen Work Addiction Scale (BWAS-H, Andreassen et al., 2012) was administered to measure work addiction. Items were rated on a five-point scale (1 = *never*, 5 = *always*).

Work Satisfaction (Sample 2). A five-item scale adapted from the Satisfaction with Life Scale (Diener et al., 1985; Martos et al., 2014) was used to measure respondents' satisfaction with their works. Following prior applications (Fouquereau & Rioux, 2002; Tóth-Király et al., 2021), items were modified to refer to work instead of life in general. Respondents indicated their level of agreement using a seven-point Likert-scale (from 1 = *strongly disagree* to 7 = strongly agree).

V/2.3. Statistical Analysis

Statistical analyses were performed with SPSS 22 and M*plus* 8 (Muthén & Muthén, 1998-2017). For factor analyses, the robust maximum likelihood estimator (MLR) was used as this estimator robust to non-normality and is more preferable when the response scale has more than five categories (Morin et al., 2020). The first step of the analyses comprised of the estimation of four alternative CFA solutions: (1) a one-factor solution; (2) a first-order (including the 3 specific factors); (3) a second-order (including the 3 specific factors and a higher-order work engagement factor); and a (4) bifactor solution (including the 3 specific factors and a co-existing work engagement factor). All these models were estimated separately for the two samples. In the comparison of first-order and bifactor models, we followed the guidelines of Morin et al. (2016) and apart from goodness-of-fit, we also carefully examined the standardized parameter estimates with an emphasis on the size of the correlations between the factors.

In the second stage, using the most optimal measurement model, tests of measurement invariance were conducted (Meredith, 1993; Millsap, 2011) across samples (Sample 1 vs. Sample 2) to ascertain that we relied on identical sets of indicators when investigating validity evidence based on test-criterion relationship and to test the replicability of the measurement structure. In addition, to assess the generalizability of the most optimal model to subgroups of people, we conducted the same tests of measurement invariance across groups based on gender (male vs. female), age (young adult vs. middle-old adult), and organizational level (blue collar employee vs. white collar employee vs. managers). Following typical specifications, tests of measurement invariance were conducted in a sequence where equality constraints are gradually added to the various parameters, ranging from the least restrictive model to the most restrictive one (Millsap, 2011).

Models were evaluated on the basis of common goodness of fit indices and interpreted along their commonly-used cut-off values (Hu & Bentler, 1999; Marsh et al., 2005). As for measurement invariance, relative changes (Δ) in the fit indices were examined (Chen, 2007; Cheung & Rensvold, 2002) where a decrease of at least .010 for CFI and TLI and an increase of at least .015 for RMSEA indicate lack of invariance. We also calculated the root deterioration per restriction (RDR; Browne & Du Toit, 1992) index which rescales the chi-square difference to approximate an RMSEA metric. Following suggestions by Raykov and Penev (1998; see also Pekrun et al., 2019), RDR was interpreted in relation to RMSEA (i.e., RDR < .05 indicates strong equivalence, RDR < .08 indicates acceptable equivalence). Spearman correlations were calculated between the factors to assess the validity evidence of the bifactor-CFA solution based on its test-criterion relationship. Reliability was assessed with the model-based omega composite reliability

coefficient (McDonald, 1970; Morin et al., 2020) and values above .500 are considered adequate (Perreira et al., 2018).

V/3. RESULTS

V/3.1. Structural Analysis and Measurement Invariance

The one-factor solution had poor fit in both samples. The three-factor CFA model had marginally acceptable fit in Sample 1 (although RMSEA did not reach the minimum .080), and acceptable fit in Sample 2 (CFI and TLI > .90, RMSEA = .08). Correlations between the three engagement factors were high in both Sample 1 (between .778 and .887, M = .827) and Sample 2 (between .773 and .907, M = .850), suggesting conceptual redundancies between the three factors. However, the magnitude of these correlations might be inflated by an unmodeled G-factor. To test this assumption, we contrasted second-order and bifactor models (incorporating one work engagement G-factor and the three S-factors). The fit of the second-order model was identical to that of the first-order model. However, fit for the bifactor models was good (CFI and TLI > .95, RMSEA ≤ .08) and it was superior to the first-order models (Sample 1: ΔCFI = +.036, ΔTLI = +.043, ΔRMSEA = -.036; Sample 2: ΔCFI = +.018; ΔTLI = +.021; ΔRMSEA = -.018). The work engagement G-factor was well-defined in both samples (Sample 1: λ = .729 to .883; Sample 2: λ = .702 to .921) as were the vigor (Sample 1: λ = .160 to .602; Sample 2: λ = .142 to .513) and absorption (Sample 1: λ = .119 to .632; Sample 2: λ = .215 to .484) S-factors. In contrast, the dedication S-factor (Sample 1: λ = .187 to .399; Sample 2: λ = -.500 to .042) had a comparatively weaker definition.

In the next step, measurement invariance was tested across the two samples to verify the replicability of the final bifactor-CFA model. The configural model with no equality constraints provided a reasonably good model fit based on CFI and TLI (.968 and .937, respectively), but not RMSEA (.094). Still, the confidence interval of the latter reached the level of acceptability (i.e., .080), suggesting that the factor structure is reasonably similar across samples. Next, we put equality constraints on the factor loadings, which led to substantial improvements in model fit (ΔCFI = +.018, ΔTLI = +.043, ΔRMSEA = -.041; RDR = .061), providing good support for the weak invariance of the bifactor-CFA measurement model. The gradual inclusion of the equality constraints on the additional parameters (i.e., intercepts, uniquenesses, latent variances and covariances, and latent means) showed that (1) CFI, TLI, and RMSEA indicated good fit on all invariance levels; (2) decreases in CFI and TLI were never above .010 with the highest being -.002; (3) increases in RMSEA were never above .015 with the highest change being +.001; and (4) all RDR values remained below .05. Highly similar results were obtained when the bifactor-CFA was contrasted along groups based on gender, age, and organizational level, all of which converged on the same conclusions and thus supporting the latent mean invariance and the replicability of the bifactor-CFA solution across samples, gender, age, and organizational level.

Parameter estimates from the latent mean invariant measurement model showed a well-defined and highly reliable work engagement G-factor (λ = .712 to .905, M = .793, ω = .961). Once the effect of the G-factor was taken into account, the vigor (λ = .144 to .576, M = .395, ω = .655) and absorption (λ = .156 to .554, M = .343, ω = .573) S-factors retained a meaningful amount of specificity as opposed to the dedication S-factor (λ = .046 to .465, M = .193, ω = .379) which retained a smaller amount of specificity. The present results suggest that the dedication items mostly reflected participants' global levels of work engagement instead of the pure dedication associated with this S-factor over and above the G-factor. When examining a bifactor solution, it is important to keep in mind that not all S-factors should be strongly defined and that S-factors

tend to be weaker in bifactor representations because the items are associated with two factors (G- and S-factors) instead of one (S-factor) as in the first-order solution. In a similar vein, it should also be kept in mind that the present model used fully latent variables (instead of manifest scale scores) which are naturally corrected for measurement error and thus the factors should be considered reliable.

V/3.2. Validity Evidence Based on Test-Criterion Relationship

In order to assess the validity evidence of the bifactor-CFA solution based on its test-criterion relationship, Spearman correlations were calculated between the factors. Factors were represented by factor scores (standardized with 0 mean and 1 standard deviation) derived from the latent mean invariant measurement model for work engagement and from preliminary measurement models estimated a priori. These preliminary measurement models also allowed us to ascertain that the correlates had adequate validity evidence and reliability.

Global levels of work engagement positively correlated with global levels of need fulfillment (r = .561, p < .001), as well as with specific levels of autonomy satisfaction (r = .440, p < .001) and relatedness satisfaction (r = .170, p = .008), while being negatively related to specific levels of autonomy frustration (r = -.249, p < .001) and turnover intentions (r = -.646, p < .001). Over and above the work engagement G-factor, some of the engagement S-factors also showed additional relations with the correlates, giving support for their added value. More specifically, there was a weak positive correlation between vigor and need fulfillment G-factor (r = .178, p = .006), between dedication and autonomy satisfaction (r = .158, p = .014), and between absorption and relatedness frustration S-factors (r = .160, p = .013). In addition, the dedication S-factor negatively correlated with turnover intention (r = -.150, p = .020).

When taking a look on the correlations involving Sample 2, there was a strong positive correlation (r = .713, p < .001) between work satisfaction and global levels of work engagement as well as a weak positive correlation between global levels of work engagement and work addiction (r = .134, p = .003). Once again, the added value of the S-factors is supported by the weak positive correlation between dedication S-factor and work satisfaction (r = .131, p = .003) and by the weak positive correlation between work addiction and absorption S-factor (r = .198, p < .001).

V/4. BRIEF DISCUSSION

The results supported the superiority of the bifactor representation of work engagement. In addition, the bifactor representation was well-replicated across the two distinct samples. In this bifactor representation, the G-factor can be seen as a direct reflection of employees' global level of work engagement, while the S-factors are posited to reflect the presence of employees' vigor, dedication, and absorption over and above, and independently from, their global levels of engagement. The findings with respect to the validity evidence based on test-criterion relationship of the UWES-9 do not only highlight the importance of the global levels of work engagement, but also the added value of the specific levels of vigor, dedication, and absorption.

VI. THE POSITIVE GAIN SPIRAL OF JOB RESOURCES, WORK ENGAGEMENT, OPPORTUNITY, AND MOTIVATION ON TRAINING TRANSFER (STUDY 4)[4]

VI/1. AIMS

According to previous studies, general environmental characteristics and job-related factors influence employees' transfer of learned skills to the job. However, among job-related variables, the role of work engagement in connection with transfer motivation, opportunity, and training transfer has not received much research attention. Building upon the theoretical background of the job demands-resources model, the present study aims to investigate the relationship between job resources/demands and training transfer through work engagement, transfer motivation, and opportunity to transfer.

VI/2. MATERIALS AND METHODS

VI/2.1. Participants and Procedure

The same procedure and sample was used as in Study 1.

VI/2.2. Measures

Job demands and resources. We used a 10-item scale (Demerouti et al., 2001) to measure respondents' perceived job demands and resources. All items were rated on a five-point Likert-scale (1 = *not true at all*, 5 = *very true for it*).

Work Engagement. See Study 3.

Opportunity to Transfer. A three-item scale was developed for the purpose of the present study to measure the perceived opportunities of using the techniques learned during the training. All items were scored on a seven-point Likert-scale (1 = *Not true at all*, 7 = *Completely true*).

Motivation to Transfer. See Study 1.

Training Transfer. See Study 1.

Time Lag. See Study 1.

VI/2.3. Statistical Analysis

Statistical analyses were performed with R 4.0.3 (R Core Team, 2020) using the robust maximum likelihood (MLM) estimator, which provides tests of model fit and standard errors that are robust to non-normality. First, a preliminary measurement model was estimated, using a confirmatory factor analytic (CFA) approach, to confirm the factor structure and the psychometric adequacy of the measures used in this study. Relying on fully latent variables also allowed us to reduce the biasing effect of item-level measurement error (Finkel, 1995), in turn obtaining more accurate parameter estimates.

For the main analyses, this measurement model was converted into the proposed predictive model in which the two job characteristics (job resources and demands) predicted work engagement and the training-related variables (opportunity and motivation to transfer as well as training transfer). In addition, work engagement also predicted the training-related variables, while opportunity and motivation to transfer predicted training transfer. Furthermore, the control variable

[4] Salamon, J., Blume, B. D., Tóth-Király, I., Nagy, T., & Orosz, G. (2022). The Positive Gain Spiral of Job Resources, Work Engagement, Opportunity, and Motivation on Training Transfer. *International Journal of Training and Development*. Advance online publication. https://doi.org/10.1111/ijtd.12277

time lag was included as a predictor of both work engagement, opportunity to transfer, motivation to transfer, and training transfer. In the predictive model, to test potential mediating mechanisms, 95% bias-corrected bootstrapped confidence intervals were also computed. Based on Preacher and Hayes (2008), 5000 bootstrap replication samples were requested, and the mediation was considered statistically significant if the confidence intervals exclude zero. The models were evaluated on the basis of common goodness of fit indices and interpreted along commonly-used cut-off values (Hu & Bentler, 1999; Marsh et al., 2005).

VI/3. RESULTS

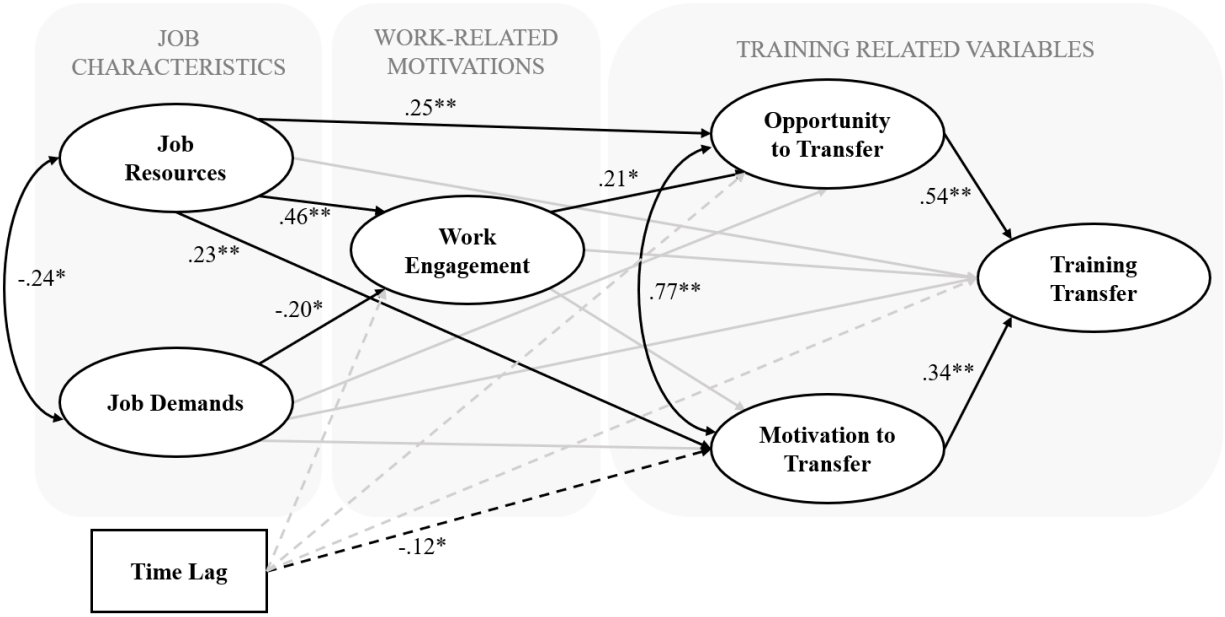
The goodness-of-fit indices of the preliminary measurement model were adequate (χ^2 = 763.760, df = 362, CFI = .919, TLI = .909, RMSEA = .057 [90% CI .052, .063]). The results of the proposed model are also shown on Figure 1. The control variable of time lag (days elapsed between training and data collection) was negatively related to motivation to transfer (β = -.124 [95% CI -.316, -.019], p = .027), but it was not significantly related either to training transfer (β = .011 [95% CI -.072, .100], p = .747), opportunity to transfer (β = -.090 [95% CI -.248, .032], p = .131), or to work engagement (β = .036 [95% CI -.054, .105], p = .525). As expected, job resources positively related to motivation to transfer (H1b: β = .225 [95% CI .126, .638], p = .003), opportunity to transfer (H1c: β = .251 [95% CI .126, .626], p = .003), and work engagement (H3a: β = .456 [95% CI .271, .553], p < .001), while training transfer was not directly related to it (H1a: β = .003 [95% CI -.157, .169], p = .946). In line with the expectations, job demands were negatively related to work engagement (H3b: β = -.196 [95% CI -.533, -.036], p = .025). Job demands were not significantly related to training transfer (H2a: β = -.073 [95% CI -.157, .169], p = .212), motivation to transfer (H2b: β = -.107 [95% CI -.820, .234], p = .276), or to opportunity to transfer (H2c: β = .090 [95% CI -.246, .681], p = .358).

Consistent with our expectations, work engagement had a direct positive relationship with opportunity to transfer (H4c: β = .211 [95% CI .072, .625], p = .014). Work engagement did not have a direct relationship either with training transfer (H4a: β = -.056 [95% CI -.270, .071], p = .252) or with motivation to transfer (H4b: β = .107 [95% CI -.088, .489], p = .173). Nevertheless, both motivation to transfer (H5a: β = .340 [95% CI .148, .494], p < .001) and opportunity to transfer (H5b: β = .542 [95% CI .359, .804], p < .001) positively related to training transfer, as expected.

In line with our expectations, mediation analysis yielded a significant indirect path between job resources and training transfer through opportunity to transfer (H6b: indirect β = .136, 95% CI = .064 to .464), job resources, and training transfer through work engagement and opportunity to transfer chain (H8a: indirect β = .052, CI = .021 to .197), and job resources and training transfer through motivation to transfer (H6c: indirect β = .076, CI = .030 to .276). In contrast with our expectations, work engagement did not mediate the relationship between job resources and training transfer (H6a: indirect β = -.026, CI = -.125 to .032), and the indirect path between job resources and training transfer through work engagement and motivation to transfer chain was not significant (H8b: indirect β = .017, CI = -.010 to .093). Regarding the relationships of job demands, only one path showed a negative, significant indirect relationship between job demands and training transfer through work engagement and opportunity to transfer chain (H9a: indirect β = -.022, CI = -.243 to -.007), as we expected. However, none of the other hypothesized mediation paths between job demands and training transfer were significant: the relationship between job demands and training transfer was not significantly mediated by work engagement (H7a: indirect β = .011, CI = -.012 to .157), opportunity to transfer (H7b: indirect β = .049, CI = -.185 to .501), motivation to transfer (H7c: indirect β = -.036, CI = -.427 to .064), and the indirect path between job demands and

training transfer through work engagement and motivation to transfer chain was not significant (H9b: indirect β = -.007, CI = -.096 to .003). The proportion of explained variance was 68.6% for training transfer, 29.0% for work engagement, 15.3% for opportunity to transfer and 13.1% for motivation to transfer.

VI/Figure 1. Results of the proposed predictive model.



Notes. *p < .05; **p < .01. Fitted model of the relationship of latent constructs for predicting training transfer. Coefficients represent standardized regression weights. A dashed line indicates an effect is not hypothesized between the manifest variable of time lag (serving as a control variable) and the latent mediator and outcome variables. Gray arrows represent non-significant paths. Observed variables are not depicted to preserve readability.

VI/4. BRIEF DISCUSSION

The findings are consistent with the positive gain spiral of job resources and the propositions of the resource caravan passageways principle of conservation of resources theory (Hobfoll et al., 2018). These imply that available resources in the work environment (e.g., autonomy, support, feedback) positively influence individuals' work engagement, which further increase their sensitivity to perceive and proactively seek opportunities to transfer learned skills to the job. The increased amount of perceived and sought/created transfer opportunities leads to increased transfer, which probably further improves personal and organizational resources. According to the findings, job demands seems to be less influential. The construct of job demands showed a negative relationship with work engagement (similarly to previous findings, e.g., Halbesleben, 2010; Mauno et al., 2007; Trépanier et al., 2014), but it was not directly related to any other elements of the transfer process. These results only partially support the resource loss spiral assumptions of conservation of resources theory (Hobfoll, 2018). The findings show that job demands only have an indirect, negative effect on training transfer through the work engagement and opportunity to transfer chain.

VII. GENERAL DISCUSSION

VII/1. BRIEF SUMMARY OF THE MAIN FINDINGS OF THE PRESENT STUDIES

The training transfer literature investigated several individual, training design, and environmental characteristics that influence successful training transfer. Following the suggestions of Ford et al. (2018), the present dissertation aimed to investigate research questions that are one step beyond the well-established predictor-outcome relationships and to increase our understanding in whether and how the most important factors and relationships can be influenced. It also aimed to unfold the reasons for some previously controversial findings and to investigate previously neglected contextual aspects that can potentially impact the transfer process. The carefully selected samples allowed us to investigate these specific aspects of the training programs that are not possible to investigate if data collection is targeted only one type of program in one organization.

In line with this endeavor, *Study 1* in the present dissertation unveiled the potential reason for the previously conflicting findings regarding the best attendance policy that can lead to the most beneficial outcomes. The findings of *Study 1* underlined that higher level of voluntary participation leads to better transfer results and supervisor support is more needed when the participation is less driven by autonomous motivation. *Study 2* investigated whether and how coworkers' training participation can influence the well-known positive effect of peer support on the transfer process. According to the findings, the effect of peer support on motivation to transfer is stronger when a higher number of coworkers participate in a training program. However, especially in these programs, participants' motivation can be diminished if they do not receive support from their coworkers. These studies emphasize both the important role of training-related social support in connection with transfer motivation and training transfer, and their interplay with individual and training organization related factors (i.e., the level of voluntary participation and coworkers' training participation).

The *Study 3* of the present dissertation validated the Hungarian version of the Utrecht Work Engagement Scale. It also demonstrated that there is a potentially better alternative to the ongoing scientific debate about whether work engagement is experienced as a global construct, or as its three components (vigor, dedication, absorption). The results of the study supported the superiority of the bifactor-CFA representation including a global factor of work engagement and three co-existing specific factors of vigor, dedication, and absorption. According to the results of this study, the specific factors of work engagement have their unique added value beyond the global factor of work engagement. Although the findings of *Study 3* supported the superiority of the bifactor representation of work engagement, *Study 4* applied the simpler, but still well-defined, one-factor representation of work engagement to investigate its general role between job resources, job demands, and the transfer process. The findings of the study demonstrated the existence of the positive gain spiral in the training transfer context. Accordingly, training participants whose work environment has sufficient resources experience stronger work engagement and can transfer learned skills to the job more successfully by perceiving and proactively creating more opportunities to transfer.

VII/2. IMPLICATIONS OF THE PRESENT DISSERTATION

VII/2.1. Theoretical Implications

The present dissertation addressed some aspects of training transfer research that either received less research interest despite its potential influence on transfer success (i.e., coworkers' training participation), considered as controversial but plays a central role in practice (i.e., the level

of voluntary participation), or investigated how situational factors (i.e., job resources and job demands) generates direct and indirect influence (through work engagement) on the transfer process. These addressed research questions are aligned well with the primary research directions of the training transfer field. They targeted questions that can support our understanding of whether and how the already known, essential transfer factors and their relationships can be influenced (Ford et al., 2018). Furthermore, the examined relationships are also in line with the interactionist perspective that emphasizes the importance of the interplay between individual and contextual factors in training transfer (Blume et al., 2019).

The findings of *Study 1* and *Study 2* imply the distinguished importance of the social context (e.g., social support and the expectations and acceptance regarding the transfer of learned skills) in connection with the success of soft skill training transfer. Although several previous studies identified the importance of social support (e.g., Hughes et al., 2020), the studies in the present dissertation are among the first that investigated its interconnections with the attendance policy and coworkers' training participation. These studies provided evidence for the interplay between the individual and contextual factors and utilized the Self-Determination Theory (Deci & Ryan, 2000; Ryan & Deci, 2000, 2017), the Social Information Processing Theory (Salancik & Pfeffer, 1978), and the Social Cognitive Theory (Bandura, 1986) for the explanation of these interconnections.

The findings of *Study 3* demonstrated that work engagement might be best represented by a bifactor solution, which simultaneously incorporating a global work engagement construct, as well as the three components of vigor, dedication, and absorption. The findings not only provide an improved representation of work engagement, but also a clearer picture of the different relations of the global and specific components of work engagement to other, relevant work-related constructs. Although according to the findings of *Study 3* the bifactor representation of work engagement is the best solution, the last study of the present research (*Study 4*) integrated only the global work engagement factor. While it led to losing some additional information about the role of specific components, it also supported us not to overcomplicate the model that the study aimed to investigate. Consequently, in *Study 4* we were able to investigate the theory-based assumptions of the relationship between general environmental characteristics, a work-related variable, and the training transfer process. The study findings support the assumption of the positive gain spiral in the training transfer context, and suggest that job demands and resources theory (Bakker & Demerouti, 2017), and the conservation of resources theory (Hobfoll, 1989) can provide a conceptual basis for the working mechanism and antecedents of training transfer. The studies in the present dissertation not just demonstrated the important role of the resource-rich, supportive social environment, but provided theory-based contextual aspects that can moderate their importance and effect.

VII/2.2. Practical Implications

The findings of the present dissertation provide several practical implications that can be applied by HRD practitioners. First and foremost, the findings of *Study 1* indicate that especially in circumstances where not possible to provide maximum autonomy to learners, direct supervisors should create conditions of the highest level of autonomy that can be achieved. Furthermore, training transfer could be also increased if beyond the expectation of training participation, the application would be also expected and supported by supervisors. To support this endeavor, organizations should prepare and encourage supervisors to be able to create a supportive

environment, apply autonomy-supportive techniques and provide the support for transfer training in an adequate way that suits their employees need.

The implications of *Study 2* are suggesting that the influence of peer support (a consistently found important predictor of training transfer) can be increased when more coworkers are participating on the same training program. The implementation of this into the practice of organizing training programs could also address the social environment's resistance to change issues that, according to Laker and Powell (2011), have a greater chance in the case of soft skill training programs. However, the positive attitude towards training programs, their relevance and their appropriate design are probably even more important in these programs.

The findings of *Study 3* demonstrate that the measure have adequate validity evidence and reliability, which supports its application in future research. Furthermore, the findings also suggest that future programs that aim to increase work engagement should consider both the global level of work engagement and its subfactors because these together can support the identification of the best and probably more specific intervention targets, which may improve the success of the applied intervention. *Study 4* implies that organizations should create an environment that provides employees with the necessary resources and positively influences their work engagement, affecting transfer success through a higher level of opportunity and motivation to transfer.

VII/3. LIMITATIONS AND FUTURE DIRECTIONS

VII/3.1. Limitations of the Present Dissertation

Although the studies in the present dissertation have several strengths, they also have some limitations that must be noted. The limitations of each study discussed in detail. Therefore, the current section summarizes only those limitations that are related to all included studies. First, the studies of the present dissertation applied cross-sectional design which limits causal interpretation of the investigated relationships. Second, all studies were based on self-report data, which can be affected by social desirability. Thus, responses might have been biased. While self-reported data is found to be less problematic regarding variables measure internal states (e.g., perception, attitude, engagement, or motivation; Spector, 2019), other sources of information (e.g., peers, supervisors) and more objective measures (e.g., performance indicators) could improve the reliability of other (e.g., outcome) measures. Third, as all studies in the present dissertation were based solely on samples of Hungarian working adults, care should be taken when generalizing the findings across countries. Fourth, the studies that investigated training transfer included exclusively open/soft skill training programs. Consequently, the generalizability of the findings to hard-skill training programs requires further research investigation.

Furthermore, learning outcomes were not measured or controlled in the studies of the present dissertation that investigated training transfer. Although we made several attempts to ensure respondents were able to adequately recall their relevant experiences, the studies' design did not allow us to adequately assess whether learning happened at all. Moreover, although in Study 1, a few training design elements were controlled, they were not detailed and comprehensive enough to allow us to appropriately compare the investigated programs' quality. While these were not in the focus of the present studies, if feasible, implementing them in future studies could further improve our understanding of the importance of these training design elements and their interactions with the investigated variables.

VII/3.2. Future Directions

As the studies of the present dissertation are based on cross-sectional data, future research utilizing a different, longitudinal design could provide more accurate information about the directionality of the investigated relationships. It could also make it possible to investigate training effectiveness by measuring change in targeted cognitive, behavioral and/or affective learning outcomes. Furthermore, the application of more sophisticated measures that reflect on generalization, maintenance, individual/team/organizational performance improvement or other business results could provide information about the training impact. Moreover, an experience sampling design could provide further information about the effect of periodic fluctuations of variables like work engagement, motivation, self-efficacy, opportunity, and success of transfer attempts on the transfer process (Sonnentag, 2003, Huang et al., 2017). This kind of research method would also allow researchers to apply the dynamic interactionist perspective (e.g., Blume et al., 2019) and investigate the interplay between individual and contextual variables over time. In addition, in future studies, the outcome measure of training transfer would be also promising to differentiate between the other types of use (assess, explain, instruct, lead; Ford et al., 2019).

As it was mentioned in the limitations section, the generalizability of the findings of the transfer studies in the present dissertation (*Study 1*, *Study 2*, and *Study 4*) to closed/hard skill training programs require further research. Besides, future research is also needed to improve our understanding whether the findings can be generalized to different types of soft skill training programs (e.g., programs targeting interpersonal skills like assertive communication versus intrapersonal skills like the stress management skills).

Although the important role of work engagement in the transfer process was shown in *Study 4*, future research investigating the role of the specific factors of work engagement in the transfer process could be promising. As it was shown in *Study 3* that above and beyond the effect of general work engagement, the specific factors have their own added value in connection with other relevant work-related factors. Consequently, future studies utilizing the bifactor representation of work engagement could investigate their specific roles in the transfer process.

VII/4. FINAL CONCLUSIONS

The present dissertation aimed to investigate research questions that can increase our understanding in whether and how the most important transfer factors and their relationships can be influenced. Furthermore, studies in the dissertation made an attempt to unfold the reasons for some previously controversial findings and investigated some previously neglected contextual aspects that can potentially impact the success of training transfer. In line with these endeavors and applying an interactionist perspective, some of the studies identified conditions where social support have more impact on the transfer success. One of these conditions – coworkers' training participation – was a relatively neglected aspect of training programs in previous transfer studies. The findings regarding the other condition, where social support have more impact on the transfer success (i.e., in connection with the attendance policy), are unveiled potential reason for the previously conflicting findings in the transfer literature. These studies also highlighted the special importance of social support in the transfer of soft skill training programs. Furthermore, the results of the present dissertation also increase the understanding of the effect of the general environment and the work-related variables on the transfer process and provide theoretical explanations of the potential underlying psychological mechanisms of these effects. The findings of the dissertation can be utilized by organizational practice that aims to increase training transfer success and can also contribute to the basis of some promising future research directions.

VIII. REFERENCES

Andreassen, C. S., Griffiths, M. D., Hetland, J., & Pallesen, S. (2012). Development of a work addiction scale: Development of a work addiction scale. *Scandinavian Journal of Psychology*, *53*(3), 265–272.

Arthur, W., Bennett, W., Edens, P. S., & Bell, S. T. (2003). Effectiveness of training in organizations: A meta-analysis of design and evaluation features. *Journal of Applied Psychology*, *88*(2), 234–245.

Axtell, C. M., Maitlis, S., & Yearta, S. K. (1997). Predicting immediate and longer-term transfer of training. *Personnel Review*, *26*(3), 201–213.

Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, *22*(3), 273–285.

Baldwin, T. T., & Ford, J. K. (1988). Transfer of training: A review and directions for future research. *Personnel Psychology*, *41*(1), 63–105.

Baldwin, T. T., & Magjuka, R. J. (1991). Organizational training and signals of importance: Linking pretraining perceptions to intentions to transfer. *Human Resource Development Quarterly*, *2*(1), 25–36.

Baldwin, T. T., Magjuka, R. J., & Loher, B. T. (1991). The perils of participation: Effects of choice of training on trainee motivation and learning. *Personnel Psychology*, *44*(1), 51–65.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall, Inc.

Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures: *Spine*, *25*(24), 3186–3191.

Blair, G., Cooper, J., Coppock, A., Humphreys, M., & Sonnet, L. (2020). *estimatr: Fast Estimators for Design-Based Inference* (R Package version 0.22. 0) [Computer software]. https://CRAN.R-project.org/package=estimatr

Blume, B. D., Ford, J. K., Baldwin, T. T., & Huang, J. L. (2010). Transfer of Training: A Meta-Analytic Review. *Journal of Management*, *36*(4), 1065–1105.

Blume, B. D., Kevin Ford, J., Surface, E. A., & Olenick, J. (2019). A dynamic model of training transfer. *Human Resource Management Review*, *29*(2), 270–283.

Breusch, T. S., & Pagan, A. R. (1980). The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics. *The Review of Economic Studies*, *47*(1), 239.

Browne, M. W., & Du Toit, S. H. C. (1992). Automated Fitting of Nonstandard Models. *Multivariate Behavioral Research*, *27*(2), 269–300.

Burke, L. A., & Hutchins, H. M. (2007). Training Transfer: An Integrative Literature Review. *Human Resource Development Review*, *6*(3), 263–296.

Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. L., Van der Kaap-Deeder, J., Duriez, B., Lens, W., Matos, L., Mouratidis, A., Ryan, R. M., Sheldon, K. M., Soenens, B., Van Petegem, S., & Verstuyf, J. (2015). Basic psychological need satisfaction, need frustration, and need strength across four cultures. *Motivation and Emotion*, *39*(2), 216–236.

Chen, F. F. (2007). Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, *14*(3), 464–504.

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, *9*(2), 233–255.

Curado, C., Henriques, P. L., & Ribeiro, S. (2015). Voluntary or mandatory enrollment in training and the motivation to transfer training: Motivation to transfer training. *International Journal of Training and Development*, *19*(2), 98–109.

Deci, E. L., & Ryan, R. M. (2000). The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychological Inquiry*, *11*(4), 227–268.

Deci, E. L., & Ryan, R. M. (2012). Self-Determination Theory. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins, *Handbook of Theories of Social Psychology: Volume 1* (pp. 416–436). Sage Publications Ltd.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, *86*(3), 499–512.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment*, *49*(1), 71–75.

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving Students' Learning With Effective Learning Techniques: Promising Directions From Cognitive and Educational Psychology. *Psychological Science in the Public Interest*, *14*(1), 4–58.

Dweck, C. S. (1986). Motivational Processes Affecting Learning. *American Psychologist*, *41*(10), 1040–1048.

Finkel, S. E. (1995). *Causal analysis with panel data* (Vol. 105). SAGE University Paper Series on Quantitative Applications in the Social Sciences (Vol. 105). Beverly Hills, CA: Sage Publications.

Ford, J. K. (2020). *Learning in Organizations: An Evidence-Based Approach*. Routledge.

Ford, J. K., Baldwin, T. T., & Prasad, J. (2018). Transfer of Training: The Known and the Unknown. *Annual Review of Organizational Psychology and Organizational Behavior*, *5*(1), 201–225.

Ford, J. K., Bhatia, S., & Yelon, S. L. (2019). Beyond Direct Application as an Indicator of Transfer: A Demonstration of Five Types of Use. *Performance Improvement Quarterly*, *32*(2),

Fouquereau, E., & Rioux, L. (2002). L laboration de l'l chelle de satisfaction de vie professionnelle (I SVP) en langue fran aise • une d6marche exploratoire. *Canadian Journal of Behavioural Science*, *34*(3), 210–215.

Fox, J., & Weisberg, S. (2011). *An R companion to applied regression* (2nd ed.). Sage publications.

Garavan, T., McCarthy, A., Lai, Y., Murphy, K., Sheehan, M., & Carbery, R. (2020). Training and organisational performance: A meta-analysis of temporal, institutional, and organisational context moderators. *Human Resource Management Journal*, 1748-8583.12284.

Gegenfurtner, A. (2011). Motivation and transfer in professional training: A meta-analysis of the moderating effects of knowledge type, instruction, and assessment conditions. *Educational Research Review*, *6*(3), 153–168.

Gegenfurtner, A., Könings, K. D., Kosmajac, N., & Gebhardt, M. (2016). Voluntary or mandatory training participation as a moderator in the relationship between goal orientations and transfer of training: Voluntary or mandatory training participation. *International Journal of Training and Development*, *20*(4), 290–301.

Gegenfurtner, A., Veermans, K., Festner, D., & Gruber, H. (2009). Integrative Literature Review: Motivation to Transfer Training: An Integrative Literature Review. *Human Resource Development Review*, *8*(3), 403–423.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). *Multivariate data analysis* (Eighth edition). Cengage.

Halbesleben, J. R. B. (2010). A meta-analysis of work engagement: Relationships with burnout, demands, resources, and consequences. In A. B. Bakker & M. P. Leiter (Eds.), *Work*

Engagement: A Handbook of Essential Theory and Research (pp. 102-117). Psychology Press.

Hardre, P. L., & Reeve, J. (2003). A motivational model of rural students' intentions to persist in, versus drop out of, high school. *Journal of Educational Psychology*, *95*(2), 347–356.

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, *44*(3), 513–524.

Hobfoll, S. E., Halbesleben, J., Neveu, J.-P., & Westman, M. (2018). Conservation of Resources in the Organizational Context: The Reality of Resources and Their Consequences. *Annual Review of Organizational Psychology and Organizational Behavior*, *5*(1), 103–128.

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

Huang, J. L., Blume, B. D., Ford, J. K., & Baldwin, T. T. (2015). A Tale of Two Transfers: Disentangling Maximum and Typical Transfer and Their Respective Predictors. *Journal of Business and Psychology*, *30*(4), 709–732.

Huang, J. L., Ford, J. K., & Ryan, A. M. (2017). Ignored no more: Within-person variability enables better understanding of training transfer. *Personnel Psychology*, *70*(3), 557-596.

Hughes, A. M., Zajac, S., Spencer, J. M., & Salas, E. (2018). A checklist for facilitating training transfer in organizations: A checklist for facilitating training transfer in organizations. *International Journal of Training and Development*, *22*(4), 334–345.

Hughes, A. M., Zajac, S., Woods, A. L., & Salas, E. (2020). The Role of Work Environment in Training Sustainment: A Meta-Analysis. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, *62*(1), 166–183.

Keith, N., & Frese, M. (2008). Effectiveness of error management training: A meta-analysis. *Journal of Applied Psychology*, *93*(1), 59–69.

Kenny, D. A., & Judd, C. M. (1984). Estimating the Nonlinear and Interactive Effects of Latent Variables. *Psychological Bulletin*, *96*(1), 201–210.

Kraiger, K., & Ford, J. K. (2021). The Science of Workplace Instruction: Learning and Development Applied to Work. *Annual Review of Organizational Psychology and Organizational Behavior*, *8*(1), 45–72.

Kraiger, K., Ford, J. K., & Salas, E. (1993). Application of cognitive, skill-based, and affective theories of learning outcomes to new methods of training evaluation. *Journal of Applied Psychology*, *78*(2), 311–328.

Lacerenza, C. N., Reyes, D. L., Marlow, S. L., Joseph, D. L., & Salas, E. (2017). Leadership training design, delivery, and implementation: A meta-analysis. *Journal of Applied Psychology*, *102*(12), 1686–1718.

Laker, D. R., & Powell, J. L. (2011). The differences between hard and soft skills and their relative impact on training transfer. *Human Resource Development Quarterly*, *22*(1),

Lin, G.-C., Wen, Z., Marsh, H., & Lin, H.-S. (2010). Structural Equation Models of Latent Interactions: Clarification of Orthogonalizing and Double-Mean-Centering Strategies. *Structural Equation Modeling: A Multidisciplinary Journal*, *17*(3), 374–391.

Long, J. S., & Ervin, L. H. (2000). Using Heteroscedasticity Consistent Standard Errors in the Linear Regression Model. *The American Statistician*, *54*(3), 217–224.

Machin, M. A., & Treloar, C. A. (2004). Predictors of motivation to learn when training is mandatory. *Proceedings of the 39th Australian Psychological Society Annual Conference: Psychological Science in Action*, 157–161.

Marsh, H. W., Hau, K.-T., & Grayson, D. (2005). Goodness of Fit in Structural Equation Models. In J. J. McArdle & A. Maydeu-Olivares (Eds.), *Multivariate applications book series. Contemporary psychometrics: A festschrift for Roderick P. McDonald* (pp. 275–340). Lawrence Erlbaum Associates Publishers.

Martos T., Sallay V., Désfalvi J., Szabó T., & Ittzés A. (2014). Psychometric characteristics of the Hungarian version of the Satisfaction with Life Scale (SWLS-H). *Mentálhigiéné és Pszichoszomatika*, *15*(3), 289–303.

Mathieu, J., Tannenbaum, S. I., & Salas, E. (1992). Influences of individual and situational characteristics on measures of training effectiveness. *Academy of Management Journal*, *35*(4), 828–847.

Mauno, S., Kinnunen, U., & Ruokolainen, M. (2007). Job demands and resources as antecedents of work engagement: A longitudinal study. *Journal of Vocational Behavior*, *70*(1), 149–171.

McDonald, R. P. (1970). The theoretical foundations of principal factor analysis, canonical factor analysis, and alpha factor analysis. *British Journal of Mathematical and Statistical Psychology*, *23*(1), 1–21.

Meredith, W. (1993). Measurement invariance, factor analysis and factorial invariance. *Psychometrika*, *58*(4), 525–543.

Michie, S. F., West, R., Campbell, R., Brown, J., & Gainforth, H. (2014). *ABC of behaviour change theories*. Silverback publishing.

Miller, L., Mandzuk, C., Frankel, D., McDonald, A., & Bellow, B. (2013). *2013 State of the Industry*. Alexandria, VA: American Society for Training and Development.

Millsap, R. E. (2011). *Statistical approaches to measurement invariance*. Routledge.

Morin, A. J. S., Arens, A. K., & Marsh, H. W. (2016). A Bifactor Exploratory Structural Equation Modeling Framework for the Identification of Distinct Sources of Construct-Relevant Psychometric Multidimensionality. *Structural Equation Modeling: A Multidisciplinary Journal*, *23*(1), 116–139.

Morin, A. J. S., Myers, N. D., & Lee, S. (2020). Modern factor analytic techniques: Bifactor models, exploratory structural equation modeling (ESEM) and bifactor-ESEM. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of Sport Psychology* (pp. 1044-1073). Wiley.

Muthén, L. K., & Muthén, B. O. (1998). *Mplus User's Guide. Eighth Edition.* Los Angeles, CA: Muthén & Muthén. https://www.statmodel.com/html_ug.shtml

Nijman, D.-J., & Gelissen, J. (2011). Direct and Indirect Effects of Supervisor Support on Transfer of Training. In R. F. Poell & M. van Woerkom (Eds.), *Supporting Workplace Learning* (pp. 89–106). Springer Netherlands.

Noe, R. A. (1986). Trainees' Attributes and Attitudes: Neglected Influences on Training Effectiveness. *Academy of Management Review*, *11*(4), 736–749.

Noe, R. A., & Schmitt, N. (1986). The influence of trainee attitudes on training effectiveness: Test of a model. *Personnel Psychology*, *39*(3), 497–523.

Noe, R. A., & Tews, M. J. (2012). Realigning Training and Development Research to Contribute to the Psychology of Competitive Advantage. *Industrial and Organizational Psychology*, *5*(1), 101–104.

Orosz, G., Dombi, E., Andreassen, C. S., Griffiths, M. D., & Demetrovics, Z. (2016). Analyzing Models of Work Addiction: Single Factor and Bi-Factor Models of the Bergen Work Addiction Scale. *International Journal of Mental Health and Addiction*, *14*(5), 662–671.

Pekrun, R., Murayama, K., Marsh, H. W., Goetz, T., & Frenzel, A. C. (2019). Happy fish in little ponds: Testing a reference group model of achievement and emotion. *Journal of Personality and Social Psychology, 117*(1), 166–185.

Perreira, T. A., Morin, A. J. S., Hebert, M., Gillet, N., Houle, S. A., & Berta, W. (2018). The short form of the Workplace Affective Commitment Multidimensional Questionnaire (WACMQ-S): A bifactor-ESEM approach among healthcare professionals. *Journal of Vocational Behavior, 106*, 62–83.

Plott, B. M., McDermott, P. L., Archer, S., Carolan, T. F., Hutchins, S., Fisher, A., Gronowski, M., Wickens, C. D., & Orvis, K. A. (2014). *Understanding the Impact of Training on Performance:* (Technical Report 1341). U.S. Army Research Institute for the Behavioral and Social Sciences.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879–891.

R Core Team. (2020). *R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria*. https://www.R-project.org/

Raykov, T., & Penev, S. (1998). Nested structural equation models: Noncentrality and power of restriction test. *Structural Equation Modeling: A Multidisciplinary Journal*, *5*(3), 229–246.

Reio, T. G. (2020). Competitive advantage and HRD. *Human Resource Development Quarterly, 31*(4), 353–354.

Reynolds, K. J., Turner, J. C., Branscombe, N. R., Mavor, K. I., Bizumic, B., & Subašić, E. (2010). Interactionism in personality and social psychology: An integrated approach to understanding the mind and behaviour. *European Journal of Personality, 24*(5), 458-482.

Roediger, H. L., & Butler, A. C. (2011). The critical role of retrieval practice in long-term retention. *Trends in Cognitive Sciences, 15*(1), 20–27.

Rosen, C. C., Ferris, D. L., Brown, D. J., Chen, Y., & Yan, M. (2014). Perceptions of Organizational Politics: A Need Satisfaction Paradigm. *Organization Science, 25*(4), 1026–1055.

Rosseel, Y. (2012). lavaan: An R Package for Structural Equation Modeling. *Journal of Statistical Software, 48*(2), 1-36.

Rouiller, J. Z., & Goldstein, I. L. (1993). The relationship between organizational transfer climate and positive transfer of training. *Human Resource Development Quarterly, 4*(4), 377–390.

Ryan, R. M., & Deci, E. L. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist, 55*(1), 68–78.

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press.

Saks, A. M. (2002). *So what is a good transfer of training estimate? A reply to Fitzpatrick* [Data set]. American Psychological Association.

Salamon, J., Blume, B. D., Orosz, G., & Nagy, T. (2021). The interplay between the level of voluntary participation and supervisor support. *Human Resource Development Quarterly, 32*(4), 459-481.

Salamon, J., Blume, B. D., Orosz, G., & Nagy, T. (2022). The Moderating Effect of Coworkers' Training Participation on the Influence of Peer Support in the Transfer Process. *European Journal of Training and Development*. Advance online publication.

Salamon, J., Blume, B. D., Tóth-Király, I., Nagy, T., & Orosz, G. (2022). The Positive Gain Spiral of Job Resources, Work Engagement, Opportunity, and Motivation on Training Transfer. *International Journal of Training and Development*. Advance online publication.

Salamon, J., Tóth-Király, I., Bőthe, B., Nagy, T., & Orosz, G. (2021). Having the Cake and Eating It Too: First-Order, Second-Order and Bifactor Representations of Work Engagement. *Frontiers in Psychology*, 3030.

Salancik, G. R., & Pfeffer, J. (1978). A Social Information Processing Approach to Job Attitudes and Task Design. *Administrative Science Quarterly*, *23*(2), 224.

Salas, E., Tannenbaum, S. I., Kraiger, K., & Smith-Jentsch, K. A. (2012). The science of training and development in organizations: What matters in practice. *Psychological Science in the Public Interest*, *13*, 74–101.

Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement*, *66*(4), 701–716.

Sonnentag, S. (2003). Recovery, work engagement, and proactive behavior: A new look at the interface between nonwork and work. *Journal of Applied Psychology*, *88*(3), 518–528.

Spector, P. E. (2019). Do Not Cross Me: Optimizing the Use of Cross-Sectional Designs. *Journal of Business and Psychology*, *34*(2), 125–137.

Tannenbaum, S. I., Mathieu, J. E., Salas, E., & Cannon-Bowers, J. A. (1991). Meeting trainees' expectations: The influence of training fulfillment on the development of commitment, self-efficacy, and motivation. *Journal of Applied Psychology*, *76*(6), 759–769.

Taylor, P. J., Russ-Eft, D. F., & Chan, D. W. L. (2005). A Meta-Analytic Review of Behavior Modeling Training. *Journal of Applied Psychology*, *90*(4), 692–709.

Tesluk, P. E., Farr, J. L., Mathieu, J. E., & Vance, R. J. (1995). Generalization of employee involvement training to the job setting: Individual and situational effects. *Personnel Psychology*, *48*(3), 607–632.

Tóth-Király, I., Morin, A. J. S., Bőthe, B., Orosz, G., & Rigó, A. (2018). Investigating the Multidimensionality of Need Fulfillment: A Bifactor Exploratory Structural Equation Modeling Representation. *Structural Equation Modeling: A Multidisciplinary Journal*, *25*(2), 267–286.

Tóth-Király, I., Morin, A. J. S., Bőthe, B., Rigó, A., & Orosz, G. (2021). Toward an Improved Understanding of Work Motivation Profiles. *Applied Psychology*, *70*(3), 986–1017.

Trépanier, S.-G., Fernet, C., Austin, S., Forest, J., & Vallerand, R. J. (2014). Linking job demands and resources to burnout and work engagement: Does passion underlie these differential relationships? *Motivation and Emotion*, *38*(3), 353–366.

Vallerand, R. J., Fortier, M. S., & Guay, F. (1997). Self-Determination and Persistence in a Real-Life Setting: Toward a Motivational Model of High School Dropout. *Journal of Personality and Social Psychology*, *72*(5), 1161–1176.

van der Locht, M., van Dam, K., & Chiaburu, D. S. (2013). Getting the most of management training: The role of identical elements for training transfer. *Personnel Review*, *42*(4), 422–439.

Warr, P., Allan, C., & Birdi, K. (1999). Predicting three levels of training outcome. *Journal of Occupational and Organizational Psychology*, *72*(3), 351–375.

Wickens, C. D., Hutchins, S., Carolan, T., & Cumming, J. (2013). Effectiveness of Part-Task Training and Increasing-Difficulty Training Strategies: A Meta-Analysis Approach.

Human Factors: The Journal of the Human Factors and Ergonomics Society, *55*(2), 461–470.

Wickham, H., Averick, M., Bryan, J., Chang, W., McGowan, L., François, R., Grolemund, G., Hayes, A., Henry, L., Hester, J., Kuhn, M., Pedersen, T., Miller, E., Bache, S., Müller, K., Ooms, J., Robinson, D., Seidel, D., Spinu, V., … Yutani, H. (2019). Welcome to the Tidyverse. *Journal of Open Source Software*, *4*(43), 1686.

Yelon, S. L., & Ford, J. K. (1999). Pursuing a Multidimensional View of Transfer. *Performance Improvement Quarterly*, *12*(3), 55–78.

Yelon, S. L., Ford, J. K., & Bhatia, S. (2014). How Trainees Transfer What They Have Learned: Toward a Taxonomy of Use. *Performance Improvement Quarterly*, *27*(3), 27–52.

Yzerbyt, V., Muller, D., Batailler, C., & Judd, C. M. (2018). New Recommendations for Testing Indirect Effects in Mediational Models: The Need to Report and Test Component Paths. *Journal of Personality and Social Psychology: Attitudes and Social Cognition*, *115*(6), 929–943.

IX. LIST OF PUBLICATIONS THAT THE DISSERTATION IS BASED UPON

Salamon, J., Blume, B. D., Orosz, G., & Nagy, T. (2021). The interplay between the level of voluntary participation and supervisor support. *Human Resource Development Quarterly*, *32*(4), 459-481. https://doi.org/10.1002/hrdq.21428

Salamon, J., Blume, B. D., Orosz, G., & Nagy, T. (2022). The Moderating Effect of Coworkers' Training Participation on the Influence of Peer Support in the Transfer Process. *European Journal of Training and Development*. Advance online publication. https://doi.org/10.1108/EJTD-07-2021-0102

Salamon, J., Tóth-Király, I., Bőthe, B., Nagy, T., & Orosz, G. (2021). Having the Cake and Eating It Too: First-Order, Second-Order and Bifactor Representations of Work Engagement. *Frontiers in Psychology*, 3030. https://doi.org/10.3389/fpsyg.2021.615581

Salamon, J., Blume, B. D., Tóth-Király, I., Nagy, T., & Orosz, G. (2022). The Positive Gain Spiral of Job Resources, Work Engagement, Opportunity, and Motivation on Training Transfer. *International Journal of Training and Development.* Advance online publication. https://doi.org/10.1111/ijtd.12277

Total impact factor of the published studies: 12.323

Note: Each co-author has granted permission for the given publication to be included in the current dissertation.

X. LIST OF PUBLICATIONS DIRECTLY NOT USED IN THE DISSERTATION

X/1. PEER REVIEWED SCIENTIFIC PAPERS

International:

Ebersole, C. R., Mathur, M. B., Baranski, E., Bart-Plange, D., Buttrick, N. R., Chartier, C. R., …, **Salamon, J.**, … & Nosek, B. A. (2020). Many Labs 5: Testing pre-data collection peer review as an intervention to increase replicability. *Advances in Methods and Practices in Psychological Science*, *3*(3), 309-331.

Mathur, M.B., Bart-Plange, D.J., Aczel, B., Bernstein, M.H., Ciunci, A., Ebersole, C.R., …, **Salamon, J.**, … & Frank, M.C. (2020). Many Labs 5: Registered multisite replication of tempting-fate effects in Risen & Gilovich (2008). *Advances in Methods and Practices in Psychological Science*, *3*(3), 394-404.

O'Donnell, M., Nelson, Leif D., Ackermann, E., Aczel, B., Akhtar, A., Aldrovandi, S., …, **Salamon, J.**, … & Zrubka, M. (2018). Registered Replication Report: Dijksterhuis and van Knippenberg (1998). *Perspectives on Psychological Science*, *13*(2), 268-294.

Skorb, L., Aczel, B., Bakos, B., Christ, O., Fedor, A., Feinberg, L., …, **Salamon, J.**, … & Hartshorne, J. K. (2020). Many Labs 5: Replication Report for Van Dijk, Van Kleef, Steinel, & Van Beest (2008). A social functional approach to emotions in bargaining: When communicating anger pays and when it backfires. *Advances in Methods and Practices in Psychological Science*, *3*(3), 418-428.

Hungarian:

Orosz, G., Jánvári, M., **Salamon, J.** (2012). Csalás és versengés a felsőoktatásban. *Pszichológia*, *32*(2), 153–171.

Orosz, G., **Salamon, J.**, Makkai, A., Turcsik, Á. B. (2013). Konstruktív versengés az autópiaci szervezetekben. *Alkalmazott pszichológia*, *15*(2), 5–32.

X/2. CONFERENCE PRESENTATIONS AND POSTERS

International:

Salamon, J., Tóth-Király, I., Nagy, T., & Orosz, G. (2020, June 1–September 1). Soft Skill Development in Multinational Companies – Supportive Factors of Training Transfer [Conference presentation]. APS Poster Showcase, Chicago, IL, United States.

Szaszi, B., Palinkas, A., Palfi, B., Szollosi, A., **Salamon, J.**, & Aczel, B. (2017, June 23-24). What Holds Us Back from Finding the Successful Nudge Formula? – A Domain-General Scoping Review. Poster session, presented at the WINK – The Nudge Conference 2017, Utrecht, Netherlands.

Hungarian:

Salamon, J., & Krasz, K. (2016, Június 2-4.). *A szervezeten belüli tudásmegosztási hajlandóság vizsgálata.* Múlt és jelen összeér. A Magyar Pszichológiai Társaság XXV. Országos Tudományos Nagygyűlése. Budapest, Hungary.

Orosz, G., **Salamon, J.**, Makkai, A., Turcsik, Á.B., & Fülöp, M. (2011, Május 25-27). *Mitől válik konstruktívvá a versengés az autópiaci szervezetekben?* Hagyomány és megújulás. A Magyar Pszichológiai Társaság Jubileumi XX. Országos Nagygyűlése. Budapest, Hungary.

Jánvári, M., & **Salamon, J.** (2011, Április 7-9). *Csalás és versengés a felsőoktatásban.* XXX. Jubileumi OTDK, Kecskemét, Hungary.

Salamon, J., Makkai, A., & Turcsik Á.B. (2011, Április 7-9). *Együtt nevetni és keményen dolgozni versengés közben: A konstruktív versengés tényezői szervezeteken belül.* XXX. Jubileumi OTDK, Kecskemét, Hungary.

Jánvári, M., & **Salamon, J.** (2010, November 26-28). *Versengés és csalás a felsőoktatásban.* 9. Vajdasági Magyar Tudományos Diákköri Konferencia. Újvidék/Novi Sad, Serbia.