DOCTORAL DISSERTATION

JÁNOS SALAMON

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

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EÖTVÖS LORÁND UNIVERSITY

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II. Nyilatkozatok

1. A doktori értekezés szerzőjeként[2]

a) hozzájárulok, hogy a doktori fokozat megszerzését követően a doktori értekezésem és a tézisek nyilvánosságra kerüljenek az ELTE Digitális Intézményi Tudástárban. Felhatalmazom a Pszichológiai Doktori Iskola hivatalának ügyintézőjét Barna Ildikót, hogy az értekezést és a téziseket feltöltse az ELTE Digitális Intézményi Tudástárba, és ennek során kitöltse a feltöltéshez szükséges nyilatkozatokat.

b) kérem, hogy a mellékelt kérelemben részletezett szabadalmi, illetőleg oltalmi bejelentés közzétételéig a doktori értekezést ne bocsássák nyilvánosságra az Egyetemi Könyvtárban és az ELTE Digitális Intézményi Tudástárban;[3]

c) kérem, hogy a nemzetbiztonsági okból minősített adatot tartalmazó doktori értekezést a minősítés (…….*dátum*)-ig tartó időtartama alatt ne bocsássák nyilvánosságra az Egyetemi Könyvtárban és az ELTE Digitális Intézményi Tudástárban;[4]

d) kérem, hogy a mű kiadására vonatkozó mellékelt kiadó szerződésre tekintettel a doktori értekezést a könyv megjelenéséig ne bocsássák nyilvánosságra az Egyetemi Könyvtárban,

[1] A kari hivatal ügyintézője tölti ki.

[2] A megfelelő szöveg aláhúzandó.

[3] A doktori értekezés benyújtásával egyidejűleg be kell adni a tudományági doktori tanácshoz a szabadalmi, illetőleg oltalmi bejelentést tanúsító okiratot és a nyilvánosságra hozatal elhalasztása iránti kérelmet.

[4] A doktori értekezés benyújtásával egyidejűleg be kell nyújtani a minősített adatra vonatkozó közokiratot.

és az ELTE Digitális Intézményi Tudástárban csak a könyv bibliográfiai adatait tegyék közzé. Ha a könyv a fokozatszerzést követőn egy évig nem jelenik meg, hozzájárulok, hogy a doktori értekezésem és a tézisek nyilvánosságra kerüljenek az Egyetemi Könyvtárban és az ELTE Digitális Intézményi Tudástárban.[5]

2. A doktori értekezés szerzőjeként kijelentem, hogy
a) a ELTE Digitális Intézményi Tudástárba feltöltendő doktori értekezés és a tézisek saját eredeti, önálló szellemi munkám és legjobb tudomásom szerint nem sértem vele senki szerzői jogait;
b) a doktori értekezés és a tézisek nyomtatott változatai és az elektronikus adathordozón benyújtott tartalmak (szöveg és ábrák) mindenben megegyeznek.

3. A doktori értekezés szerzőjeként hozzájárulok a doktori értekezés és a tézisek szövegének plágiumkereső adatbázisba helyezéséhez és plágiumellenőrző vizsgálatok lefuttatásához.

Kelt: Budapest, 2022. 08. 24.

a doktori értekezés szerzőjének aláírása

[5] A doktori értekezés benyújtásával egyidejűleg be kell nyújtani a mű kiadásáról szóló kiadói szerződést.

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My highly vague childhood desire for a PhD degree and the —much more tangible— supportive family background were some of the important initial resources that I needed to pursue a scientific degree. I was also fortunate to arrive in a great community as an undergrad student. This community included smart and curious peers and supportive mentors dedicated to conducting high-quality scientific work and transferring their knowledge and enthusiasm to their students. Although my childhood desires faded long ago, my interest in a scientific career was re-kindled early in my undergraduate studies when *Miriam Jánvári* invited me to conduct research together. To this day, I am highly grateful for her invitation and all the work we have done together. At the beginning of our collaboration with Miriam, we met *Gábor Orosz*, who agreed to support Miriam's and my research project. Initially, Gabor began as a mentor—however, over time he became our friend, too, and he later went on to become one of the supervisors of our PhD studies. For the roles he played in my life, I am intensely grateful. It is to him I owe thanks for allowing me to take the first steps in my scientific career.

My interest directed me to the applied field of organizational psychology, where I sought out a topic of research that could both hold my interest and hold value to science and business organizations. While searching for my PhD topic-to-be, I gained experience in energy, consulting, and IT sectors, from small businesses to large multinational companies. During these years, *Kitti Venesz*, *Balázs Aczél*, *Gergely Németh*, *Attila Bodnár*, *Levente Szabados*, *Gergely Szertics*, *Zoltán Demendy*, and *Péter Szabó* provided me with support, opportunities, and inspiration that led me to discover the seeds of my research.

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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

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I. INTRODUCTION

Career competences play a key role in employee job market value and career progress. They are defined as "knowledge, skills, and abilities central to career development, which can be influenced and developed by the individual" (Akkermans et al., 2013, p. 246). Similarly, 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. In the past decade, job skills and requirements have been changing rapidly due to digitalization, automation, and application of artificial intelligence (e.g., Bughin et al., 2018; Iansiti & Lakhani, 2020; International Labour Organization, 2019; Manyika et al., 2017). Although these changes directly imply an increasing demand for technology related skills, there is also a demand for soft skills (e.g., leading, negotiating, collaborating, selling, communicating complex ideas), which are strongly required even in technical jobs (Börner et al., 2018).

To ensure employability, and to maintain the competitive advantage, employees and managers are often required to train themselves and develop additional skills (Noe & Tews, 2012; Reio, 2020). For example, leadership development programs often target strategic leadership skills such as the ability to anticipate (e.g., Schoemaker & Krupp, 2015) or scenario planning (e.g., James & Wooten, 2011), skills that allow managers to scan the environment and collect information outside the core business to recognize potential external threats and future opportunities. It is estimated that most of the learning occurs in organizations informally (c.f., Bear et al., 2008). For example, on-the-job, informal field-based learning can occur by experimentation (executing current tasks differently or seeking new assignments), through self-reflection or feedback from others (e.g., actively seeking advice), or by learning from others (e.g., observing their behavior or talking with them about work) (Wolfson et al., 2018). Beyond the natural occurrence of these informal learning interactions, organizations can provide some structures and support to enhance their effectiveness. For example, one type of these approaches is guided learning, that can occur in the form of one-on-one coaching for leaders, mentoring from supervisors or peers, or also as an on-the-job training for newcomers who are paired with an experienced coworker to observe and learn from them (Ford, 2020). Organizations also utilize developmental job experiences for improving knowledge and skills of their workforce. These activities place

individuals in new job situations that require individuals to learn and apply new or enhanced knowledge and skills (Ford, 2020). Furthermore, by building a learning culture –where continuous learning opportunities are created, leaders champion and support learning, experimentation is encouraged, collaboration and knowledge sharing are valued and rewarded (Marsick & Watkins, 2003)– self-directed learning (i.e., individuals voluntarily take actions to identify their learning needs and proactively seek developmental opportunities to improve their knowledge and skills) can be strengthened (Ford, 2020; for further information about self-directed learning practices, see also Lemmetty & Collin, 2020).

Although these above-mentioned practices are undoubtedly important for ensuring learning and skill development in organizations, traditionally learning at work was associated with formal, (usually) off-the-job training (Ford, 2020). The formal –and maybe more controllable– 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 they 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 skills with 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 does not only lead to a simple return on investment, but also to additional 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 of training programs may not manifest, and dedicated financial and time resources may be spent in vain. According to the estimation provided by 150 members of a training and development society, 62% of participants transfer training immediately after the program, 44% six months after, and only 34% use learned skills on the job one year after attending training (Saks, 2002). Furthermore, only approximately 51% of training investments result in a positive behavior change and performance improvement (Saks, 2002).

In fact, these numbers are based on estimates instead of observed behavioral measures of transfer, and the generalization of a complex phenomenon like training transfer into a single percentage is unrealistic (Ford et al., 2011). However, they used to raise attention to the importance of the transfer problem and to the potential for having a better return on the enormous investment organizations spend on employee training and education (Ford et al., 2018).

The training transfer literature already identified some of the key factors of successful training transfer (c.f. Ford et al., 2018; Kraiger & Ford, 2021). In the next chapter, we attempt to review these factors and introduce them by the elements of the widely used organizing framework of Baldwin and Ford (1988). At the beginning of the next chapter, the different conditions and types of training transfer and the main training outcomes are summarized. The following part of the next chapter introduces the three main pillars that are necessary for successful training transfer, namely the training design characteristics including the main learning principles, the individual characteristics, and the work-environmental characteristics. The transfer literature investigated the role of several variables that are related to these three main pillars. In the next chapter, only those variables are presented which were identified by reviews and meta-analyses as essential factors for successful training transfer. 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 aim of the present dissertation is to build on the existing knowledge in the training transfer field, and further improve it by investigating new elements and interactions that might boost training transfer's efficiency. For this reason, in *Study 1* we investigate the potential reason for the previously conflicting findings regarding the best attendance policy that can lead to the most beneficial outcomes. The study highlights the interplay between the level of voluntary participation and supervisor support. *Study 2* is primarily focusing on whether and how coworkers' training participation can influence the well-known positive effect of peer support on the transfer process. *Study 3* is focusing on a more general work-related topic, namely work engagement. It validates the Hungarian version of the Utrecht Work Engagement Scale and investigates a potentially better alternative to the ongoing

scientific debate about whether work engagement is experienced as a global construct, or as its three components. Although it is not directly related to the training transfer literature, it provides an important preparation for the final paper in the present dissertation. In *Study 4*, we aimed to investigate whether and how job resources and job demands could influence the training transfer process through work engagement. The primary aim of this paper was to investigate the potential influence of the broader work environment and work-related attitudes on the most important predictors of training transfer. These targeted factors and their interactions are introduced in more detail at the end of the following chapter, after the general overview of the training transfer literature.

II. OVERVIEW OF THE TRAINING TRANSFER LITERATURE

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 factor of transfer conditions, refers to the extent of knowledge, skills, behavior, or attitude retention after the completion of the training program.

The second main part of the transfer model is the training outcomes which can be defined as "the amount of original learning that occurs during the training program and the retention of that material after the program is completed" (Baldwin & Ford, 1988, p. 64). The third main part of the model contains the training-input factors which also differentiates three main categories, including training design characteristics, trainee characteristics, and work-environment characteristics. This early review and its general framework became the basis of the transfer research for the upcoming decades which provided further evidence for the influential training-input factors.

This chapter provides a detailed introduction of the theoretical background and empirical findings related to the elements of the training transfer framework. First, the two conditions of transfer are explained in more detail with the extension of the other types of

use. The second part of this chapter introduces the cognitive, affective, and skill-based learning outcomes that can be considered in training transfer studies. Third, those factors of the three main training input categories (i.e., training design, individuals, and work-environment) are introduced which impact on training transfer are empirically supported. Finally, the Dynamic Transfer Model (Blume et al., 2019) is presented that describes the linkages of these elements in the transfer process.

II/1. TRANSFER OF TRAINING

Generalization and maintenance of knowledge, skills, and attitude are two conditions of transfer (Baldwin and Ford, 1988). On the one hand, the generalization of learning outcomes can be minimal when the learned skills are applied in exactly the same types of conditions (settings, situations, people) presented in the learning activity. On the other hand, the generalization can be extensive when there is a wide range of job conditions and situations where the application of learning outcomes is appropriate. In the latter case, training professionals are responsible for providing clear information and instruction about how often and in what situations the learners could be expected to effectively apply the learned knowledge, skills, or attitudes (Ford, 2020).

Maintenance, the second condition of transfer, is related to the retention of acquired knowledge, skills, and attitudes over time. When these are not used for an extended period of time (e.g., due to infrequent opportunities to practice and apply, or to the absent or inadequate feedback), knowledge and skills become substantially deteriorated (Arthur et al., 1998). Moreover, the maintenance of the learning outcomes can be unbalanced regarding the same training programs. It is likely that 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 for some part of the acquired skills, and results in deterioration of others (Ford, 2020). These differences can influence long-term performance improvements and should be considered when programs are organized for reinforce or support relearning of necessary parts of the targeted skills.

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).

Beyond the direct application of acquired knowledge, skills, and attitudes, qualitative and quantitative studies (e.g., Ford et al., 2019; Yelon et al., 2014) suggest that there are other ways of transfer that could be considered when investigating the success of training. These studies indicate that although basically the (1) *transfer-as-use* approach is applied in transfer research, there are four other types of use that could be considered as transfer of training. (2) Trainees also can transfer learned knowledge and skills by *evaluating* their and others' performance based on learned standards they acquired in the training. (3) They can also *explain* a new concept or principle to others who did not participate in the training. Furthermore, (4) they can *instruct*, or teach others who did not attend the training on how to apply the targeted methods and principles. Finally, (5) former trainees (who are members or leaders of a workgroup) can also *lead* others and promote successful application of targeted skills by expecting them to apply the skills and reminding them what to do (Yelon et al., 2014).

II/2. TRAINING OUTCOMES

In prior transfer models, training outcomes (or learning outcomes) were proposed as mediating variables between predictive factors (e.g., trainee, training design, and work environment characteristics) and the transfer of training (Baldwin & Ford, 1988; Noe, 1986; Tannenbaum et al., 1991). Accordingly, the aim of training evaluation is primarily to answer the main questions related to training and development programs: whether training participants sufficiently acquired targeted knowledge, skills, and attitudes (reflecting learning issues), and whether these led to improved performance on the job (reflecting transfer issues) (Kraiger et al., 1993). 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. In their proposed taxonomy, they categorized verbal knowledge, knowledge organization and cognitive strategies among *cognitive learning outcomes*. *Skill-based outcomes* include the

execution of trained skills (Huang et al., 2015) and automaticity (i.e., "repeated responding to consistent stimuli" which uses single-step memory retrieval instead of effortful thinking and deliberation; Mazar & Wood, 2018, p. 15). *Affective outcomes* consist of attitudinal changes and changes in motivational components (e.g., motivational dispositions, self-efficacy, goal setting). As noted by Huang et al. (2015), in training research, declarative knowledge is usually assessed as cognitive outcome, posttraining 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 performance environment (i.e., the on-the-job environment where the targeted skills should be applied). Another type of training programs –in which the difference between learning context and real-life situations are larger, and in which the training objectives are focusing largely on learning principles– 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 which can affect their transfer success. One of the differences is related to the similarity between the learning context and the performance environment (as introduced above). They also argue that due to the less degree of complexities and variety of transfer situations, it is likely that the level of mastery that can be achieved in hard skill training is higher. Moreover, they assumed that the identification of training needs is more precise in case of hard skill development programs, and these programs increase self-efficacy of training participants more. These program types also require different methods of instructions, such as soft skill programs using more experimental methods (e.g., role playing, case studies), while hard skill programs are using more performance-based methods (e.g., on-the-job training).

Furthermore, according to Laker and Powell (2011), participants of soft skill training programs have a better chance to face more resistance to change. Participants may have their own resistance if their prior knowledge and experience (e.g., alternative ways of responding

in a situation led previously to acceptable outcomes) negatively interfere with learning and using the new skills. Furthermore, without an intervention targeting at the organizational level, there is a greater chance for an organizational resistance if participants attempt to apply learned skills of training programs dedicated to change existing and widely accepted norms, rules, procedures, or behaviors. The third source of resistance regarding the application of soft skill training programs can be fueled by the direct social environment. For example, although supervisors are expected to be role models, as they are (usually) unfamiliar with the specific training content, they may not behave according to the training.

In contrast, arguing Laker and Powell (2011), hard skill training programs are usually more likely to follow those changes in the environment that require skill development. Consequently, learning hard skills reduces uncertainty and anxiety in performing required tasks. Moreover, managers are usually not expected to apply the same hard skills so they less likely act as ineffective role models. Furthermore, the success of hard skill programs' application is usually measured by objective performance outcomes and standardized procedures, and the feedback whether (and which part of) the application was successful or not is usually immediate, specific, and clear. Contrary, as the success criteria of soft skill programs are more subjective, the complexity of feedback and consequences of appropriate application can vary, so these programs can probably require more support, reinforcement, and appreciation from the social environment (e.g., supervisors, peers). According to Laker and Powell (2011), these differences indicate that soft skill training programs are more exposed to barriers in their application, and it can be assumed that there are also differences in the factors influencing their transfer.

II/3. TRAINING DESIGN CHARACTERISTICS AND LEARNING PRINCIPLES

Many empirical studies investigated the training design elements (training methods, design characteristics, delivery methods) that can potentially increase learning, retention, and transfer. For example, among the major training design factors that are supported by empirical research, Baldwin and Ford (1988) mentioned the incorporation of learning principles, the sequencing of training material, and the job relevance of the training content. Evidence-based training design elements and learning principles that result better learning outcomes and transfer of training are summarized by previous reviews, books, and meta-

analyses (e.g., Arthur et al., 1998; Blume et al., 2010; Burke & Hutchins, 2007; Ford, 2020; Kraiger & Ford, 2021; Lacerenza et al., 2017).

II/3.1. Preparation for training design

Before designing a training program, it is necessary to analyze the training needs of the organization, the requirements of effective task performance, to identify who needs training and the specific gaps between individuals' current and desired knowledge, skills, and attitudes (Arthur et al., 2003). The systematic process that helps professionals to unfold these gaps and to determine whether training programs are the best interventions that could result in the desired outcomes is called *needs analysis* or *needs assessment* (Arthur et al., 2003; Ford, 2020).

A systematic needs assessment provides crucial information for the design, delivery, and assessment of a training program, thus for collecting all relevant information (e.g., current state, desired outcomes, potential enablers and barriers) to a proper and comprehensive analysis, it is advised to involve all stakeholders (such as organizational leaders, learning and development specialists, and job incumbents) into the process (Ford, 2020; Lacerenza et al., 2017). The results of the needs analysis inform intervention designers about the targeted purpose, goals, and learning objectives of the training which are the intended outcomes of the program and link them to the organizational priorities. Furthermore, the comprehensive needs analysis can ensure that the content covered by the training program will be relevant to the selected target group, as it is also identified in the process who needs to be trained, what they already know and what skill level they currently have (Ford, 2020; Hughes et al., 2018).

II/3.2. Learning principles: supporting knowledge acquisition

The science of learning identified several learning principles that received empirical evidence to have positive effects on retention and retrieval and which can be integrated into workplace training programs (Kraiger & Ford, 2021). One of the learning principles highlights the importance of *preparing learners* to acquire new knowledge. Employing advanced organizers (e.g., schematic representations, templates, concept maps, mnemonics – which used to introduce new concepts by building on the existing knowledge of the learner; Ford, 2020) before the new knowledge presented is a useful strategy to prepare learners for

acquiring new information. Another part of the preparation is related to the commitment building of all stakeholders (trainees, managers, coworkers). It can be achieved by communicating the impact of the program on them (both at individual, team and organizational levels) and by facilitating trainees to set personal goals for training by utilizing and personalizing learning objectives (Hughes et al., 2018; Salas et al., 2012).

Another learning principle is called *generative learning* which involves actively making connections between new information and learners' existing knowledge. Learning strategies such as integration strategy (e.g., generating personal examples; Gingerich et al., 2014), paraphrasing new information with their own words, creating analogies and metaphors require the learners to take an active role in the learning process. For more information on generative learning strategies and how to facilitate them, refer to Fiorella and Mayer (2016).

A third principle is called *interleaved practice,* which refers to a learning process where different problems, materials, or skills are mixed within a learning module (cf., Dunlosky et al., 2013). In the application of this learning principle, learners are required to identify the critical differences between the presented elements, which requires more intense attention and results in better understanding of the presented materials.

The next principle is focusing on the advantage of *retrieving information from memory*. Retrieval practice requires active recalling of information from memory which strengthen the connections in long-term memory (i.e., enhancing retention) and reveal the gaps in knowledge that support more focused and effective restudy (Roediger et al., 2011). Empirical findings show the superiority of tests over additional study of the materials in enhancing retention (also known as the testing effect; Roediger & Butler, 2011; Roediger & Karpicke, 2006; Rowland, 2014).

II/3.3. Learning Principles: supporting the application of learning

Probably one of the most important (and quite obvious) learning principle is reflecting on the need for opportunities to practice where learners can actively master the capability they learned (Ford, 2020). According to Ford (2020), there are too many learning opportunities where the focus is on a lot of content and discussion, without providing enough opportunity to actively practice the learned techniques. However, providing a variability of practice (across tasks, people, and situations) was found as an empirically supported

instructional principle (Kraiger & Ford, 2021). When learners continue practice on a task even after reaching a level of mastery, they apply the learning principle of *overlearning* (Baldwin & Ford, 1988). This process leads to strong retention results, and can also serve as a basis of automaticity, which refers to the routinization of performing a task easily and efficiently, while requiring limited attentional capacity (Burke & Hutchins, 2007; Ford, 2020; Kraiger & Ford, 2021). Nevertheless, the physical practice of learned skills is not the only option of improving application performance. Previous findings in sport, exercise, and medical training programs provide evidence that beyond the physical practice of learned skills, mental practice or imagery use can also improve performance (e.g., Arora et al., 2011; Cumming & Williams, 2012; Weinberg, 2008). Consequently, Ford (2020) suggests considering its utilization in workplace learning programs.

Training research provided evidence for the positive impact of applying *identical elements* (i.e., similarities in the environment, equipment, aims, methods, approaches, task complexities, task and environmental cues and consequences) in the learning environment and in the transfer settings, which leads to higher transfer motivation and transfer of training (e.g., van der Locht et al., 2013). Similarly, Lacerenza et al. (2017) found on-site leadership development programs (which ensure high psychological, equipment, and environment fidelity) are more effective in terms of organizational results compared to off-site programs, while they did not find differences between on-site and off-site programs regarding learning and transfer.

Another principle, the *distribution of practice over time* or *spaced practice* (i.e., providing multiple training sessions separated by time, instead of providing training in one, massed learning session) was also found as beneficial on long-term retention and successful transfer, and its impact received ample research support in educational and organizational settings (e.g., Donovan & Radosevich, 1999; Dunlosky et al., 2013; Ford et al., 2018; Lacerenza et al., 2017).

To optimize cognitive efforts that the learning requires and reduce cognitive overload, previous findings suggest sequencing of training materials (Kraiger & Ford, 2021). For example, Wickens et al. (2013) found in their meta-analysis that *adaptive difficulty* (where difficulty is adjusted to each learners' individual performance) leads to better training results compared to settings where difficulty was increased in fixed steps (uniformly) for all learners

and to constant difficulty conditions. Another related training method is called *scaffolding* (providing extensive assistance for learners in the early phases of instruction to lessen the demands of task performance, and incrementally reducing it over time until learners can perform the task independently) which is also found to have a positive impact on training transfer (Plott et al., 2014). Similarly, timely and specific *feedback* learners receive about their performance (whether they provided correct or incorrect response to a knowledge test, or whether they conducted learned techniques successfully or not) is also found to be important for the success of their knowledge acquisition and transfer (e.g., Kraiger & Ford, 2021; Lacerenza et al., 2017). Beyond the informational value (demonstrating the current state and the specific parts of knowledge, skills, and attitudes that require correction or improvement) of feedback and feedforward (i.e., information about what needs to be done next), they also have a role in enhancing learning and transfer motivation (Ford, 2020).

II/3.4. Evidence-based training methods

One of the specific training methods that received significant research attention and support on its positive effect on training outcomes is called *error management* training. This training method is intentionally incorporating errors in the program (e.g., facilitating active exploration, and/or encouraging trainees to make errors during training and learn from them; Keith & Frese, 2008). These strategies are found to have a positive impact on training transfer, especially training programs targeting the development of open skills (Ford et al., 2018).

The other specific training method that received special research attention and support is called *behavior modeling* training (BMT), which integrates multiple learning principles that were found to be effective in increasing transfer success. Behavior modeling training is based on the social learning theory (Bandura, 1977), and includes all the following elements: it describes well-defined behaviors/skills to be learned, provides models demonstrating the effective use of those behaviors, provides opportunities to practice, feedback and reinforcement, and the support for ensuring transfer (Taylor et al., 2005). In their meta-analytic review, Taylor et al. (2005) found that behavior modeling results the most beneficial outcomes when both positive and negative models are presented, and transfer of training was also positively influenced when trainees' supervisors also participated in

training, learners were instructed to set learning goals, and practice included learner-generated scenarios beyond trainer-generated scenarios.

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 many individual characteristics, but only a few showed positive relationships with transfer consistently. For example, the effect of Big Five personality dimensions were studied in several research works. From these dimensions, Blume et al. (2010) and Ford et al. (2018) identified conscientiousness among the proven personal characteristics that can influence transfer. However, Tonhäuser and Büker (2016) in their recent comprehensive literature review showed that previous findings regarding these personality dimensions are rather inconsistent. The individual characteristics that are found to be consistently related to transfer include cognitive ability, mastery orientation, motivation to learn and self-efficacy (Blume et al., 2010; Ford et al., 2018).

The general *cognitive ability* "is the capacity to rapidly and fluidly acquire, process, and apply information", involving higher mental processes such as understanding, remembering, reasoning and solving problems (Gully & Chen, 2010, p. 9). In their meta-analysis, Blume et al. (2010) found supportive evidence for the positive relationship between cognitive ability and transfer. Furthermore, studies investigating the moderating effect of cognitive ability found that individuals with higher cognitive ability benefit more from error-management training programs (Gully et al., 2002). Moreover, in their case, learning goal orientation is positively related to self-efficacy and performance, while low-ability individuals' learning goal orientation found to be unrelated or modestly negatively related to these factors (Bell & Kozlowski, 2002). Nevertheless, the moderator analysis of Blume et al., (2010) revealed that the positive relationship of cognitive ability is present only with transfer of programs targeted closed/hard skills (while all other individual characteristics were stronger related to the transfer of open/soft skills).

Self-efficacy — defined as the judgements of individuals about their own capability to perform a specific task or action (Bandura, 1982) — was consistently found to be an

important predictor of training transfer (Burke & Hutchins, 2007; Colquitt et al., 2000; Ford et al., 2018; Salas et al., 2012; Sitzmann & Ely, 2011). However, this effect seems to be specific for open/soft skill training transfer, and not for the transfer of closed/hard skills (Blume et al., 2010). Intervention studies that intended to increase self-efficacy and training transfer applied goal setting and self-management strategies interventions after training successfully (Gist et al., 1991), and also showed positive outcomes of providing cognitive modeling with practice and reinforcement (Gist, 1989).

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. Regarding the motivational aspects of goal orientation, it was found that those participants who focus on learning, seeking challenges, developing their competences and mastery task (have *mastery orientation*; Dweck, 1986) – instead of trying to avoid mistakes and focusing only on performance – learn and transfer more (e.g., Blume et al., 2010; Gegenfurtner, 2011; Gegenfurtner et al., 2016). Furthermore, *motivation to learn*, was also consistently found to be an important predictor of transfer motivation and training transfer (Blume et al., 2010; Ford et al., 2018; Gegenfurtner, 2011). The third and probably the most important motivational factor regarding training transfer is called *motivation to transfer* learned skills to the job. This motivational dimension was first defined by Noe (1986, p. 743) as the "trainees' desire to use the knowledge and skills mastered in the training program on the job" and has been found to be a key predictor of training transfer (e.g., Axtell et al., 1997; Baldwin & Ford, 1988; Gegenfurtner et al., 2009).

II/5. WORK-ENVIRONMENT CHARACTERISTICS

The third pillar of the factors influencing training transfer is related to the work environment where the learners achieve their daily duties, where the transfer attempts are expected to be implemented. 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 (situational cues and consequences), the opportunities to transfer the

learned skill on the job, and the social support participants can receive from their social 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). The role of situational cues is to remind trainees and provide them with opportunities to transfer the acquired skills. Among situational cues, Rouiller and Goldstein (1993) differentiated goal cues (e.g., supervisors set goals and encourage trainees to use the skills they acquired), social cues (behavior and influence of supervisors, peers, direct reports), task cues (design and nature of the job, like the availability of a tool, equipment, or software necessary for the application of the learned skills), and self-control cues (self-control processes and permissions to use learned skills on the job). The consequences of application or the lack of application is the other main categories of the organizational transfer climate. Rouiller and Goldstein (1993) identified the following consequences as relevant in the transfer climate: positive feedback (positive information and recognition of successful application), negative feedback (negative information about not using learned skills or not using them appropriately), no feedback (lack of information about the application, implying no importance of the skills), and punishment (negative consequences of applying the behavior, like peers make the learner ridiculous because of the application attempts of learned skills).

Holton et al. (1997) built their work on the transfer climate concept of Rouiller and Goldstein (1993). However, in line with their findings, they suggested that training participants perceive climate according to organizational referents (like peers, supervisors, tasks, or themselves) instead of psychological cues (e.g., social cues, goal cues, task cues). Accordingly, Holton et al. (1997) identified seven transfer climate constructs: opportunity to use, peer support, supervisor support, personal outcomes-positive (e.g., salary raises, career development), supervisor sanctions (e.g., negative feedback, no feedback, or active opposition of using training), personal outcomes-negative (e.g., reprimands, being overlooked for salary raises), and resistance to change (group norms discourage use). In later transfer research, these subfactors were more or less covered by the transfer climate constructs, and the positive effect of the transfer supportive climate on training transfer was

proved by several literature reviews and meta-analyses (e.g., Blume et al., 2010; Burke & Hutchins, 2007; Colquitt et al., 2000).

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). In the training transfer literature, this construct was defined as "the extent to which trainee is provided with or actively obtains work experiences relevant to the tasks for which he or she was trained" (Ford et al., 1992, p. 512). Beyond the training transfer literature, other disciplines also found the opportunity to perform a behavior as a key factor in the occurrence of a behavior, consequently its importance is emphasized by several behavior change models (c.f., Michie et al., 2014).

Among the transfer climate subfactors, the role of *social support* also received a special research interest and its positive impact on training transfer gained ample empirical support (Baldwin & Ford, 1988; Blume et al., 2010; Burke & Hutchins, 2007; Ford et al., 2018; Hughes et al., 2020). According to the meta-analysis of Hughes et al. (2020), support can account for 32% of the variance in transfer. The specific focus on support is not accidental in transfer research, as its positive effect on various work-related factors have been recognized by researchers of social psychology, health psychology, and organizational behavior for decades. For example, Humphrey et al. (2007) provided meta-analytic evidence for the positive link between social support and other favorable aspects of work like motivation, satisfaction, and performance. Humphrey et al. (2007, p. 1336) defined social support as "the extent to which a job provides opportunities for getting assistance and advice from either supervisors or coworkers". Different social support types are identified based on their providers (e.g., organizational, supervisory, and peer support) and their supportive functions (e.g., instrumental, informational, emotional, and appraisal support; House, 1981). According to Hughes et al. (2020) all the three support providers have a unique contribution to training transfer.

II/6. DYNAMIC TRANSFER MODEL

The overview of training transfer literature so far introduced the most important concepts that are related to training transfer, including the types of training transfer itself, the

training outcomes, the differences between the two major training types (i.e., hard, and soft skill trainings), and the three main pillars of transfer prerequisites (i.e., training design elements, individual and work-environmental characteristics). These puzzle pieces 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 that play important roles in training transfer. Before introducing the focus areas of the present dissertation, it is worthwhile to briefly overview the interconnection of the transfer elements that is well described by the Dynamic Transfer Model.

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. This phase also contains the evaluation of knowledge, skills, and attitudes during training, and the initial transfer motivation of participants (i.e., whether they intend to transfer the learned techniques on the job). The next phases represent the dynamic, iterative part of the model. For their description, 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; for a broader overview on dynamic interactionism see Reynolds et al., 2010). According to Blume et al. (2019), at the second phase (1) individuals who are motivated to transfer the learned knowledge, skills, and attitudes after training (2) make their first transfer attempt, (3) then they evaluate this attempt and integrate the feedback from this transfer experience. This initial transfer attempt is either increases further transfer motivation and facilitates further transfer attempts (i.e., leading to reciprocal phases of motivation-application-evaluation, which incrementally leads to the mastery of the targeted knowledge, skills, and attitudes), or this experience leads individuals to revise their transfer motivation that may result to the lack of further transfer attempts (i.e., results the loss of investment). 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 environment (including situations and people surrounding them during transfer attempts).

The model considers the constant and changing influences of both the individuals and their contexts. During each transfer attempt, relevant individual differences (e.g., cognitive

ability, mastery orientation, motivation, and self-efficacy) may influence the attempt's success and individual's perception on that experience, while these individual characteristics may also shift over time (Blume et al., 2019). Furthermore, among relevant contextual factors there are some, that are probably more constant (e.g., office environment, equipment, available resources, job characteristics) and factors that can shift more over time (e.g., transfer climate, social support). Blume et al. (2019) argue that each transfer opportunity is a combination of several contextual factors (including diverse task and situational cues and consequences) that may activate individual characteristics (traits and states) differently. According to Tett and Burnett (2003), the presence of trait-relevant situational cues activates personality traits, which are expressed in work behavior. They suggested to group the situational cues into three broad categories: task, social and organizational cues. Task cues cover the tasks and the characteristics of work of the individual, while social cues include the expectations of, and support received from peers or supervisors. Organizational cues include the organizational climate, rewarding system, strategic directions, organizational restructuring, etc. Based on these suggestions, Blume et al. (2019) argue that trained knowledge, skills, and attitudes are activated by situational cues if these are relevant and salient to the work task or activity. On the contrary, if these cues are not relevant or salient enough, individuals may not recognize the situation or task as an opportunity to transfer the learned knowledge, skills, and attitudes.

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). Considering that the primary focus of the present dissertation is on the transfer of soft skill training programs, the relevant situational cues may mainly relate to the social interactions. Soft skills cover both intrapersonal (e.g., stress management, time management) and interpersonal skills (e.g., assertive communication, negotiation). Although, relevant cues can be task- and organization-related (especially for the former one), they both are probably mainly influenced and cued by social factors (especially the interpersonal skills).

The cross-sectional nature of the studies in the present dissertation does 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 (e.g., motivation, work-related attitudes) and situational characteristics (e.g., social support, transfer opportunity, job demands and resources) in soft skill training programs.

II/7. AIMS OF THE DISSERTATION

Although training transfer literature already recognizes several important factors that can boost the transfer process, some questions remain unanswered. For example, how the occurrence of some important predictors such as different types of social support can be increased, or whether mandating training participation or allowing employees to choose voluntarily to participate in the training leads to more positive training outcomes (Gegenfurtner et al., 2016; Hicks & Klimoski, 1987). In their recent review, Ford et al. (2018) highlighted the importance of providing future research resources into investigating 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. 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. One of the main advantages of these carefully selected samples is that they 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 process (Gegenfurtner et al., 2016). Some suggested that mandatory participation (i.e., required by the organization) leads to better training outcomes (e.g., Baldwin & Magjuka, 1991; Machin & Treloar, 2004; Salas et al., 2012; Tsai & Tai, 2003). They argued that mandatory programs convey the message to participants that the program is important to the organization. In contrast, other researchers provided evidence that voluntary participation (i.e., trainee decides whether to attend) results in increased transfer outcomes (e.g., Baldwin et al., 1991; Blume et al., 2010; Curado et al., 2015; Lacerenza et al., 2017; Mathieu et al., 1992). The advantages of voluntary participation can be explained

by different theoretical lenses (Gegenfurtner et al., 2016), including self-determination theory (Deci & Ryan, 2012; Rosen et al., 2014). 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 move away from the historical dichotomous distinction to a more dynamic participation approach.

Beyond the decisions related to the level of voluntary participation, there is 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 social support (including 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 training motivation and transfer.

The subsequent chapters aim to provide information about the underlying mechanism behind the influence of general environmental characteristics like job resources and job demands and the transfer process. Achieving this aim could support our understanding of how participants transfer motivation and opportunity seeking/perception could be improved. The aim of *Study 3* was to investigate the factor structure of work engagement in two Hungarian samples, with a special focus on the question whether work engagement should be measured as a single overarching construct or via its three components. Although Study 3 is not directly related to the training transfer literature, it provides a comprehensive review of work engagement and validates the Hungarian version of the Utrecht Work Engagement Scale which provide necessary information for the final study of the present dissertation. Finally, the aim of *Study 4* was to investigate the training participants' perceptions about their work environment, and its influence on training outcomes through their 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)[6]

ABSTRACT

There have been conflicting findings about whether mandatory versus voluntary training leads to more positive training outcomes. We propose moving away from a dichotomous distinction to a more dynamic participation approach to better elucidate theoretical differences relating to self-determination theory. A sample of 311 trainees from eight companies participated in a variety of open skill (e.g., leadership) training programs. Results indicated that higher levels of voluntary participation were positively related to trainees' transfer motivation and training transfer. We also found that the level of voluntary participation moderates the relationship between supervisor support and both motivation to transfer and training transfer. Supervisor support facilitates trainee motivation and transfer to a larger extent when participation is less voluntary. Future training should be framed and promoted to increase employee motivation to voluntarily participate, especially for employees with less supervisor support.

Keywords: training transfer, motivation to transfer, level of voluntary participation, supervisor support, self-determination theory

[6] 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

III/1. INTRODUCTION

Applying the training material on the job — i.e. training transfer — is a key metric of training effectiveness. There have been a number of models outlining factors proposed to influence training motivation and transfer (e.g., Alvarez et al., 2004; Blume et al., 2019; Burke & Hutchins, 2007; Cheng & Hampson, 2008; Gegenfurtner et al., 2009). Most models indicate that both personal and contextual variables should be considered, as well as their interactions (Blume et al., 2019). Among these factors, contextual variables might be the easiest to change, hence the most important to uncover. To support this endeavor, Baldwin et al. (2017) call for richer information related to the organizational context, asking for more systematic reporting in these areas.

Although contextual variables are important as they are linked to decisions organizations make regarding how they offer training, there is only limited information available about their potential influence on trainees' motivation to transfer and their transfer of training. A frequently reported contextual variable is the degree of choice in training participation. An important decision for organizations is whether to mandate that training be taken or allow employees to choose to voluntarily participate in the training (Gegenfurtner et al., 2016; Hicks & Klimoski, 1987). While research on the mandatory versus voluntary nature of training has rightfully been framed around notions of trainee choice and motivation, this issue can also be considered in light of contextual aspects of training. As noted by Baldwin and Magjuka (1991) and Tai (2006), how companies and managers frame training opportunities influence employee perceptions and how they approach the training.

Historically, this issue has typically been thought of as being either mandatory (i.e., required by the organization) or voluntary (i.e., trainee decides whether to attend; Baldwin & Magjuka, 1991; Gegenfurtner et al., 2016; Mathieu et al., 1992). This reflects the decisions that organizations wrestle with regarding whether to mandate training or give employees choices regarding which training to attend (e.g., Paluck, 2006). Mandating training may lead some participants to resent the training (e.g., diversity or sexual harassment training which they might identify as "politically correct propaganda"; Bezrukova et al., 2016), while leaving training as voluntary may lead to another conundrum where those who need the training most are the least likely to attend. While a dichotomous distinction certainly has merit, examining interim levels between mandatory and voluntary participation may improve

our understanding of how trainees approach and experience training, as well as what boosts their subsequent application.

We can consider this dimension on a continuum, consistent with how Hicks and Klimoski, (1987) considered the degree of choice or freedom to enter training. For example, if an organization provides a training, some employees may begrudgingly attend or even resent the training (i.e., low on voluntary continuum), some employees might be happy to attend the otherwise mandatory training (i.e., moderate on voluntary continuum), while other employees may be eager to attend even a non-mandatory training (i.e., highest on voluntary continuum). Training that is not mandatory may be more straight-forward in that trainees determine whether to willingly attend the training, although these trainees are also likely to have differing levels of voluntary attendance (e.g., attendance can be driven by internal curiosity and interest or can be encouraged externally through recommendation, persuasion or expectation from their manager or work environment).

The level of voluntary participation in training for both mandatory or non-mandatory training may also differ depending on personal preferences as well as the norms, culture, and supervisory influences that exist within an organization. Although the positive impact of organizational and supervisor support on training outcomes is widely supported (Burke & Hutchins, 2007; Hughes et al., 2020), trainees who differ in how willingly or voluntarily they participate in training may require different levels of support to lead to positive training outcomes. For example, someone who more voluntarily participates in training may need less support than someone who views the training as mandatory. In the majority of prior research, contextual variables are kept constant since studies are typically conducted within one organization. This study involved multiple organizations, which makes it possible to examine and control for some of these contextual differences across open skill training programs (e.g., leadership development, stress management, assertive communication, etc.). Open skill programs were targeted because as compared to closed skills, they generally require trainees to learn principles rather than a set of rules, and the trainee typically has more choice regarding whether, how, and when to transfer the training (Baldwin et al., 2009; Blume et al., 2010; Yelon & Ford, 1999).

III/1.1. Level of Voluntary Participation

Prior research has discussed how the level of choice to participate in training influences trainee motivation to transfer and transfer (Gegenfurtner et al., 2016; Hicks & Klimoski, 1987; Ryman & Biersner, 1975). Gegenfurtner et al. (2016) highlight prior studies that have shown beneficial effects of both mandatory and voluntary training participation on training outcomes. Only a handful of studies have shown that mandatory participation in training resulted in higher levels of training motivation, which could be because a mandatory training signals to trainees that it is important to the organization (e.g., Baldwin & Magjuka, 1991; Machin & Treloar, 2004; Salas et al., 2012; Tsai & Tai, 2003). However, Baldwin and Magjuka (1991) mention that they conducted their study in a company where participants reported a generally positive attitude toward training participation. They noted that in another organizational environment where training participation is less favorable, mandatory training may have a more negative impact than their results would suggest. On the other hand, numerous studies have found that voluntary participation results in increased training motivation and outcomes (e.g., Baldwin et al., 1991; Blume et al., 2010; Curado et al., 2015; Lacerenza et al., 2017; Mathieu et al., 1992). The positive effects of voluntary participation can be explained by different theoretical lenses (Gegenfurtner et al., 2016), including participatory design research (e.g., Könings et al., 2014) and self-determination theory (Deci & Ryan, 2012; Rosen et al., 2014). The focus of participatory design is on cooperation in the design process and decision making to tailor a program to the needs of participants and other stakeholders.

As a macro theory of human motivation, self-determination theory (SDT) reflects on the motivational nature of an activity (Deci & Ryan, 2000; Ryan & Deci, 2000, 2017). The theory originated from research on extrinsic and intrinsic motivation. This theory makes a distinction between amotivation (lack of intention to act), controlled motivation (including external regulation and introjected regulation), and autonomous motivation (including more internalized external regulations like identified regulation and integrated regulation, as well as intrinsic motivation). Autonomously motivated activities can be described as activities in which people are fully engaged in the activity and are aware of their choice and have a sense of internal volition and willingness of doing the activity. In contrast, controlled motivation describes those activities which are conducted because of “a sense of pressure, a sense of

having to engage in the actions" (Gagné & Deci, 2005, p. 334). Numerous organizational studies provide evidence that, when compared to controlled motivation, autonomous motivation leads to better organizational performance and well-being of employees (Deci et al., 2017; Gagné & Deci, 2005).

SDT research findings also show that more autonomous motivation predicts more positive learning outcomes (e.g. Reeve, 2002). Although these findings suggest that autonomous motivation is preferable, the theory and the evidence do not necessarily indicate that extrinsic motivation should be eliminated. Instead, based on the extent of regulation, extrinsically motivated activities can range from least-autonomous (external regulation) to the most autonomous behavioral regulations (integrated regulation). In the case of external regulation, the behavior is directly controlled by others (e.g., through rewards like promising and providing bonuses and threats like obstruction of promotion), which often leads to short term motivated behavior with long-term side-effects (e.g., decreased engagement and performance). On the other end of the continuum (i.e., integrated regulation), individuals perceive that these volitional externally motivated activities are in harmony with their internal values, and they fully engage in them. The sense of autonomy can be increased by supporting employees to understand the purpose and value of the activity, encouraging a sense of ownership and autonomy in the accomplishment, and receiving necessary support and clear feedback (Deci et al., 2017).

From the training participants' perspective, this well-established motivational theory indicates that there is a difference within the externally motivated (e.g., mandatory) training programs regarding their sense of autonomy. It is likely that those participants who perceive a mandatory training as not just an external requirement, but also have a personal interest in participation, will experience higher motivation to transfer and training transfer. Furthermore, based on the findings of the SDT research and meta-analytic findings (Gegenfurtner et al., 2016; Lacerenza et al., 2017), voluntary participation in training should lead to the most beneficial results regarding transfer motivation and training transfer. Based on the findings of previous studies and the related theoretical background of SDT, we propose the following hypothesis:

Hypothesis 1. *The level of voluntary participation in the training program will be positively related to a.) motivation to transfer and b.) perceived transfer.*

III/1.2. Supervisor Support

Social support and its effect on different work-related factors have been investigated by researchers of health psychology, social psychology, and organizational behavior for decades. One of the most widely used differentiation of social support types is introduced by House (1981), who specified the following four supportive functions: instrumental support, informational support, emotional support, and appraisal support. Similarly, several previous works in transfer literature approached supervisor support as a multiplex or multidimensional construct (e.g., Baldwin & Ford, 1988; Lancaster et al., 2013; Lancaster & Di Milia, 2015; Nijman & Gelissen, 2011). Furthermore, Govaerts and Dochy (2014) categorized 24 different supervisor support behaviors in their systematic literature review and in their qualitative study investigating these dimensions they identified 83 specific supportive actions, strategies, approaches, and attitudes (Govaerts et al., 2017). Based on these findings, supervisor support was defined in the current study with a widely used general definition, which describes it as the extent to which supervisors reinforce and support trainees' use of learned skills on the job (Holton et al., 1997).

In the HRD literature, supervisor support has consistently been shown to be an important predictor of motivation to transfer and transfer of training (Blume et al., 2010; Burke & Hutchins, 2007; Huang et al., 2015; Hughes et al., 2020). Blume et al. (2010) found that support (peer and supervisor) had a positive correlation ($r = .21$) with training transfer. Subsequent analysis indicated that supervisor support may have a somewhat stronger relationship ($r = .31$) with transfer than does peer support ($r = .14$), although all of these relationships were based on small sample sizes (Blume et al., 2010). In their meta-analysis, Hughes et al. (2020) found that motivation to transfer was an important mediator, explaining the ability of work environment support variables (i.e., organizational, supervisory, and peer support) to predict training transfer.

SDT literature also highlights the importance of supervisor support. In a general work setting, employees are more likely to have high-quality performance and wellness when supervisors acknowledge employees' perspectives, encourage self-initiation, offer choices, provide meaningful feedback, and give rationales when making requests (Deci et al., 2017). It is likely that these supportive behaviors from supervisors result in positive outcomes within the training transfer context.

Hypothesis 2. *Supervisor support will be positively related to a.) motivation to transfer and b.) perceived transfer.*

III/1.3. Interaction between Level of Voluntary Participation and Supervisor Support

Curado et al. (2015) found that employees who voluntarily participated in training had higher autonomous motivation to transfer their training. The higher autonomous motivation to transfer indicates that these participants will also be more engaged in the activity and will show higher transfer of training. Although supervisor support (e.g., encouragement or clear feedback) could further increase their motivation level, their already recognized self-interest and sense of ownership would likely make supervisor support less crucial.

On the other hand, with training that is less voluntary, supervisor support would be expected to be more critical to motivating and encouraging training transfer. The common argument in favor of mandatory training is that it makes clear for the participants (which is assumed to motivate them) that the targeted knowledge, skills, or attitudes are highly valued by the organization (e.g., Ellis & Sonnenfeld, 1994; Paluck, 2006; Salas et al., 2012). However, it is likely that some mandatory training could evoke negative reactions, especially when there is not enough supervisor support. This could occur if organizations do not provide rationale to employees about the importance of the program, or participants do not recognize their personal interest in the topic and after the program, they do not receive further encouragement to apply their training. In these cases when participants perceive more controlled (or less autonomous) motivation, supervisor support would be especially important for trainees to be motivated to apply the training, to feel accountable, and to gain a sense of ownership in their development and transfer of training.

In cases where participants are well-prepared for or want to participate in mandatory programs (e.g., the program is relevant and useful for the participants and they recognize their self-interest in the program), we would expect participants to regulate their extrinsic motivation and perceive their participation in the training as less controlled and more autonomous. In these cases where there are elements of both mandatory and voluntary participation (e.g., a moderate or mixed level of voluntary participation), participants are likely to require less support from their supervisors than in a completely mandatory program. In addition, based on the external, controlled origin of participation, it is likely that these

participants need more support from their supervisors in comparison to those who participate in an entirely volitional way.

Based on the above arguments related to the voluntary nature of the training, support, and SDT, we propose that the level of voluntary participation in training will moderate the relationship between supervisor support and transfer. We expect that a higher level of voluntary participation will lead to higher autonomous motivation, which would be less sensitive to (or dependent on) supervisor support. Stated differently, we expect that supervisor support will generally have stronger effects on training outcomes when there is a lower level of voluntary participation. Given this reasoning, we expect:

> **Hypothesis 3.** *The level of voluntary participation in the training program will moderate the relationship between supervisor support and (a) motivation to transfer and (b) perceived transfer; such that the effect of supervisor support on motivation to transfer and perceived training transfer will be stronger at lower levels of voluntary participation.*

III/2. METHOD

III/2.1. Sample and Procedures

The study was conducted in accordance with the Declaration of Helsinki, approved by the Institutional Review Board of the Eötvös Loránd University Faculty of Education and Psychology, and is in line with the EU General Data Protection Regulation (2016). An invitation to participate in the study was sent to employees of eight mid- to large-size Hungarian 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. At the beginning of the survey, respondents explicitly gave their informed consent to participate.

There were several steps conducted to maximize the respondent's ability and motivation to respond accurately. These steps are in line with suggestions of procedural remedies that can decrease some aspects of the problem of common method variance (e.g., Podsakoff et al., 2012; Reio, 2010). The survey was pretested with three participants of different training programs to ensure all instructions and items used concise and clear language and were easily understandable. Accurate responses were encouraged in the

recruitment email and the survey's instructions by emphasizing the importance of participants' opinions, thoughts, and experiences. Respondents were informed that there are no right or wrong answers, and it was important to accurately indicate their honest opinion and experience. Anonymity was also ensured, and in line with the EU General Data Protection Regulation (2016), a detailed data management document informed participants about all relevant aspects. Respondents were told that company-specific reports (containing company-specific, but summarized data to make identification of respondents impossible) would be provided to their employers to support them in improving the usefulness and application of future training programs.

From a total of 380 survey respondents, the final sample included those who participated in a company-organized, open/soft-skill development training program (e.g., leadership development, assertive communication, sales, stress management, time management) with at least one classroom session and who responded to the survey between 13-120 days after training. The timeframe was chosen to ensure that participants had at least two weeks following their training session to transfer the training to their job, as well as to stay within 4 months post-training to ensure the training was recent enough to accurately recall actions taken based on the training. In the online survey, respondents were instructed to consider the last training program in which they participated.

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 in different organizational levels (54% non-managers; 46% managers) of these eight companies (workforce ranged between 500-15,000 employees), which operate in the following sectors: accounting, automotive, chemical, energy, financial, insurance, pharmaceutical, and retail. Detailed company characteristics are shown in Table 1.

III/Table 1. Descriptive statistics by participating companies

Variables / Company Codes	1	2	3	4	5	6	7	8	Total
N	81	34	41	10	21	34	54	36	311
Gender (Female)	26%	50%	56%	60%	67%	32%	57%	72%	48%
Mean Age (SD)	36 (8)	40 (9)	41 (9)	40 (5)	32 (7)	41 (9)	40 (10)	43 (11)	39 (9)
Organizational level (Manager)	47%	44%	39%	80%	48%	71%	37%	36%	46%
Mean Time lag (SD)	66 (30)	56 (25)	42 (25)	61 (26)	50 (18)	31 (15)	32 (21)	35 (15)	47 (27)
Training Program Length									
Half day	4%	0%	12%	20%	14%	0%	22%	0%	8%
One day	10%	12%	12%	40%	29%	53%	78%	19%	30%
Two days	79%	65%	61%	30%	57%	35%	0%	81%	54%
More than two days	7%	24%	15%	10%	0%	12%	0%	0%	8%
Materials Before Classroom	12%	29%	54%	60%	10%	26%	0%	3%	19%
Materials After Classroom	41%	56%	71%	60%	62%	74%	72%	81%	62%
Level of Voluntary Participation									
Mandatory	21%	6%	17%	0%	29%	26%	4%	6%	14%
Mixed	36%	65%	34%	20%	38%	35%	22%	22%	34%
Voluntary	43%	29%	49%	80%	33%	38%	74%	72%	51%
Mean Supervisor Support (SD)	3.9 (1.5)	3.4 (1.3)	4.9 (1.8)	4.6 (1.6)	3.8 (1.3)	3.4 (1.8)	3.3 (1.4)	3.5 (1.3)	3.8 (1.6)
Mean Motivation to Transfer (SD)	5.0 (1.4)	5.0 (1.3)	5.5 (1.7)	5.6 (1.1)	4.8 (1.4)	4.7 (1.3)	5.1 (1.1)	5.3 (1.3)	5.1 (1.4)
Mean Perceived Training Transfer (SD)	4.8 (1.4)	4.8 (1.5)	5.2 (1.6)	4.6 (1.6)	5.1 (0.9)	4.8 (1.5)	5.1 (1.1)	5.0 (0.9)	5.0 (1.3)

Note. The table shows the descriptive statistics (means and standard deviations of continuous variables, and frequencies of categorical variables) by companies. Time Lag: Time Lag Between Training & Outcome Measure; Materials Before Classroom: received Materials Before Classroom Training Session; Materials After Classroom: received Materials After Classroom Training Session.

III/2.2. Measures

Data collection was conducted in Hungarian. To support the potential application of the shared materials in future research, the original materials were translated into English, following a standardized translation-back translation protocol proposed by Beaton et al. (2000). The full questionnaire and related materials are available on the project's OSF page: https://osf.io/a3jpq/?view_only=7776fe793f654b0cba57be5ffd65e077

Outcome Variables

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' posttraining transfer motivation. The items of the scale included "After completing the training, I was excited to use the techniques I learned there."; "By the end of the training, I felt that I would love to use what I learned immediately in my job.", "By the end of the training, I was determined to use the new techniques I learned at the training.". Responses were provided on a seven-point Likert-scale ranging from 1 (Not true at all) to 7 (Completely true). This scale indicated good internal consistency ($\alpha = .91$).

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 (e.g., "In my workplace, I used what I learned during the training."; "I tried the techniques at work I had learned at the training."; "At my workplace, I applied the methods acquired during training."; "In my day-to-day work, I implement the knowledge that I had acquired at the training."; $\alpha = .95$.). Each item was scored on a seven-point Likert-scale ranging from 1 (Not true at all) to 7 (Completely true).

Predictor Variables

Supervisor Support. Considering the wide range of possible behaviors that the supervisor support could include (Govaerts & Dochy, 2014), the three items for this scale were phrased using general terms (e.g., "My manager actively supported me to use what I had learned during training."; "I regularly talked with my manager about how I could use the new knowledge in my work."; "My manager did a lot for me to be able to apply the acquired methods in my work."). Respondents indicated their level of agreement using a seven-point

Likert-scale ranging from 1 (Not true at all) to 7 (Completely true). The scale showed good internal consistency ($\alpha = .87$).

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. Rather than follow the classic dichotomy of mandatory versus voluntary participation, we added the moderate/mixed level. The additional level originated in a pilot interview study which was conducted with 5 managers of a financial company. It was obvious from the interviews that the classic differentiation between mandatory and voluntary programs would be unrealistic and artificial in several cases. In one example, the program was either strongly suggested or selected by the supervisor, then it was discussed with the employees, and they were also involved in the final decision making. In another case, the manager shared the following approach: "I ascertain my team members' needs and interests at a team meeting, but I never share any specific information with them. Unfortunately, my personal experience is that if I would show them the full list of the programs and discuss their interest based on that list, they would be disappointed if the management would decline our request. So, I rather assess their needs less directly, and I send a list of nominations that I created myself. I do not promise them anything. I just tell them that I can provide the exact information after receiving feedback. My nominations list is usually cut down or transformed, and I communicate only the final one to my team." Once this measure was developed, it was discussed with subject-matter experts (L&D professionals and consultants) and pilot tested with three randomly selected training participants in different companies. They all agreed that the three-level measure was more realistic than the dichotomous approach.

Control Variables

Training program length. In their interdisciplinary review, De Rijdt et al. (2013) identified training program length among those variables that were not included in transfer models in management, HRD, and organizational psychology research; while educational reviews that focused on the impact of staff development mentioned it as a potentially influencing variable (De Rijdt et al., 2013). While we know that training programs vary in

length, it is less clear how the length of the training might influence motivation to transfer and transfer. 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. For some in-person training sessions, materials are distributed before and/or after the actual training session (e.g., via email or an online learning system). Baldwin and Magjuka (1991) found that if trainees received information from the training department or instructor prior to the training session, they reported greater intentions to transfer the training. Regarding distributing materials after training, the purpose could be to remind trainees about the training and encourage use on the job. 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. It could be that longer time lags since the end of training would cause trainees to report being less motivated to transfer. After more time passes, as Taylor et al. (2009) suggest, there could be learning decay and trainees may also be less focused on the training goals or applying the training to their job. 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. Chen et al. (2006) proposed that the job type or position could influence perceptions of transfer system characteristics such as motivation to transfer and supervisor support. 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). The vast majority of respondents were either lower-level managers or 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). All companies were from different sectors.

III/2.3. Data processing and 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. The data and analysis code can be found on the project's OSF page: https://osf.io/a3jpq/?view_only=7776fe793f654b0cba57be5ffd65e077

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

Descriptive statistics and Spearman bivariate correlations are presented in Table 2.

III/Table 2. Descriptive statistics and Spearman bivariate correlations between variables

	1	2	3	4	5	6	7	8	9
1. Time Lag	–								
2. Manager	.04	–							
3. Training Program Length	.16**	.02	–						
4. Materials Before Classroom	.08	–.01	.23***	–					
5. Materials After Classroom	–.14*	–.07	.01	.05	–				
6. Level of Voluntary Participation	–.04	–.18**	–.01	.03	.24***	–			
7. Supervisor Support	.19***	.01	.14*	.24***	.10	.07	–		
8. Motivation to Transfer	–.06	–.01	.13*	.16**	.18**	.37***	.43***	–	
9. Perceived Training Transfer	.03	.12*	.06	.15**	.10	.23***	.42***	.69***	–
Mean	47.25	.46	2.62	.19	.62	1.37	3.78	5.09	4.95
SD	27.24	.50	.75	.40	.49	.72	1.58	1.35	1.34

Note. N=311, Time Lag: Time lag between training and outcome measure; Manager (0 = Non-managers, 1 = Managers); Training Program Length (1 = less than half day, 2 = approximately 1 day, 3 = more than 1 day, but maximum of 2 days, 4 = more than 2 days); Materials Before Classroom Session (0 = No, 1 = Yes); Materials After Classroom Session (0 = No, 1 = Yes); Level of Voluntary Participation (0 = Low [Mandatory], 1 = Moderate [Mixed], 2 = High [Voluntary]).

*p < .05, **p < .01, ***p < .001

III/3/1. Motivation to Transfer

Table 3 shows the hierarchical regression model for 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 (β = -.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 (β =

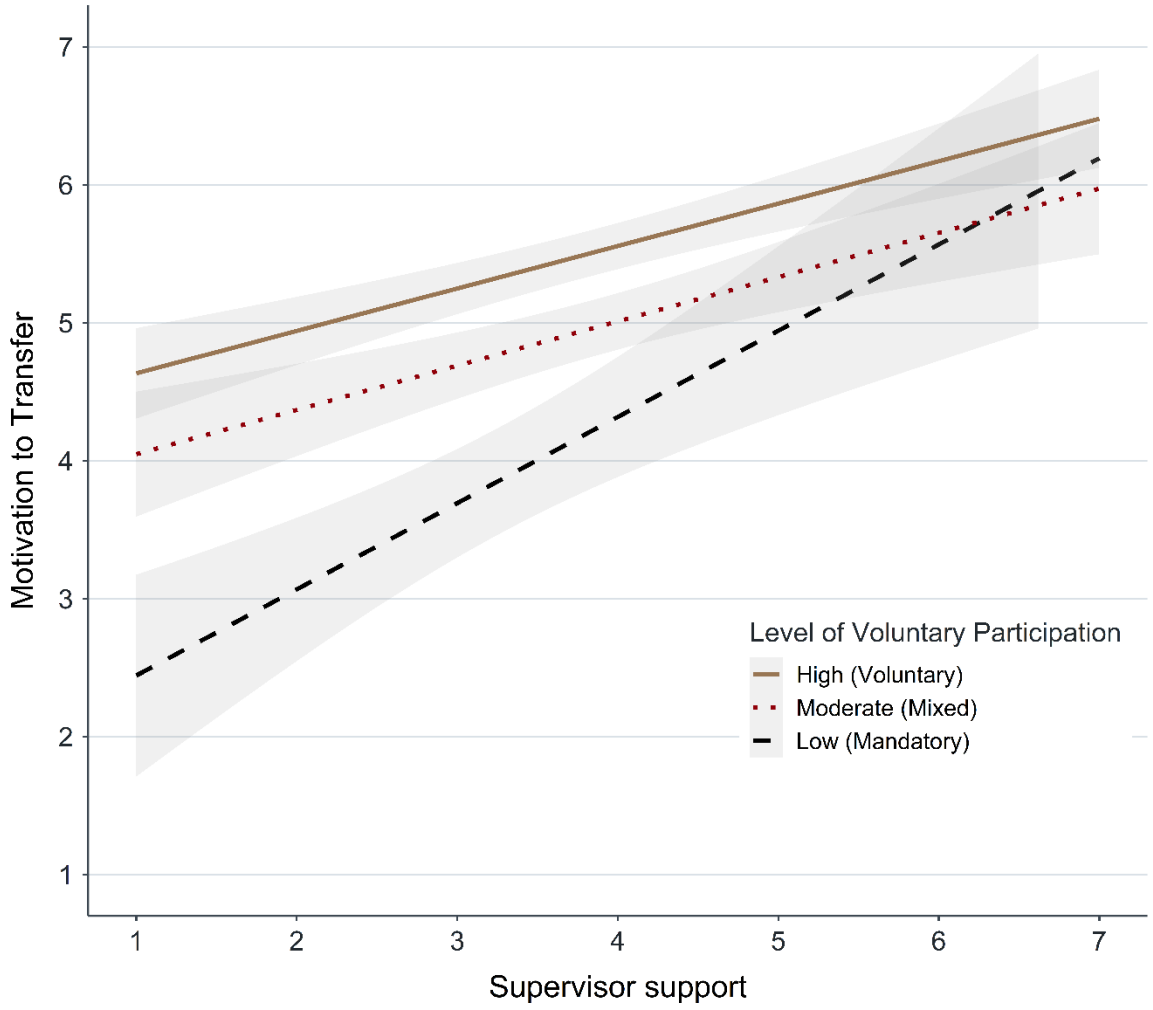
.14, p = .155), training program length (β = .09, p = .166), and receiving materials before classroom training (β = .09, p = .481) and after classroom training (β = .07, p = .529). As expected, motivation to transfer was significantly predicted by the (H1a) level of voluntary participation (β = .35, 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/Table 3. Linear regression models of Motivation to Transfer

	Model 1 [95% CI]	Model 2 [95% CI]	Model 3 [95% CI]
Constant (Company 1)	-0.09 [-0.31, 0.14]	-0.28 [-0.58, 0.02]	-0.05 [-0.29, 0.19]
Company 2	-0.12 [-0.62, 0.39]	-0.13 [-0.60, 0.34]	-0.08 [-0.44, 0.28]
Company 3	-0.19 [-0.59, 0.21]	-0.40 [-0.89, 0.09]	-0.26 [-0.65, 0.14]
Company 4	0.13 [-0.19, 0.45]	0.20 [-0.26, 0.66]	-0.07 [-0.45, 0.31]
Company 5	0.23 [-0.15, 0.62]	0.05 [-0.39, 0.49]	-0.10 [-0.48, 0.28]
Company 6	0.00 [-0.39, 0.39]	-0.18 [-0.58, 0.22]	0.04 [-0.30, 0.37]
Company 7	0.39 [-0.06, 0.84]	0.12 [-0.38, 0.62]	-0.08 [-0.52, 0.35]
Company 8	0.49 [-0.09, 1.08]	0.39 [-0.23, 1.01]	-0.03 [-0.57, 0.50]
Time Lag Btw. Training & Outcome Measure		-0.09 [-0.23, 0.04]	-0.20*** [-0.31, -0.08]
Manager		0.05 [-0.18, 0.28]	0.14 [-0.05, 0.34]
Training Program Length		0.16 [-0.00, 0.33]	0.09 [-0.04, 0.21]
Materials Before Classroom Session		0.30 [-0.02, 0.62]	0.09 [-0.16, 0.35]
Materials After Classroom Session		0.32* [0.07, 0.57]	0.07 [-0.15, 0.29]
Level of Voluntary Participation			0.35*** [0.24, 0.46]
Supervisor Support			0.44*** [0.32, 0.55]
Superv. Sup. * Level of Voluntary Part.			-0.11* [-0.22, -0.00]
Statistics	F(8, 303) = 1.406	F(13, 298) = 2.987**	F(16, 295) = 13.366***
R^2 / Adj. R^2	0.034 / 0.012	0.103 / 0.067	0.387 / 0.356
AIC	888.79	875.89	763.25
BIC	922.45	928.25	826.83

Note: The table shows standardized regression coefficients of the hierarchical models' predictive variables for Motivation to Transfer as dependent variable. N = 311, Standard Error Estimator = HC3, CI = Confidence Interval, AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion.

*p < .05, **p < .01, ***p < .001



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

III/3/2. Perceived Training Transfer

As shown in Table 4, 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.$R^2 = .032$) were significant. Model 3 was significant ($F(16, 295) = 8.360$, $p < .001$, adj.$R^2 = .284$). The results showed no significant effect of the time lag between training and the outcome measure ($\beta = -.12$, $p = .063$) on perceived transfer, and similarly, training program length ($\beta = .01$, $p = .897$), receiving materials before classroom training ($\beta = .24$, p

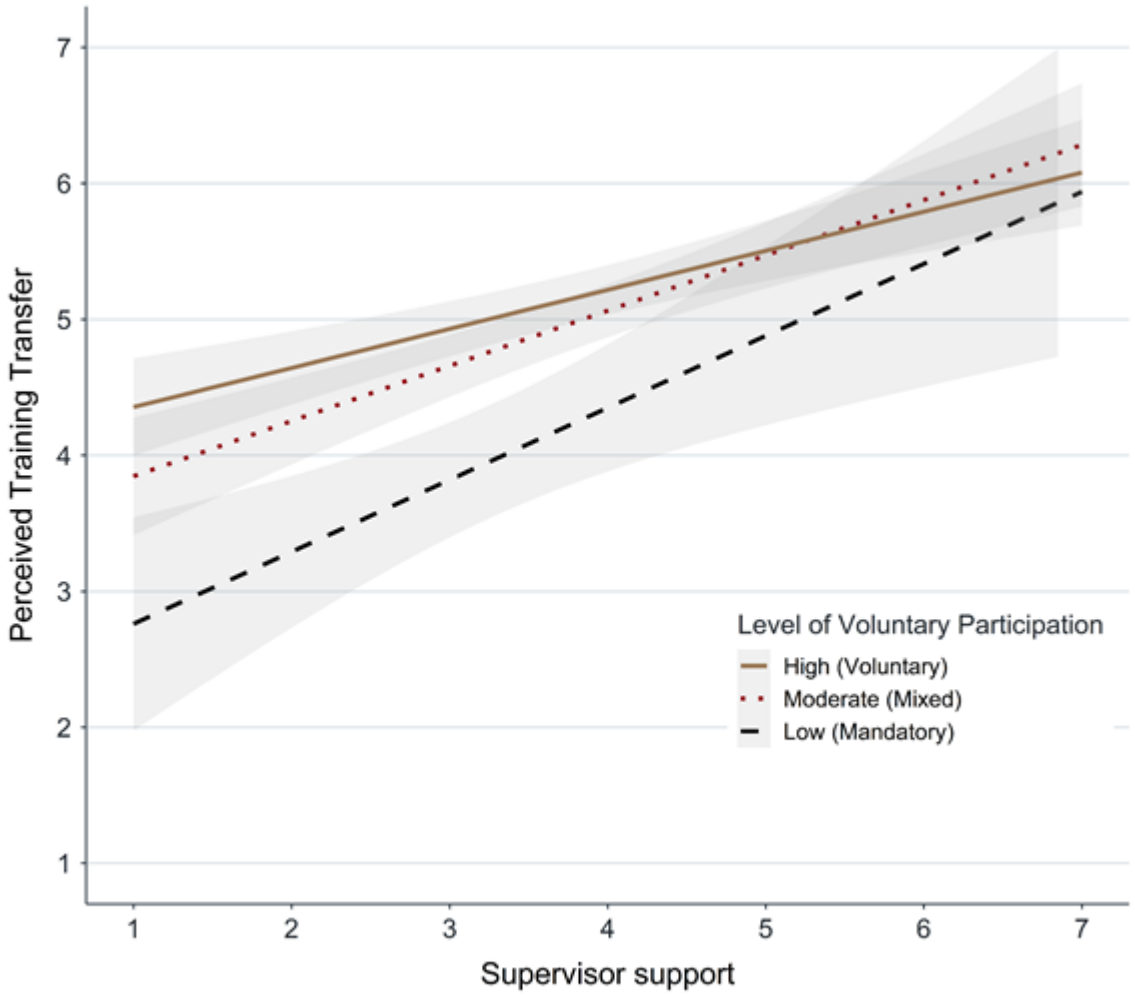
= .097), and after classroom training (β = -.01, p = .968) did not show a significant association with perceived transfer. Nevertheless, managerial level positively predicted perceived transfer (β = .32, p = .003). In line with our hypotheses, (H1b) the level of voluntary participation (β = .24, p < .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/Table 4. Linear regression models of Perceived Training Transfer

	Model 1 [95% CI]	Model 2 [95% CI]	Model 3 [95% CI]
Constant (Company 1)	-0.11 [-0.34, 0.12]	-0.39* [-0.69, -0.09]	-0.19 [-0.43, 0.04]
Company 2	0.24 [-0.14, 0.62]	0.25 [-0.15, 0.64]	0.27 [-0.09, 0.64]
Company 3	-0.00 [-0.45, 0.45]	-0.19 [-0.72, 0.35]	-0.04 [-0.48, 0.39]
Company 4	0.19 [-0.13, 0.52]	0.30 [-0.17, 0.76]	0.12 [-0.27, 0.52]
Company 5	0.17 [-0.14, 0.49]	0.15 [-0.24, 0.53]	0.06 [-0.28, 0.40]
Company 6	0.00 [-0.44, 0.45]	-0.13 [-0.58, 0.33]	0.09 [-0.27, 0.46]
Company 7	0.29 [-0.15, 0.73]	0.06 [-0.46, 0.58]	-0.15 [-0.58, 0.27]
Company 8	0.12 [-0.72, 0.95]	-0.16 [-0.99, 0.66]	-0.50 [-1.29, 0.28]
Time Lag Btw. Training & Outcome Measure		-0.02 [-0.16, 0.12]	-0.12 [-0.24, 0.01]
Manager		0.26* [0.02, 0.49]	0.32** [0.11, 0.52]
Training Program Length		0.08 [-0.08, 0.23]	0.01 [-0.12, 0.14]
Materials Before Classroom Session		0.45** [0.11, 0.78]	0.24 [-0.04, 0.53]
Materials After Classroom Session		0.21 [-0.05, 0.47]	-0.00 [-0.23, 0.22]
Level of Voluntary Participation			0.24*** [0.12, 0.35]
Supervisor Support			0.47*** [0.35, 0.58]
Superv. Sup. * Level of Voluntary Part.			-0.11* [-0.22, -0.01]
Statistics	F(8, 303) = 0.540	F(13, 298) = 1.729	F(16, 295) = 8.360***
R^2 / Adj. R^2	0.013 / -0.010	0.069 / 0.032	0.318 / 0.284
AIC	895.50	887.27	796.35
BIC	929.16	939.63	859.93

Note. The table shows standardized regression coefficients of the hierarchical models' predictive variables for Perceived Training Transfer as dependent variable. N = 311, Standard Error Estimator = HC3, CI = Confidence Interval, AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion.

*p < .05, **p < .01, ***p < .001



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

III/4. 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. This is likely caused by the sustained controlled motivation as supervisors follow up with trainees, increase accountability, and support their transfer. Furthermore, the reason behind this boost in motivation and perceived transfer could also be that supervisors apply autonomy-supportive techniques leading participants to value transferrable skills.

The explained variance in this study was 38.7% for motivation to transfer and 31.8% regarding perceived training transfer. The combination of the level of voluntary participation and supervisor support contributed to the majority of this explained variance (about 28% and 25%, respectively) beyond the control variables. While these are significant levels of variance explained, there remains unexplained variance that is likely due to unmeasured variables. The classic equation stating that performance = ability x motivation x opportunity (Appelbaum et al., 2000; Blumberg & Pringle, 1982; Vroom, 1964) can capture the essence of training transfer performance. In our study, we measured one aspect of motivation (level of voluntary participation) and one aspect related to the opportunity (i.e., social support as a form of social opportunity). While these measures are important for understanding the transfer process, additional measures of these constructs and a measure of trainee ability could also improve our understanding of training transfer.

III/4.1. Theoretical implications

The presence or lack of an autonomy-supportive environment can provide an explanation for previous mixed findings regarding the superiority of mandatory participation in some studies (e.g., Baldwin & Magjuka, 1991; Tsai & Tai, 2003) and the superiority of voluntary training participation in others (e.g., Baldwin et al., 1991; Mathieu et al., 1992). Considering the moderate level of voluntary participation, which includes a combination of external expectation and an internal volition to participate (i.e., a more autonomous extrinsic motivation to use SDT terminology), the findings highlight the importance of interest, workplace climate, and an autonomy-supportive environment in motivation. These findings

are consistent with the results of Baldwin and Magjuka (1991), who reported high transfer motivation of mandatory training programs in an organization where there was a generally positive attitude toward training participation.

Our findings are in line with other aspects of SDT as well. SDT suggests the more autonomous motivation (higher level of voluntary participation in our case) leads to higher motivation to act (motivation to transfer) and perform (transfer) in comparison with the effect of a more controlled motivation (lower level of voluntary participation; e.g., Gagné & Deci, 2005). Furthermore, in those circumstances when there is an extrinsically motivated activity (i.e., external expectation of participation), a more autonomous motivation through internalization and integration can be facilitated by autonomy support (Deci et al., 2017). Our findings suggest that although the impact of social support is stronger in more extrinsically regulated situations, its effect should also not be neglected in a more autonomously motivated situation.

In addition, we found that the level of voluntary participation meaningfully differed across three levels rather than the typical two dimensions (i.e., mandatory vs. voluntary) assessed in prior research. The findings are consistent with Curado et al. (2015) in that voluntary participation was associated with more positive training outcomes. The findings also support those arguments that mandatory training programs can result in good outcomes (e.g., Ellis & Sonnenfeld, 1994; Paluck, 2006; Salas et al., 2012) if the organization/managers convey the message successfully so participants become more interested in participating and internalize its value. This suggests that trainees have varying levels of desire to participate in training, regardless of whether the external expectation is stronger, weaker, or does not exist, and that future research should consider this continuum when examining the influence of self-determination in attendance. Although Hicks and Klimoski (1987) operationalized the variables in their study along only two levels (i.e., low or high degree of choice), this is consistent with how they discussed the degree of choice or freedom to enter training. These findings suggest that SDT provides a better, well-established theoretical framework for understanding the dynamism of training participation, and we can learn more by moving away from the dichotomous approach to a more continuous one.

III/4.2. Practical implications

The current study enables us to build on previous evidence-based suggestions for HRD practitioners, training providers, and managers. Jacot et al. (2015, p. 214) rightfully stated that while "it is not always possible to grant maximum autonomy to every learner", decision-makers in organizations and especially direct supervisors should create conditions of the highest level of autonomy that can be achieved. Autonomy support that increases transfer motivation and transfer can be executed by different kinds of managerial activities. For example, managers can support their colleagues by providing the resources they need, eliminating obstacles, ensuring participants have relevant opportunities to transfer, and giving feedback and encouragement (e.g., Broad, 1997, 2003; Ford, 2020; Yelon et al., 2004).

While there are certain training programs that companies may require, in these cases companies would be advised to encourage and build supervisor support for these programs. Gegenfurtner et al. (2016, p. 297) suggest that in those situations when mandating enrollment is inevitable, "offering options or choices for trainees to decide which program to attend, or when to attend it, can still help in supporting the trainee need of feeling autonomous and self-determined." In addition, if supervisors buy into and support organizationally-mandated training programs, in this condition we would expect higher trainee motivation and transfer. Otherwise, our study indicates that mandatory, open skill programs with low supervisor support would likely lead to lower motivation to transfer and training transfer. Gegenfurtner et al. (2009) also highlight the importance of training framing in their integrative literature review about motivation to transfer training. They summarize that learner readiness impacts higher transfer motivation, which can be supported by training framing; including providing realistic information about the program and about the company's expectations, and enabling participants to provide their insights. Similarly, Machin and Treloar (2004) advised that pre-training interventions should target both individual and organizational readiness, and enhance participants' perceived value of the training by explaining the benefits the participants will gain by participating and transferring training.

We argue that these suggestions could provide the best outcomes in combination with the findings of SDT research, especially those focused on autonomy-supportive techniques. These techniques can direct learning motivation from controlled to more volitional behavior. Vansteenkiste et al. (2018) summarized previous research findings on the techniques that can

foster internalization. Based on the evidence highlighted by Vansteenkiste et al. (2018), one of the most important techniques is providing rationales about the importance of the learning content, which should be relevant to the learner itself, and resonate with their personal values, interests, and goals. These "rationales are especially likely to lead students to internalize the value of a task when it is concrete and specific, intrinsic-goal oriented, and delivered within a broadly autonomy-supportive environment that is free from pressure or coercion" (Vansteenkiste et al., 2018, p. 45). These findings and suggestions are in line with those mentioned in the HRD literature (cf., Ford, 2020; Kraiger & Ford, 2021).

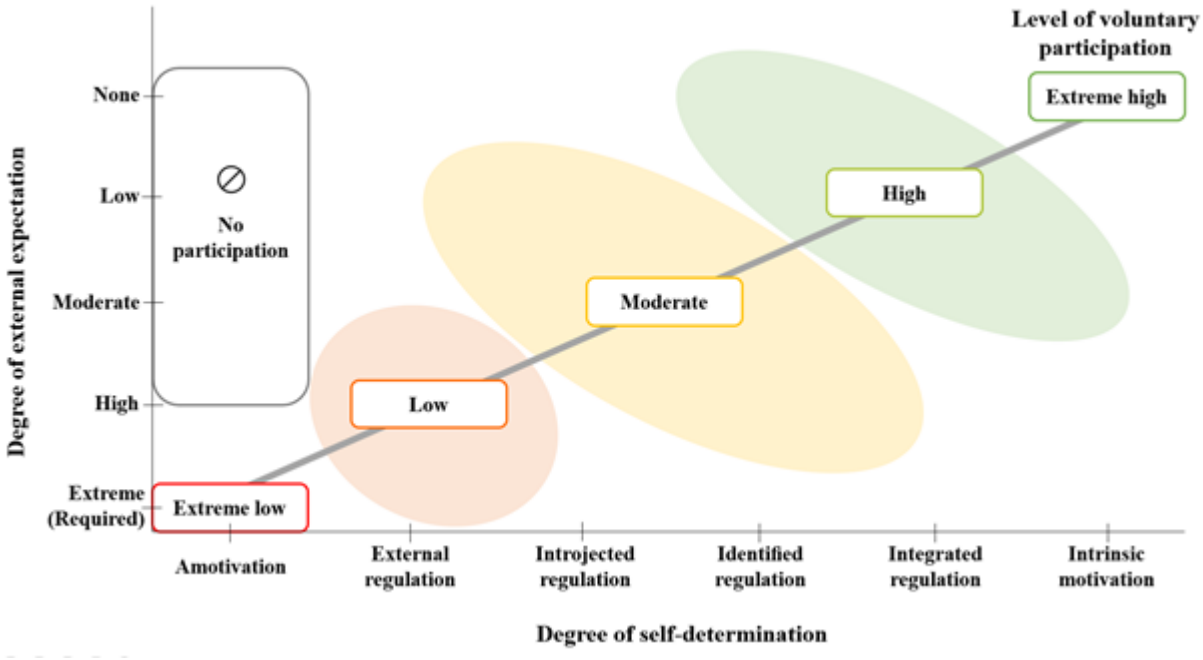
Among the autonomy-supportive strategies that can foster autonomy when the volition of learning is very low, Vansteenkiste et al. (2018) mentioned the use of inviting language (Vansteenkiste et al., 2004) and accepting rather than suppressing the resistance and negative affect towards the particular task (Deci et al., 1994). According to Deci et al. (1994) the acknowledgment of the interpersonal conflict between the required activity (participation in training) and the personal unwillingness to participate can convey respect towards the individual's willingness and right to choose. It can help mitigate the internal tension and makes it possible to understand that the personal goals can be harmonious with the requested behavior. An example of an acknowledgment might be "I realize that it seems like a waste of time to you to attend this training." It can be continued with the rationale regarding the (e.g., assertive communication) training program: "However, this program aims to improve your communication skills so that you can represent our departments' interests more effectively, influence others, and improve outcomes. It can result both in your professional development and future career advancement."

III/4.3. Future Research

An important direction for future research relates to how we think about the continuum of mandatory and non-mandatory training. Focusing on two dimensions might be particularly useful when exploring this issue further (i.e., including both a contextual and trainee/person-related dimension). For example, an expanded scale that integrates these dimensions could include the following items: "The training was mandatory and I didn't want to attend (would skip if I could)", "The training was mandatory but I also wanted to attend (or would have attended even if it wasn't mandatory)", "The training was voluntary and I wanted to attend", and "The training was voluntary and I was very excited to attend".

Although this four-level scale should improve our knowledge in this area, the development of a more sophisticated measurement scale that follows the SDT even more closely could potentially be developed.

In this case, the person-related dimension could directly incorporate SDT by considering the degree of self-determination, while the contextual dimension could focus on the degree of external expectations (i.e., ranging from extreme or required to none or entirely voluntary). If we map these two dimensions onto each other, their interaction illustrated in Figure 3 shows how these two dimensions lead to differing levels of voluntary participation. Considering the intersection of the extreme external expectations (required program) and lack of motivation (amotivation), the level of voluntary participation would be extremely low (i.e., participation is purely forced). It is likely that if employees are not motivated to participate, and the degree of external expectation is lower (i.e., not forced, just suggested by supervisors, or mentioned by others) they would prefer to skip the training. When moving from the controlled motivations to the more autonomous motivations, the level of voluntary participation also increases. In the middle of the scale, there are potentially multiple combinations of external expectations and motivations which results in a similarly moderate level of voluntary participation. For example, the level of voluntary participation may be similarly moderate at low external expectation and external regulation, at moderate external expectation and introjected regulation, and high external expectation and identified regulation. At the higher end of the level of voluntary participation, participants experience the least external expectation and a well-internalized extrinsic motivation (i.e., identified or integrated regulation) or intrinsic motivation.



III/Figure 3. A proposed approach to capture both contextual (degree of external expectation) and personal (degree of self-determination) dimensions to determine the level of voluntary participation

Overall, SDT provides a good theoretical framework to understand the potential mechanisms behind our findings, and it would be useful to directly measure autonomous and controlled motivation in future research (both before and after participation). For testing a more sophisticated scale that measures the degree of self-determination in participation, revising the Multidimensional Work Motivation Scale (Gagné et al., 2015) to the transfer context could potentially be worthwhile. Although an SDT-based measure is likely to best-capture the motivational continuum, other motivation-related measures could also be considered (e.g., trainees' pre-training motivation to learn (Blume et al., 2010; Gegenfurtner et al., 2009), the motivation to attend the training, or interest in training content (Gegenfurtner et al., 2020)). These dimensions should be considered together to get a better understanding of how trainees' perceptions will influence their reactions and behaviors following training. In addition, based on the findings in our study, this SDT-based measure may also be beneficial when considering the level of supervisor support required to lead to optimal training outcomes.

It may also be beneficial to further explore trainee perceptions of how mandatory training programs that are prescribed at a higher organizational level (e.g., by the Human Resources Department) versus those required or strongly recommended by the trainees' direct supervisor. It can be assumed that internalization and autonomy-supportive environment could play an important role in both situations, while their motivational dynamics for participating in the training could be different. It would also be important to consider the influence of supervisors in their attitudes toward and support of organizationally mandated training (e.g., safety or sexual-harassment training). Based on our findings, it is likely that supervisor attitudes and their support (or lack of support) for organizationally mandated training directives will influence trainee motivation and outcomes. The success of the specific supervisor support types may vary whether these programs are required by the higher organizational level or by the direct manager. It would be also useful to more explicitly consider the multidimensional nature of support (e.g., in intensity and form; Govaerts & Dochy, 2014; Nijman & Gelissen, 2011) to identify the most effective supervisor support behaviors for increasing motivation to participate, motivation to transfer, and training transfer.

In addition, managers reported higher perceived training transfer than non-managers in our study. This could be because managers may see more of a need for open or soft-skills in their work and believe implementing their training on the job is important for their job performance and advancing in their careers. They may also have more opportunities to transfer these skills or have a greater appreciation for the valuable time they have invested in the training. While future research will be necessary to better understand why managers may report more transfer, if managers see a greater need and opportunity for transferring skills, this may be an occasion for organizations to better communicate to non-managers the value of the trained skills for job performance and potential career advancement. For example, Renaud et al. (2004) showed that those higher in the hierarchy were more likely to participate in non-mandatory training, which could be because the corporate training strategy primarily targets managers or because managers apply for more training programs if they are more conscious of their development needs. It may be that helping non-managers understand what managers have learned by experience could increase learner readiness and foster autonomous

motivation (e.g., having managers speak to a group of non-managers before the training session to explain the importance of gaining skills from a leadership training session).

III/4.4. Limitations

In interpreting these findings, five limitations should be considered. First, this study was cross-sectional with self-report measures, limiting causal interpretation of the relationships between the level of voluntary participation, supervisory support, and the dependent variables. However, the implemented procedural remedies of common method variance (e.g., Podsakoff et al., 2012; Reio, 2010) incorporated into our study could alleviate the concerns of these problems. The issue of common method variance is probably the most relevant in connection with the second hypothesis, which relationship was supported in several previous studies (e.g., Blume et al., 2010; Chiaburu et al., 2010; Colquitt et al., 2000; Ford et al., 2018). Regarding the other hypotheses, since the level of voluntary participation (e.g., whether the training was purely required, both required and desired, or solely voluntary) was more objective in nature, that could help mitigate this concern. Furthermore, the third hypothesis tested an interaction effect, and research suggests that although interaction effects can be deflated by method bias, they are unlikely to be artifacts of it (Podsakoff et al., 2012; Siemsen et al., 2010). Nevertheless, replication of the study in conditions where other-reports of transfer are analyzed and a time lag between surveys is applied would provide further evidence regarding these results.

Second, related to the study using self-reports, the outcome variable of perceived training transfer reflects primarily on the respondents' perceptions about their transfer. Per Blume et al.'s (2010) finding that self-reported transfer measures had moderate correlations with transfer reported by the trainees' supervisors and peers (i.e., ρ = .26 and .28, respectively), this measure is likely to be correlated with trainee's actual transfer. However, future research with more objective assessment or ratings from others (e.g., from supervisors or peers) would be needed to confirm this. Third, the measurement of the level of voluntary participation was an important step towards a deeper understanding of the complex motivational nature of initial training participation, but further exploration with a more sophisticated measure would be useful.

Fourth, this study focuses on open skill training so caution should be exercised in generalizing the findings to closed-skill programs. For example, previous research by Laker

and Powell (2011) and Massenberg et al. (2017) has suggested differences in several aspects (e.g., motivational dynamics and managerial support) between closed/hard-skill and open/soft-skill training programs. Furthermore, as stated in the SDT literature, autonomous motivation has more impact on performance in relation to complex tasks, while there is no difference between autonomous and controlled motivation on mundane tasks (Gagné & Deci, 2005). Therefore, closed or hard-skill programs (e.g., mechanic maintenance training) would require additional research before generalizations could be made from our study's findings.

Fifth, while our sample may be more generalizable across company cultures and fields since we were able to obtain responses from multiple companies, care should be taken when generalizing across countries. Yang et al. (2009) argue that national culture could have an important effect on learning and transfer because its social nature is dependent on the cultural context (values, beliefs, and social norms). However, the limited amount of available published studies that investigated cross-cultural comparisons in important predictors of training transfer have yet to identify significant differences between national cultures (e.g., Richter & Kauffeld, 2020; Yaghi & Bates, 2020). Although these studies do not support the general assumption that national culture has a significant impact on training transfer, underlying mechanisms related to transfer may differ between national cultures (Yaghi & Bates, 2020).

III/5. CONCLUSION

This study is one of the first to consider the level of voluntary participation as a multidimensional construct and investigate its effect on motivation to transfer and perceived training transfer across multiple companies. It adds a piece toward solving the puzzle of prior conflicting findings regarding whether mandatory or voluntary participation leads to better training transfer. Our results demonstrate the importance of considering how voluntarily trainees participate in training, and how supervisor support is especially important for training programs that are required by the organization/manager. These findings are instructive for organizations considering how to offer and frame training programs, and how to provide managerial support for these employees. Although the findings of the present study demonstrate the benefits of moving away from a dichotomous participation approach towards a more nuanced continuum of voluntary participation, further exploration of this continuum is needed in future research.

IV. THE MODERATING EFFECT OF COWORKERS' TRAINING PARTICIPATION ON THE INFLUENCE OF PEER SUPPORT IN THE TRANSFER PROCESS (STUDY 2)[7]

ABSTRACT

Purpose: The impact of the number of coworkers participating in training on transfer outcomes has largely been overlooked. We examine whether the number of coworkers participating in training interacts with peer support to influence training motivation and transfer.

Design/methodology/approach: Data were collected using a cross-sectional survey from a sample of 688 employees working in fourteen midsize and large companies. All participants were recent trainees in various open skill (e.g., leadership) training programs. Moderated mediation was utilized to test the hypotheses.

Findings: Motivation to transfer mediated the relationship between peer support and perceived training transfer. When more coworkers participated in the training, peer support had a stronger influence on trainee motivation to transfer.

Originality: This was the first study to demonstrate that the number of coworkers participating in training can moderate the effect of peer support on motivation to transfer and training transfer.

Practical implications: Organizations should consider training coworker cohorts at the same time to influence motivation to transfer and training transfer. Generally, whole-team training programs could be used to boost training transfer outcomes, although it could potentially have a negative impact on transfer if peer support is low.

Keywords: coworkers' training participation, training cohort, peer support, motivation to transfer, training transfer, latent moderated mediation

Paper type: Research paper

[7] 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

IV/1. INTRODUCTION

To maintain competitive advantage, organizations are compelled to train and develop employees and managers (Noe & Tews, 2012; Reio, 2020). The necessary training is often being fulfilled by providing corporate training programs. Regardless of their targeted skills, organizations need to ensure that the significant amount of dedicated resources invested into workforce training leads to a return on investment (i.e., in the form of individual and organizational benefits). For ensuring these benefits, it is essential for participants to transfer the training by applying the newfound knowledge, skills, and attitudes on the job (Baldwin & Ford, 1988; Burke & Hutchins, 2007; Ford et al., 2018). The study of the training transfer process has identified factors that are associated with successful training transfer (c.f. Ford et al., 2018; Kraiger & Ford, 2021). Among these well-established factors, peer support has received ample research interest, and its positive effect on training transfer is supported by several previous studies (Ford et al., 2018; Massenberg et al., 2015). Despite the well-known importance of peer support, the potential moderating effect of how many coworkers participate in the training has largely been overlooked. Yet this aspect of the training programs may be important in that the number of peers participating in the training could enhance the influence of peer support. If this is the case, organizations could more closely consider the impact of coordinating coworker training programs. Since training coworker cohorts at the same time may be relatively easy for organizations to implement, this could be a way to increase the positive effect of peer support on training transfer.

This study aims to address this research gap and investigate the impact of the number of coworkers participating in training on the training transfer process. In the proposed conceptual model (Figure 1), it is assumed that the number of coworkers participating in training influences the positive relationship between peer support and both motivation to transfer and training transfer. Below, we outline the hypotheses and underlying theoretical background based on the proposed model.

IV/1.1. Peer support, motivation to transfer, and training transfer

The importance of the social environment in work-related factors has been recognized by researchers of health and social psychology for decades. In their meta-analytic study, Humphrey et al. (2007) provided evidence for the positive relationship of social support with beneficial aspects of work like job-satisfaction, work motivation and performance. Social

support can be defined as "the extent to which a job provides opportunities for getting assistance and advice from either supervisors or coworkers" (Humphrey et al., 2007, p. 1336). Similarly, social support is found to be an important antecedent of both motivation to transfer (e.g., Gegenfurtner et al., 2009; Richter & Kauffeld, 2020; Seyler et al., 1998) and training transfer (Blume et al., 2010; Burke & Hutchins, 2007; Ford et al., 2018). The important role of social support (e.g., peer/workgroup support, supervisor support) was identified in the early empirical work of Ford et al. (1992), Facteau et al. (1995), Holton et al. (1997), and Bates et al. (2000). Moreover, Hughes et al. (2020) in their recent meta-analysis demonstrated that social support could account for 32% of the variance in transfer. Previous studies differentiated social support types by their sources (e.g., top management, organizational, supervisory, peer, and subordinate support; Facteau et al., 1995; Tracey et al., 2001) and their supportive functions (e.g., instrumental, informational, emotional, and appraisal support; House, 1981). According to Hughes et al. (2020), organizational support, supervisor support, and peer support each have a unique contribution to training transfer. Although several studies demonstrated that support provided by different sources has an important effect on the transfer process, the current study solely examines peer support with a focus on its relation to the number of coworkers participating in training.

Previous studies have proposed that social support may not directly cause the occurrence of behavior but rather functions as an environmental trigger that exerts its effect through increased motivation (Baldwin & Ford, 1988; Gegenfurtner et al., 2009). The prominent role of motivation in performing a behavior is highlighted in several models and theories of behavior change (cf., Michie et al., 2014). Similarly, motivation to transfer – defined as the "trainees' desire to use the knowledge and skills mastered in the training program on the job" (Noe, 1986, p. 743) – has been found to be a key determinant of training transfer (Axtell et al., 1997; Baldwin & Ford, 1988; Gegenfurtner et al., 2009). Van den Bossche et al. (2010) found evidence for the partially mediating effect of motivation to transfer between the feedback provided by the work-related social network (i.e., peer support) and training transfer. Similarly, Bhatti et al. (2013) and Massenberg et al. (2015) found that motivation to transfer fully mediated the effect of training interventions between peer support and training transfer.

The first hypotheses serve as a foundation for this study and are directly based on these previous findings in the training transfer literature:

Hypothesis 1a. *Peer support is positively related to perceived training transfer.*

Hypothesis 1b. *Peer support is positively related to motivation to transfer.*

Hypothesis 1c. *Motivation to transfer is positively related to perceived training transfer.*

Hypothesis 1d. *Motivation to transfer mediates the effect of peer support on perceived training transfer.*

IV/1.2. Coworkers' training participation

The training transfer literature differentiates two main categories of training programs regarding the amount of team members participating in the program. Individual training (i.e., the training of individuals) refers to the programs where training participants attend the program independently from their teams, mainly with other members of the organization. In contrast, intact-team training or whole-team training refers to the interventions where all team members participate on the same program together (Kozlowski & Ilgen, 2006; Mathieu et al., 2008). Training transfer studies support the impact of peer support and motivation to transfer on training transfer for training directed at individuals (Blume et al., 2010; Burke & Hutchins, 2007; Ford et al., 2018; Gegenfurtner et al., 2009), and there is also supporting evidence for similar patterns in whole-team training interventions (e.g., Massenberg et al., 2015). Cannon-Bowers et al. (2003) assumed that team members can increase transfer by providing the opportunity to model and reinforce the trained behavior. They also argue that the transfer of whole-team training programs could be even more successful since team members can provide mutual support.

While previous research shows or assumes a similar mechanism and important antecedents in both individual and team transfer processes, empirical evidence is lacking on whether there is a difference on transfer outcomes when employees participate in training alone, with some coworkers, or with all coworkers. The literature suggests that training programs targeting task-relevant skills are more effective when directed to individual team members, while the programs targeting knowledge, skills, attitudes necessary for effective team functioning are best to be delivered to whole-teams (Mathieu et al., 2008). The

reasoning behind these assumptions is that whole-team training programs provide the opportunities for participants to integrate and jointly practice their newly acquired skills (Mathieu et al., 2008). Although the underlying logic of this assumption is clear, empirical evidence is needed.

The advantage of whole-team training over training directed at individuals can be explained by different theoretical frameworks. According to the social information processing perspective (Salancik & Pfeffer, 1978), an individual's attitude is formed by cues from their social environment beyond their own past behaviors and experiences. For example, an employee's attitude about using a new software is influenced by peer opinions shared with him at lunch. These social cues can affect attitudes in four different ways. First, overt statements and observable behavior of other people directly cues attitudes (e.g., coworker says: "I don't like this training."). Second, social influence directs the attention of individuals on certain aspects of favorable or unfavorable information, shifting their attitude towards the direction that the social cue made more salient (e.g., coworker says: "This part of the training is useful."). Third, the social environment also forms attitudes by providing interpretations of environmental cues such as events, job characteristics, and behavior (e.g., coworker says: "I can use this technique when I negotiate with my clients."). Lastly, it shapes the interpretation of individual needs, highlighting the presence or absence of specific aspects that should be important to the person (e.g., coworker says: "We could not manage these sort of client complaints, we badly needed this part of the training."). These are four ways that social cues from peers in the training environment could impact trainee perceptions.

The multiple pathways of social influence (direct, attentional, interpretation, and learning pathways; Grant et al., 2010; Salancik & Pfeffer, 1978) indicate that the knowledge, skills, and attitudes that are targeted in a training program should be acceptable by the social environment and fit into its norms to promote application. When more coworkers participate in a training program, it is likely that the coworkers' direct experience with the training content makes their reactions more observable, and these social cues and the impact of the social environment will have a stronger impact on trainees' motivation and attitudes. For example, coworkers' reactions and behaviors would be more directly observable and more likely to lead to shared interpretation and learning pathways for the trainee. For these reasons,

we expect that trainees will have a higher motivation and willingness to transfer the training when a higher percentage of those in their social environment are also receiving training.

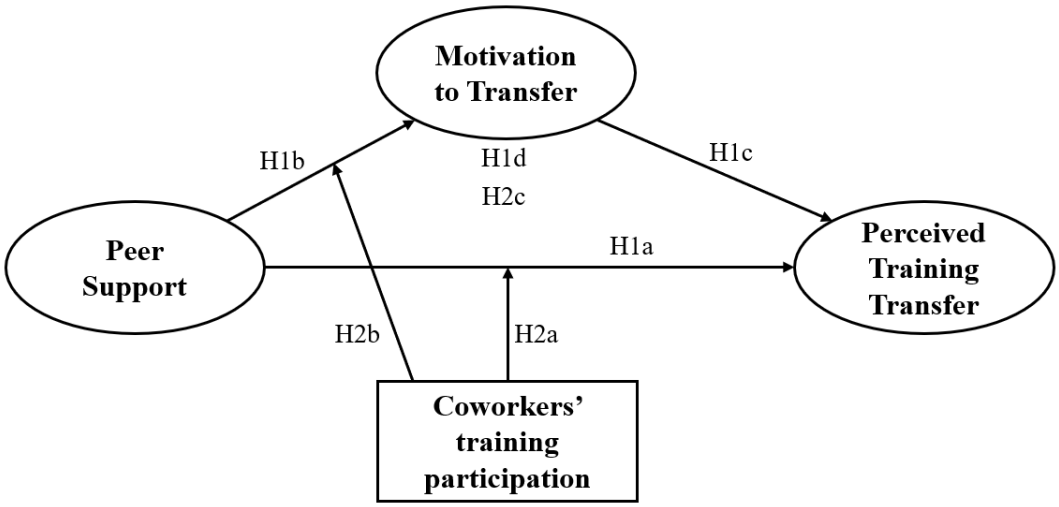
Furthermore, a broad social consensus about the targeted skills is essential for ensuring that more people are able to provide relevant and useful feedback, which were found to be crucial for successful behavior change and training transfer (Van den Bossche et al., 2010). The amount of feedback and peer support are also found to increase motivation to transfer (e.g., Kirwan & Birchall, 2006; Van den Bossche et al., 2010). According to Russ-Eft (2002), the information provided by the feedback allows the learner to compare their current and the desired behavior, which increases their motivation to dedicate more effort to change their behavior. Additionally, Gilpin-Jackson and Bushe (2007) highlighted the positive effect of observing the on-the-job application of the learned skills that would likely occur more frequently if coworkers participated in the training program. Based on the Social Cognitive Theory (Bandura, 1986), these observations not only increase the observers' knowledge acquisition via vicarious learning, but also have a positive impact on their motivation to perform the behavior.

While the current study is the first that we are aware of to examine the effect of the different number of coworkers participating in training, based on the above reasoning and theoretical backgrounds, we propose the following regarding the moderating role of the number of coworkers participating in training:

Hypothesis 2a. *Coworkers' training participation moderates the relationship between peer support and perceived training transfer; such that the effect of peer support on perceived training transfer will be stronger when more coworkers participate in the training.*

Hypothesis 2b. *Coworkers' training participation moderates the relationship between peer support and motivation to transfer; such that the effect of peer support on motivation to transfer will be stronger when more coworkers participate in the training.*

Hypothesis 2c. *Coworkers' training participation moderates the motivation to transfer mediated effect of peer support on perceived training transfer in such a way that the positive, mediated effect is stronger when more coworkers participate in the training program and weaker when fewer coworkers participate in the training.*



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

IV/2. METHOD

IV/2.1. Procedure and Participants

The study was conducted in accordance with the Declaration of Helsinki, approved by the Institutional Review Board of the Eötvös Loránd University Faculty of Education and Psychology, and is in line with the EU General Data Protection Regulation (2016). Data collection was conducted in fourteen mid- to large-size Hungarian companies. The invitation letter to participate in the study was sent to employees who had attended a training program in the prior six months. Voluntary participation was encouraged by a lottery drawing that awarded a total of 150 small prizes, each worth about $15.

From a total of 864 survey respondents, the final sample included those who participated in a company-organized, open/soft-skill training program (e.g., leadership development, assertive communication, time management, sales, stress management) and who responded to the survey between 13 and 120 days after training. With the chosen timeframe, participants had at least two weeks after the classroom session to transfer the training to their job, and less than four months after training to ensure that the training was recent enough to accurately recall relevant aspects of the transfer process. In the online

survey, respondents were instructed to consider the last training program in which they participated.

The final sample consisted of 688 working adults (48% female) who were between 22 and 67 years old (M_{age} = 39, SD_{age} = 8.88). Regarding their organizational levels, 403 (58.6%) worked at a non-managerial level whereas 285 (41.1%) worked at a managerial level. The fourteen participating companies (workforce ranged between 500-15,000 employees) operate in the accounting, automotive, chemical, energy, financial, insurance, pharmaceutical, retail, and telecommunications sectors. Detailed company characteristics are shown in Table S1 at the online supplementary materials on the project's OSF page: https://osf.io/kf9yn/?view_only=a654da486f67403f8c35a88d1f3a432c. A study that used a subset of the current database has been published (Salamon, Blume, et al., 2021). However, the present study contains significantly more data, focuses on distinct research questions, and includes different predictor and moderator variables.

IV/2.2. Measures

Data collection was conducted in Hungarian. To support the potential application of the shared materials in future research, the original materials were translated into English, following a standardized translation-back translation protocol proposed by Beaton and colleagues (2000). The full questionnaire and related materials are available on the project's OSF page: https://osf.io/kf9yn/?view_only=a654da486f67403f8c35a88d1f3a432c. Items/responses for the first three measures listed below were provided on a seven-point Likert-scale (1=Not true at all, 7=Completely true).

Perceived Training Transfer (outcome). To assess the application of learned techniques on the job, a four-item scale from Salamon, Blume et al. (2021) was used. The items reflect a topic-independent, general behavior transferred to the job (e.g., "At my workplace, I applied the methods acquired during training."; α = .96).

Peer Support (predictor). 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. The items were formulated based on Holton et al.'s (1997, p. 110) definition of peer support (i.e., "the extent to which peers reinforce and support the use of

learning on the job"). A sample item is "My coworkers encouraged me to use what I learned at the training." This scale had good reliability (α = .87).

Motivation to Transfer (mediator). A three-item scale from Salamon, Blume et al. (2021) was used to measure participants' motivation to transfer the new techniques after the training (e.g., "By the end of the training, I was determined to use the new techniques I learned at the training."). This measure has strong theoretical and empirical underpinnings (e.g., Nijman & Gelissen, 2011) and reliability was good (α = .92).

Coworkers' training participation (moderator). Respondents were given the following four options and indicated whether their direct colleagues (with whom they work daily) participated in the same training program: "Yes, almost all of my direct colleagues participated in this training (in the same training session)"; "Yes, some of my direct colleagues attended this training (in the same training session)."; "Yes, my colleagues participated in this training before (but in a different training group)."; "No, I was the only one to participate in this training among my direct colleagues." From these four response options a three-level scale was created by combining the two response options indicating that "some" coworkers participated in the training program. The final scale reflected three levels of coworkers' training participation, including none, some, and nearly all.

Time lag (control). In line with the suggestion of Taylor, Russ-Eft and Taylor (2009), Salamon, Blume et al. (2021) found that participants reported less motivation to transfer when more time had passed after training. Consequently, 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.

Organizational level (control). According to Chen et al. (2006), the job type or position in the organizational hierarchy can have an effect on the perceived transfer-related variables such as motivation to transfer. Furthermore, Salamon, Blume et al. (2021) found that trainees from higher organizational levels reported higher perceived training transfer. Respondents indicated their positions and we classified these as either employee-level or manager-level.

IV/Table 1. Standardized Parameter Estimates from the Preliminary Model

	PS (λ)	MTT (λ)	TT (λ)	δ
Peer Support (PS)				
Item 1. My coworkers encouraged me to use what I learned at the training.	.871**			.241
Item 2. My colleagues helped me when I had difficulties applying the new methods I had learned during training.	.871**			.241
Item 3. I regularly talked with my colleagues about how to best utilize the methods I had learned.	.757**			.427
Motivation to Transfer (MTT)				
Item 1. After completing the training, I was excited to use the techniques I learned there.		.902**		.187
Item 2. By the end of the training, I felt that I would love to use what I learned immediately in my job.		.896**		.197
Item 3. By the end of the training, I was determined to use the new techniques I learned at the training.		.869**		.245
Perceived Training Transfer (TT)				
Item 1. In my workplace, I used what I learned during the training.			.920**	.153
Item 2. I tried the techniques at work I had learned at the training.			.922**	.151
Item 3. At my workplace, I applied the methods acquired during training.			.952**	.094
Item 4. In my day-to-day work, I implement the knowledge that I had acquired at the training.			.893**	.202
ω	.873	.919	.958	
AVE	.696	.791	.850	

Notes. *$p < .05$, **$p < .01$; λ = Factor loading; δ = Item uniqueness; ω = model-based omega composite reliability; AVE = average variance extracted.

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 (see Figure 1) 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 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). Furthermore, we calculated model-based composite reliability indices (ω; McDonald, 1970) which may better represent the construct, relative to Cronbach's alpha, by estimating reliability from the factor loadings and their respective measurement errors. To establish convergent validity on the construct level we calculated average variance extracted (AVE) of the constructs. Moreover, to detect any potential problems regarding discriminant validity we used Heterotrait-monotrait (HTMT) ratio analysis (Henseler et al., 2015). Finally, we estimated the variance inflation factor (VIF) for the predictor, mediator, and moderator to detect potential issues of multicollinearity.

Within R 4.0.5 (R Core Team, 2020), the *tidyverse* package (version 1.3.0.; Wickham et al., 2019) was used for data transformation and visualization, *lavaan* package (version 0.6-8; Rosseel, 2012) for structural equation modeling and calculating the omega composite reliability indices, *semTools* package (version 0.5–4; Jorgensen et al., 2021) for conducting moderated mediation analysis. The data, a more detailed analytic plan, and the analysis code can be found on the project's OSF page: https://osf.io/aw2kg/?view_only=a654da486f67403f8c35a88d1f3a432c.

IV/3. RESULTS

IV/3.1. Preliminary Analyses

The goodness-of-fit indices showed excellent fit of the preliminary factor analytic model (χ^2=106.916, df=46, CF =.987, TLI=.982, RMSEA=.044 [90% CI .034, .054]). Parameter estimates (reported in Table 1) revealed well-defined and reliable factors for peer support (λ=.757 to .871, ω=.873, AVE = .696), motivation to transfer (λ=.869 to .902, ω=.919, AVE = .791), and training transfer (λ=.893 to .952, ω=.958, AVE = .850). Furthermore, the results of the preliminary analyses show that our constructs were distinct (highest HTMT ratio = .799; values reported in Table S2 at the online supplementary materials) and as VIF values did not exceed the threshold of 5 (highest VIF = 1.198), multicollinearity was unlikely a problem (Hair et al., 2018; Henseler et al., 2015). Bivariate correlations from the preliminary measurement model are reported in Table 2.

IV/Table 2. Descriptive statistics and bivariate correlations between latent variables

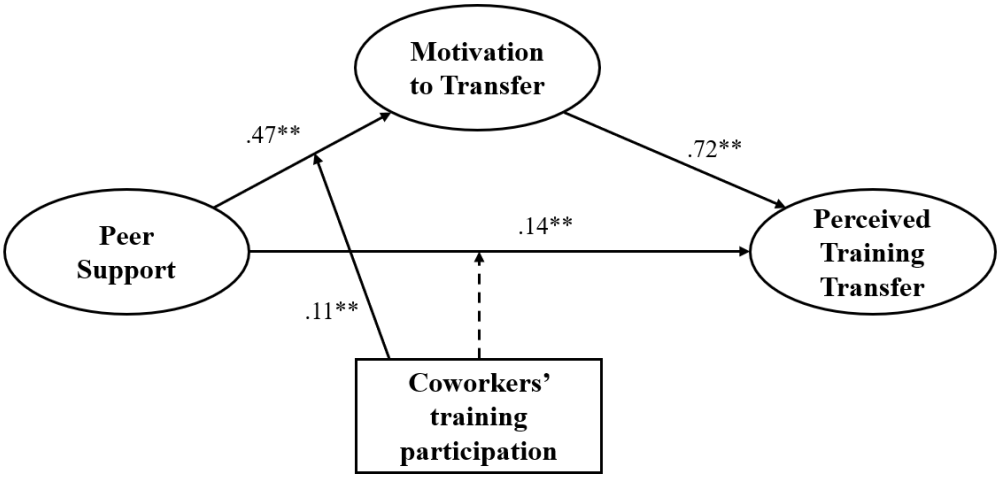
	M	SD	1	2	3	4	5
1. Organizational level	0.41	0.49	–				
2. Time lag (days)	51.51	29.13	.03	–			
3. Coworkers' participation	0.67	0.61	.04	.06	–		
4. Peer Support	3.30	1.55	.14**	.07	.32**	–	
5. Motivation to Transfer	5.09	1.38	.05	–.06	.06	.44**	–
6. Perceived Training Transfer	5.00	1.38	.12**	–.03	.10*	.47**	.79**

Notes. N=688, Time lag (days): Days elapsed between training and data collection.

*p < .05; **p < .01.

IV/3.2. Main analyses

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 2 and the parameter estimates are presented in Table 3. 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 2. 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.

IV/Table 3. Summary table of the parameter estimates from the latent moderated mediation model

Hypothesis	Involved variables	b	SE	[95% CI]	*β*	*p*
H1a	Peer support → TT	.237	.049	[.134, .324]	.14	< .001
H1b	Peer support → MTT	.535	.052	[.432, .635]	.47	< .001
H1c	MTT → TT	1.061	.090	[.902, 1.247]	.72	< .001
H1d	Peer support → MTT → TT	.567	.069	[.438, .696]	.34	< .001
H2a	Peer support × CTP → TT	–.012	.041	[–.093, .069]	–.01	.776
H2b	Peer support × CTP → MTT	.128	.044	[.043, .217]	.11	.004
H2c	Peer support × CTP → MTT → TT	.136	.049	[.046, .244]	.08	.006
Control	Time lag → MTT	–.104	.040	[–.186, –.029]	–.09	.010
Control	Time lag → TT	.008	.044	[–.076, .100]	.01	.854
Control	Organizational level → MTT	–.012	.042	[–.106, .061]	–.01	.777
Control	Organizational level → TT	.105	.043	[.022, .188]	.06	.016

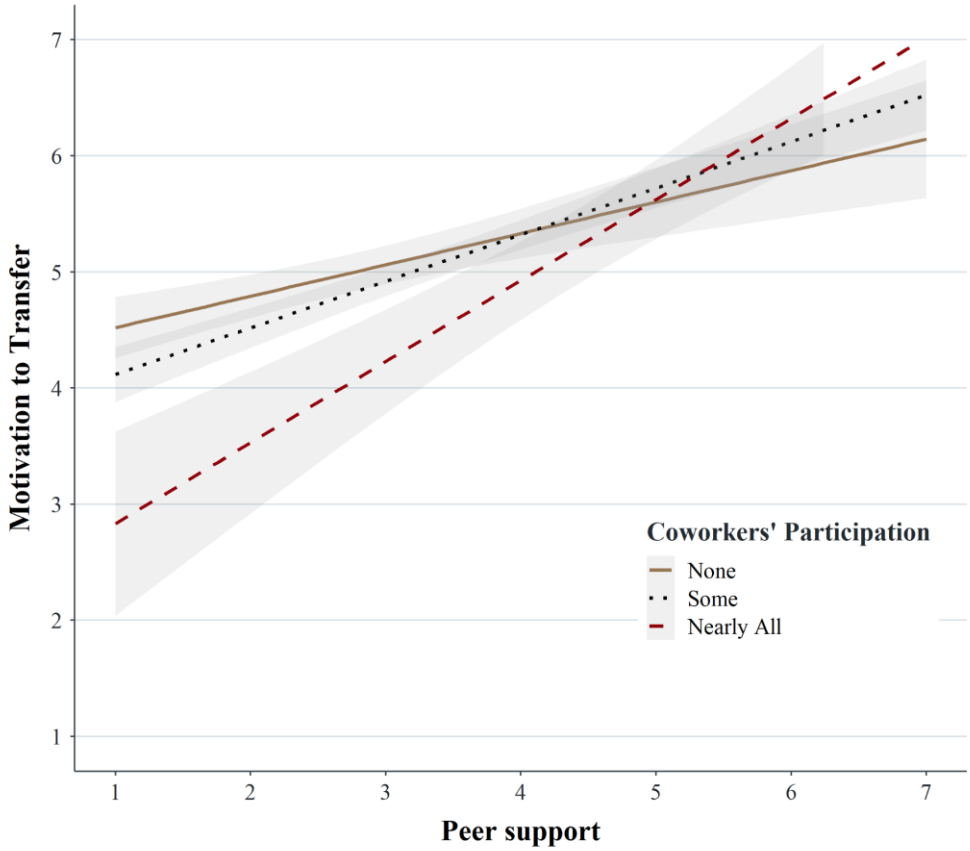
Notes. The table represents unstandardized (b) and standardized (*β*) parameter estimates with standard errors (SE), and 95% bias-corrected bootstrapped confidence intervals ([95% CI]). N=688; MTT=Motivation to Transfer, TT=Perceived Training Transfer, CTP=Coworkers' training participation; Time lag: Days elapsed between training and data collection.

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 3) 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 3. 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. 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. This is likely related to the shared understanding and attitude about the knowledge, skills, and attitude targeted in the training program. The results suggest that the positive effect of peer support and motivation to transfer on training transfer can be increased by more coworkers participating in training. A higher percentage of coworker participation can increase shared understanding, the positive attitude towards the targeted behavior, the opportunity to observe the target behavior on-the-job, and can strengthen the on-the-job feedback loop. These results are in line with the assumptions of prior studies that emphasized the advantages of whole-team training programs compared to training programs directed at individuals (e.g., Mathieu et al., 2008). However, the results also show that training interventions which target nearly all coworkers could also have an undesirable effect. For example, when there is a high percentage of coworkers participating in the training, but participants do not experience support from their peers, it can negatively affect employees' motivation to transfer.

IV/4.1. Theoretical and Practical Implications

The present study aimed to investigate how the number of coworkers participating in training impacts the relationship between peer support, motivation to transfer and training transfer. The findings address the previous research gap and are in line with the Social Information Processing Theory (Salancik & Pfeffer, 1978), which emphasizes the important role of the social context in attitude formation and the occurrence of a behavior. Based on this theory, a probable explanation for the moderating effect of coworkers' training participation is that the higher the number of coworkers participating in a training program,

the more information is available about the direct environments' attitude (acceptance or refusal) regarding the learned skills. Since high coworker participation in training makes these attitudes more perceptible, it makes it easier for participants to adjust their own attitudes and behaviors to the social consensus or norm. Through direct, attentional, interpretation, and learning pathways (Grant et al., 2010; Salancik & Pfeffer, 1978) these social cues influence participants' attitudes and motivation to transfer the learned skills.

Furthermore, previous studies have shown that employees who participate in a training together with more of their coworkers have a better chance to observe the learned skills that are applied on the job by their coworkers (Gilpin-Jackson & Bushe, 2007). This positive effect of observation on learning and motivation to perform the observed behavior is consistent with the Social Cognitive Theory (Bandura, 1986). Accordingly, the observation of a behavior not only increases the observers' knowledge acquisition via vicarious learning, but also has a positive impact on their motivation to perform the behavior. The results of the current study show that the effect of peer support (e.g., acting/leading by example) on motivation to transfer is stronger when a higher number of coworkers participate in a training program. On the one hand, this result implies that when participants receive support and observe the trained skills performed by their coworkers, they will also be motivated to apply those skills. On the other hand, participants' motivation can be diminished if they do not receive support from their coworkers and do not observe their coworkers implementing these learned skills to the job.

In the present study, 40% of the respondents participated in the training independent from the majority of their direct workgroup. This means that their coworkers likely had less knowledge or information about the topic, which could reduce their ability to provide support or motivation for training transfer (e.g., encouraging; modeling behavior; providing positive and developmental feedback). Previous research has shown that providing relevant and useful feedback is critical for successful training transfer (Van den Bossche et al., 2010). However, in order to provide useful and relevant feedback, a broad social consensus, common knowledge, and positive attitude related to the targeted training is important. Whole-team training interventions can contribute to the learning of these shared models in the workgroup (Mathieu et al., 2005).

In addition, the results also show that, on average, respondents did not experience high levels of peer support. Looking more closely at the extent of peer support, the results show that it is the lowest when no coworkers participate in a training, moderate when some coworkers participate, and the highest level of peer support is shown when nearly all coworkers participate in a training program. The fact that whole-team training programs show higher levels of peer support highlights an important area for managers to focus on when they are looking for ways to enhance the transfer of training. It is likely that organizing and delivering training programs for employees who work together daily will increase the understanding, positive attitude, knowledge, and skills of these teams/coworkers. This can lead to increased peer support, motivation to transfer, and training transfer.

It is important to note that training programs which target nearly all coworkers without a supportive performance environment could result in worse effects on motivation to transfer than training programs directed at individuals in a similarly non-supportive environment. This may occur if the negative attitudes of peers towards the training negatively influence trainee motivation to transfer and transfer. However, participating alone or with only a couple others from a workgroup means that the knowledge about the targeted skills and the useful feedback loop is less likely to exist when the transfer attempts occur. According to Kozlowski (2018, p. 210) whole-team training programs "are key interventions for enhancing team processes and effectiveness, but the extent to which they are used routinely by organizations (outside of the military) is limited. This is an extraordinary untapped opportunity to enhance organizational effectiveness across a broad swath of the economy." Given the above points, it seems especially important in these programs to ensure the necessary peer support will occur and to be cautious if there are negative attitudes towards training. To offer and deliver effective training programs that are useful to trainees, practitioners can follow findings and suggestions in the HRD literature (cf., Ford, 2020; Kraiger & Ford, 2021). In addition, organizations should consider developing a "feedback-friendly" culture and investing in training supervisors to foster a climate in which psychological safety is high, peers support training transfer, and employees proactively ask for high-quality feedback (Facteau et al., 1995; van der Rijt et al., 2012).

IV/4.2. Limitations and Future Research

While the current study has several strengths (e.g., data collection conducted in multiple companies including multiple soft-skill training programs), there are also several limitations that should be considered in interpreting these findings. First, the current study included soft-skill training programs where workgroup support is especially important (Blume et al., 2010). Consequently, the generalizability of the findings to hard-skill training programs requires further research investigation.

Second, this study was cross-sectional with self-report measures, limiting causal interpretation of the investigated relationships. However, the implemented procedural remedies of common method variance (Podsakoff et al., 2012; Reio, 2010) incorporated into our study could alleviate the concerns of these problems. The issue of common method variance is probably the most relevant in connection with the first hypotheses (H1a-H1d), where these relationships have been supported by several previous studies (c.f., Blume et al., 2010; Ford et al., 2018). In addition, self-report data collection is more acceptable regarding variables that measure respondents' internal states, such as the perceived support and motivation to transfer variables in this study (Spector, 2019). Furthermore, the other hypotheses tested interaction effects, and research suggests that although interaction effects can be deflated by method bias, they are unlikely to be artifacts of it (Podsakoff et al., 2012; Siemsen et al., 2010). Nevertheless, replication of the study in conditions where other-reports of transfer are analyzed and a time lag between surveys is applied would provide further evidence.

Third, the coworkers' training participation moderator variable had unequal subgroup sample size. Forty percent of the respondents participated were the only one in their direct workgroup to participate in the training program, 52% of the respondents had some coworkers who also participated in the training program, and only 8% of the respondents indicated that nearly all their coworkers participated in the training program. As the unequal sample sizes can significantly decrease the power to detect the effect of a moderator variable (Aguinis, 1995), it could be a potential reason for the non-significant effect of the number of coworkers participating in training on the relationship between peer support and training transfer. Consequently, to handle this issue, future research that investigates similar relationships should aim for more equal subgroup sample sizes (Aguinis, 1995).

A promising direction for future research would be to investigate the individual characteristics and contextual factors that may moderate the effect of the number of coworkers' training participation on transfer outcomes. Self-monitoring is an example of a trainee characteristic that could moderate the influence of coworkers' training participation in the transfer process. The extent of self-monitoring was found to be an important moderator of social adjustment. High self-monitoring individuals are more sensitive to and tend to follow social norms, whereas low self-monitors are more likely to follow their internal attitudes and beliefs to guide their behaviors (Snyder, 1974; Burkhardt, 1994). Another important variable in connection with the effect of social cues is related to self-identity variables like organizational or workgroup identification (Chen et al., 2013).

An additional direction for future research could be to explore the percentage of coworkers as training participants required to have high peer support. For example, is it necessary for 100% of coworkers to participate, or could 50% or 75% of a team training participation still provide a positive environment of peer support to facilitate trainee motivation and transfer? A related question is whether the percentage of coworkers (i.e., the ratio of the social environment affected by the training initiative) or a specified 'high' number of coworkers has more impact on the effect of peer support in the transfer process. Furthermore, while the current study assumed that each coworker would have the same effect on a trainee, future research could consider investigating how certain peers may have a larger influence on a group (Chen et al., 2013). For example, these could consider the impact of a coworker's network position (social network approach) or the different quality of relationships, such as their strength and influence (relational approach). It can be assumed that the following statement is applicable in the context of training transfer: "those who are socially more important will exert a greater influence on the focal employee than others" (Chen et al., 2013, p. 1621). Furthermore, future research would be necessary to provide further information regarding the reasons for the presence or absence of peer support in a work environment.

IV/5. CONCLUSION

The present study unveiled an important but relatively neglected aspect of training programs. In line with theory that emphasizes the impact of the social context on individuals' attitudes and learning, the results show that when more coworkers from a team participate in a training, peer support has a stronger influence on motivation to transfer. Therefore, organizations should consider how the decision of when to train coworkers may influence transfer outcomes; and they should consider training cohorts at the same time.

V. HAVING THE CAKE AND EATING IT TOO: FIRST-ORDER, SECOND-ORDER AND BIFACTOR REPRESENTATIONS OF WORK ENGAGEMENT (STUDY 3)[8]

ABSTRACT

Even though work engagement is a popular construct in organizational psychology, the question remains whether it is experienced as a global construct, or as its three components (vigor, dedication, absorption). The present study thus contributes to the ongoing scientific debate about the dimensionality of work engagement systematically compared 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). We also documented the validity evidence of the most optimal representation based on its test-criterion relationship with basic psychological need fulfillment at work, turnover intentions, work addiction, and work satisfaction. Based on responses provided by two distinct samples of employees ($N_1 = 242$, $N_2 = 505$), our results 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. This representation replicated well across the two samples through tests of measurement invariance. Finally, while global work engagement was substantially related to all correlates, the specific factors also demonstrated meaningful associations over and above the global levels of work engagement.

Keywords: work engagement; validity evidence based on test-criterion relationship; bifactor-CFA; work addiction; work satisfaction; basic psychological needs

[8] 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

V/1. INTRODUCTION

Following the changes in work conditions and technological advancements over the last decades, employees invest more and more time and energy in their work (van Beek et al., 2012). This heavy work investment can be conceptualized in the form of work engagement which has been described as a positive and fulfilling, work-related state of mind (Schaufeli et al., 2002) characterized by three components: vigor (i.e., having high levels of energy during work), dedication (i.e., perceiving work as being important and meaningful), and absorption (i.e., being immersed in work). Work engagement is thus a high activation state of mind that is associated with pleasant work-related emotions (Bakker & Oerlemans, 2011). Research has generally demonstrated that work engagement is a desirable state of mind that is positively associated with psychological health (Gillet et al., 2019; Simbula et al., 2013), psychological capital (Mills et al., 2012), occupational self-efficacy (Simbula et al., 2013; Villotti et al., 2014), passion at work (Tóth-Király et al., 2021), work performance (Alessandri et al., 2015; Gorgievski et al., 2010), personal development (Simbula et al., 2013), organizational commitment (Hallberg & Schaufeli, 2006), and job satisfaction (Schaufeli et al., 2019; Wefald et al., 2012).

Despite these findings, the dimensionality of work engagement remains questionable and is frequently investigated in the scientific literature, with two perspectives being prevalent. The first perspective (e.g., Balducci et al., 2010) proposes that the three specific components of work engagement are experienced separately, while the second perspective (e.g., Alessandri et al., 2015) proposes that work engagement is often experienced holistically, as a global construct. The present study was designed with the aim of bringing together these two diverging perspectives by showing that one can "have the cake and eat it too"; that is, one could simultaneously take into account the global and specific nature of work engagement. To achieve this goal, we first compared alternative first-order, second-order, and bifactor confirmatory factor analytic (CFA) models of the 9-item Utrecht Work Engagement Scale (UWES-9; Schaufeli et al., 2006) across two distinct samples of Hungarian[9] employees to identify the most adequate representation of work engagement.

[9] We carried out this study in Hungary which provided us with a unique context for multiple reasons. First, recent national surveys show that Hungarian people spend a lot of time with work, around 43-44 hours per week (Kun et al., 2020; Urbán et al., 2019). Second, at the same time, Hungarian employees are substantially less

Second, via tests of measurement invariance, we investigated the generalizability of the most optimal representation across the two samples. Third, we investigated the relations between this improved representation and key work-related correlates of work engagement, namely basic psychological need fulfillment at work, turnover intentions, work addiction, and work satisfaction.

V/1.1. The Dimensionality of Work Engagement

While the 17-item Utrecht Work Engagement Scale (UWES-17) was developed first by Schaufeli et al. (2002) as a measure of work engagement, the present study focuses on the shorter, 9-item version (UWES-9, Schaufeli et al., 2006) whose factor structure was investigated in numerous studies and validated in many countries. We were able to identify a total of 33 independent studies that investigated the factor structure and reliability of the UWES-9 (more details are provided in Table S1 in the online supplements). These studies were conducted in a large variety of nations (e.g., the Netherlands, Sweden, South Korea, United States, Italy) using samples that differed not just in size, but age composition as well. Generally speaking, these studies showed that the specific components of work engagement (i.e., vigor, dedication, and absorption) had at least moderate levels of internal consistency in some studies (e.g., Chaudhary et al., 2012), but also satisfactory levels of internal consistency in most studies ranging between .70 and .92.

Although studies supported the generally adequate reliability of the UWES-9, contradictory findings have been reported about its factor structure and, in turn, the dimensionality of work engagement. Findings in most of the studies (25 out of the 33) align with the first perspective about the specific work engagement components. Consequently, these studies reported support for the three-factor model as the most optimal solution, which incorporated the three intercorrelated specific components of work engagement, but not the global work engagement construct. Based on commonly-used goodness-of-fit indices (such as CFI, TLI, and RMSEA), only nine out of the 25 studies (Breevaart et al., 2012; Fong & Ng, 2012; Lathabhavan et al., 2017; Moreira-Fontán et al., 2019; Nerstad et al., 2009; Panthee

engaged with their work when compared to other European countries (Schaufeli, 2018). This discrepancy (i.e., working a lot but not being engaged with it) thus creates a unique research environment that could provide further insights into the nature of work engagement.

et al., 2014; Schaufeli et al., 2006; Seppälä et al., 2009; Yusoff et al., 2013) reported empirical support for the three-factor solution without any model modification. It is interesting to note that ten studies (Samples 1 & 2 of Ho Kim et al., 2017; Kulikowski, 2019; Littman-Ovadia & Balducci, 2013; Sample 1 of Mills et al., 2012; Petrović et al., 2017; Vazquez et al., 2015; Villotti et al., 2014; Wefald et al., 2012; Zeijen et al., 2018) chose the three-factor solution as the most optimal one even though the three-factor solution in these studies failed to achieve an acceptable level of fit. In the remaining six studies, the authors opted to modify the three-factor solution by including correlated uniquenesses between a subset of items (Samples 1 & 2 of Balducci et al., 2010; Chaudhary et al., 2012; Lovakov et al., 2017; Simbula et al., 2013; Zecca et al., 2015). However, the ad-hoc inclusion of correlated uniquenesses for the artificial improvement of model fit is considered to be problematic without any substantive interpretation of why the uniquenesses of a particular subset of items should be allowed to correlate (Marsh, 2007; Marsh et al., 2010).

Despite studies supporting the relative adequacy of the three-factor solution, it has to be noted that the average correlation between vigor, dedication, and absorption was often so high (ranging from .57 to .97) that it questions the validity evidence based on relations to other variables, specifically discriminant evidence of these components. Consequently, it has been suggested in the literature that the global construct of work engagement, and not its specific components, should be in the focus of investigations. The presence of a global work engagement factor could be investigated in different ways, with the first being the estimation of a one-factor solution that only incorporates a single work engagement factor. Three studies reported this solution as the most optimal model. However, model fit indices were not unanimously adequate in these studies (study 2 of Mills et al., 2012; Vallières et al., 2017). Although the one-factor solution reported by Klassen et al. (2012) was adequate, the inclusion of correlated uniquenesses limits the adequacy of their findings. The fourth study that supported the one-factor solution (Hallberg & Schaufeli, 2006) simultaneously accepted the three-factor solution, while neither model reached an acceptable level of RMSEA.

As a second way of testing the presence of a global construct, Sinval et al. (2018) estimated a second-order model in which a global work engagement factor was responsible for the associations between the three first-order specific factors. However, the fit indices

were marginally acceptable only in one of their samples, and not unanimously acceptable in another sample, suggesting that this particular representation might not be the most optimal.

Psychometrically, however, second-order models have one important limitation: they assume that the ratio of variance explained by the global factor relative to that explained by the specific factors is the same for all items related to the specific first-order factor (Gignac, 2016; Reise, 2012). This proportionality constraint, however, has been shown to be overly strict and rarely verified in practice (Gignac, 2016; Morin, Arens, et al., 2016). Alternatively, bifactor modeling has been proposed as flexible alternative that does not rely on such an unrealistic assumption. More importantly, bifactor modeling makes it possible to directly test the simultaneous presence of a global (G-) factor (i.e., global levels of work engagement underlying responses to all items) and co-existing specific (S-) factors (i.e., unique specificities not explained by the global factor).

To the best of our knowledge, there has only been a single study that tested the adequacy of bifactor solutions. De Bruin and Henn (2013) compared first-order and bifactor solutions and reported a partial bifactor solution (including 1 G- and 2 S-factors) as the most optimal. This partial bifactor model was characterized by a well-defined work engagement G-factor and two more weakly defined vigor and absorption S-factors. The authors did not estimate a third S-factor and argued that all the variance in the dedication items was absorbed by the G-factor, leaving no residual specificity to the dedication S-factor. Other studies relying on the longer version of the UWES also showed the added value of estimating a bifactor representation of work engagement (e.g., Gillet et al., 2018, 2019).

Based on these contradictory findings, there is still a debate on whether work engagement should be measured as a single overarching construct or via its three components. Bifactor modeling appears to be a promising avenue that could bring together the two diverging perspectives and show that work engagement might be characterized by a global dimension *and* co-existing specific components not explained by the global factor. The directly related findings of de Bruin and Henn (2013) and the indirectly-related findings of Gillet et al. (2018, 2019) appear to lend support for our proposition, and allow us to propose the following hypothesis:

Hypothesis 1. *The bifactor representation of work engagement will be the most optimal compared to the alternative first-order and second-order representation and it will replicate well across the two independent samples.*

V/1.2. Validity of Work Engagement based on Its Test-Criterion Relationship

Beyond the structural analysis of work engagement, we also aimed to investigate its validity evidence based on test-criterion relationship (American Educational Research Association et al., 2014). For this purpose, we relied on a diverse set of theoretically relevant work-related constructs that showed meaningful associations with work engagement in prior studies, namely basic psychological need fulfillment at work, turnover intentions, work addiction, and work satisfaction.

Self-determination theory (SDT; Ryan & Deci, 2017), a macro-theory of human motivation, posits that there exist three *basic psychological needs* whose fulfillment is essential for optimal functioning, growth, and health (Deci & Ryan, 2000). The three needs are the need for autonomy (i.e., the experience of personal volition), the need for competence (i.e., the experience of mastery and efficacy), and the need for relatedness (i.e., the experience of having meaningful relationships with others). These needs are also thought to be universal, a proposition that is supported by studies conducted in the field of, for instance, education (Cox & Williams, 2008), health (Tóth-Király, Gajdos, et al., 2019) or sports (Adie et al., 2008). Not surprisingly, the importance of need fulfillment has also been highlighted in the domain of work (for a review, see Van den Broeck et al., 2016). There have been some studies which focused on the associations between work engagement and need fulfillment at work with most studies reporting moderate-to-strong associations between them regardless of relying on global levels of work engagement or its specific components (Shuck et al., 2015; Trépanier et al., 2015; Wang et al., 2018). The same associations remained present when reported between work engagement and basic psychological need fulfillment specific factors (Gillet et al., 2015; Goodboy et al., 2017). However, to the best of our knowledge, there are no prior studies that assessed the relationship between work engagement and need fulfillment while, at the same time, taking into account both their global and specific components.

Turnover intentions have long been regarded as a key variable of interest in organizations given that frequent turnovers imply substantial organizational costs both directly (e.g., constant recruitment and replacement of staff) and indirectly (e.g., the loss of

organizational knowledge and the decrease in productivity; Fernet et al., 2017). Studies so far (Lovakov et al., 2017; Mills et al., 2012; Wefald et al., 2012) have reported moderate and negative associations between global levels of work engagement and turnover intentions, typically varying between -.43 and -.48. Albeit slightly weaker, the same associations have also been reported when studies focused on the three components of vigor (varying between-.38 to -.46), dedication (varying between -.38 and -.51), and absorption (varying between -.31 and -.36).

As a downside of work engagement, *work addiction* has been described as an extreme and unhealthy form of work involvement (Porter, 1996) that is associated with, for instance, psychiatric difficulties (Andreassen et al., 2016) and poorer work performance (Falco et al., 2013). From an organizational perspective (e.g., Schaufeli et al., 2009), work addiction is typically defined as an uncontrollable and compulsive need for excessive work; from a clinical perspective (Griffiths, 2005), work addiction is best understood as a constellation of components of behavioral addictions. However, recent theoretical works (Andreassen et al., 2018) acknowledge that both perspectives refer to the same underlying phenomenon. The relationship between work engagement and work addiction has been extensively investigated. Most prior studies generally showed weak, positive association between work addiction and global levels of work engagement (e.g., Clark et al., 2014; Schaufeli et al., 2019; van Beek et al., 2012) with only a few exceptions which reported either weak negative or non-significant associations (Schaufeli et al., 2019; Zeijen et al., 2018). Results become more nuanced when the specific components of work engagement are investigated. More specifically, studies typically reported work addiction having meaningful associations with the absorption component of work engagement, but not with vigor and dedication (Clark et al., 2016; Schaufeli et al., 2008; van Beek et al., 2012). The association between workaholism and absorption might be attributed to the fact that both engaged workers and workaholics are immersed in their work and might find it difficult to disengage from it.

Finally, the present study also included *work satisfaction* as it is considered to be a positive component of employee's wellbeing at work (Ryan & Deci, 2001) that is informative of employees' functioning (e.g., Faragher et al., 2005). Research focusing on the associations between work satisfaction and global levels of work engagement has generally shown positive relations between them as well as between work satisfaction and vigor (varying

between .41 and .65), dedication (varying between .42 and .73), and absorption (varying between .36 and .58) (e.g., Littman-Ovadia et al., 2014; Schaufeli et al., 2008; Simbula et al., 2013).

Overall, these previous studies allow us to propose the following hypotheses:

Hypothesis 2. *Global levels of work engagement will be positively related to (2a) basic psychological need fulfillment at work, (2b) work addiction, (2c) work satisfaction, and (2d) negatively to turnover intentions.*

Research Question. *Given the lack of prior studies with regards to the validity evidence of work engagement based on its test-criterion relationship of the bifactor representation of work engagement, as well as the distinctness of first-order and bifactor S-factors, we leave it as an open research question whether the S-factors in the bifactor representation will demonstrate any additional associations with the correlates over and above of the G-factor.*

V/2. METHODS

V/2.1. Procedure and Participants

The present study was conducted in accordance with the Declaration of Helsinki and with the approval of the Institutional Review Board of Eötvös Loránd University Faculty of Education and Psychology. Participants for this study were recruited through company mailing lists as well as through social media groups. Potential participants were informed about the content of the online survey and they had to explicitly indicate their intention for participation. Sample 1 was collected in January-September 2018 and Sample 2 was collected in January-April 2019, allowing us to minimize their overlap. Although the online survey did not collect any specific information that would make the identification of the participants possible, a duplicate check was conducted based on the combinations of the collected demographic and job-related information. This procedure showed no duplicates in either of the final databases, suggesting the presence of distinct participants in both samples. In addition, only participants working at the time of the data collection were included in the study (which was ensured by asking participants explicitly to indicate whether they worked at the time they responded to the survey).

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. These samples were not representative of the population of Hungarian working adults. Sample 1, recruited between January-September 2018, 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, recruited between February-April 2019, 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 (three items; e.g. „At my work, I feel bursting with energy"), dedication (three items; e.g. „I am enthusiastic about my job"), and absorption (three items; e.g. „I get carried away when I'm working"). See Appendix 1 in the online supplements for the Hungarian version. Responses were provided on a seven-point Likert-scale ranging from 1 (never) to 7 (always). The UWES-9 was adapted with a standardized translation-back translation protocol proposed by Beaton et al. (2000). Cronbach alpha values for all the factors indicated good internal consistency in both samples, ranging from .88 (absorption) to .90 (dedication) in Sample 1 and from .85 (vigor) to .90 (dedication) in Sample 2.

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 (e.g., „I will likely be looking for a new job soon."). Each item was scored on a five-point Likert-scale ranging from 1 (very uncharacteristic) to 5 (very characteristic). Cronbach's alpha in the present study was .93.

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 (all items started with the clause "At the workplace where I work…"), while the items themselves were used without any modification. The scale measures six factors: autonomy satisfaction (four items; e.g. "I feel that my decisions reflect what I really want."; α = .78), relatedness satisfaction (four items; e.g. "I feel close and connected with other people who are important to me."; α = .78), competence satisfaction (four items; e.g. "I feel I can successfully complete difficult tasks."; α = .70), autonomy frustration (four items; e.g. "My daily activities feel like a chain of obligations."; α = .64), relatedness frustration (four items; e.g. "I feel the relationships I have are just superficial."; α = .78), and competence frustration (four items; e.g. "I have serious doubts about whether I can do things well."; α = .77). Respondents indicated their level of agreement using a seven-point Likert-scale ranging 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 based on the components model of addiction (Griffiths, 2005), including salience, tolerance, withdrawal, mood modification, tolerance, and relapse (e.g., „How often during the last year have you deprioritized hobbies, leisure activities, and exercise because of your work?"). Cronbach's alpha for this scale was satisfactory (α = .78). 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 (e.g., "The conditions of my work are excellent"). l. This modified scale indicated good internal consistency (α = .87). Respondents indicated their level of agreement using a seven-point Likert-scale ranging from 1 (strongly disagree) to 7 (strongly agree).

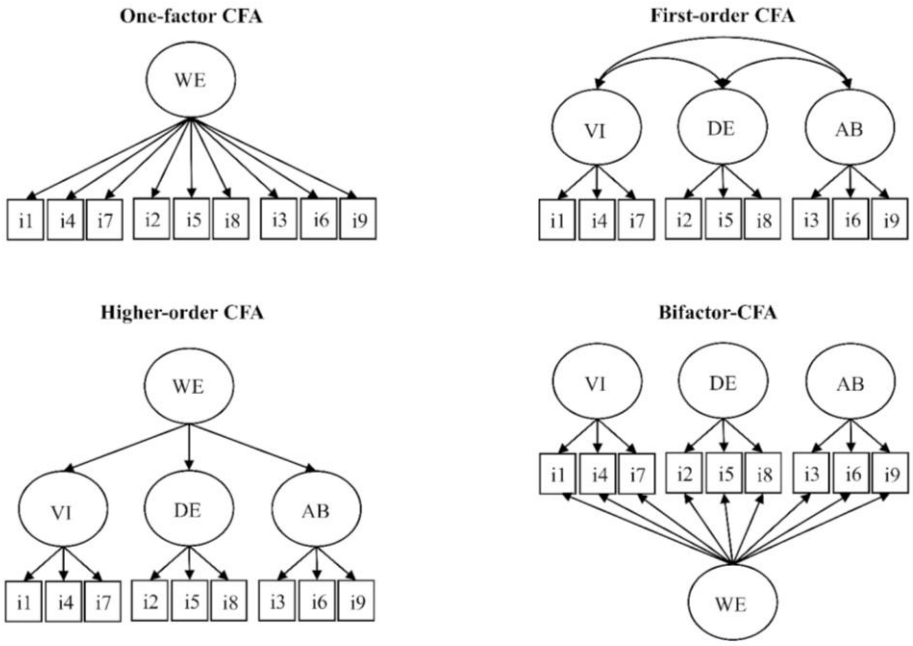
V/2.3. Statistical Analyses

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 (see Figure 1 for a graphical depiction of these models): (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 three-factor CFA solution, items were set to load only on their a priori specific factors, cross-loadings were set to be zero, and factors were allowed to correlate with one another. In the second-order model, specifications were the same as in the first-order model, but the correlations between the factors were replaced by a second-order global work engagement factor. In bifactor-CFA solution, items were set to load on their respective S-factors as well as on the work engagement G-factor, and following typical bifactor specifications (Reise, 2012) factors were specified as orthogonal (i.e., not allowed to correlate with one another). 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): configural

invariance (i.e., factor structure), weak invariance (i.e., factor structure and factor loadings), strong invariance (i.e., factor structure, factor loadings and intercepts), strict invariance (factor structure, factor loadings, intercepts, and uniquenesses), latent variance-covariance invariance (factor structure, factor loadings, intercepts, uniquenesses, factor variances and factor covariances), and latent mean invariance (factor structure, factor loadings, intercepts, uniquenesses, factor variances, factor covariances, and latent means).

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): the Comparative Fit Index (CFI; ≥.95 good, ≥.90 acceptable), the Tucker–Lewis Index (TLI; ≥.95 good, ≥.90 acceptable), the Root-Mean-Square Error of Approximation (RMSEA; ≤.06 good, ≤.08 acceptable) with its 90% confidence interval. It has to be noted the RMSEA has been shown to tends to be overinflated under conditions of low degrees of freedom (Kenny et al., 2015); therefore, this indicator is reported for the sake of transparency and comparability with previous studies, but less emphasis will be put on its interpretation. 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). All questions were mandatory; therefore, the sample sizes were the same for all analyses. The data can be found on the following link: https://osf.io/upn9c/?view_only=8fd4125ad1654e32b7219ba29aaa0ecf



V/Figure 1. Schematic Representation of the Estimated Model for Work Engagement.

Note. CFA = confirmatory factor analysis; i1-i9 = item 1-9; VI = vigor; DE = dedication; AB = absorption; WE = work engagement. Unidirectional arrows represent factor loadings, bidirectional arrows represent correlations.

V/3. RESULTS

V/3.1. Structural Analysis and Measurement Invariance

Goodness-of-fit statistics of the UWES-9 can be seen in Table 1. The one-factor solution (S1M1 and S2M1) had poor fit in both samples. The three-factor CFA model (S1M2 S2M2) 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 (S1M3 and S2M3) was identical to that of the first-order

model. However, fit for the bifactor models (S1M4 and S2M4) 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.

V/Table 1. Goodness-of-Fit Statistics of the Alternative Measurement Models on the Hungarian Version of Utrecht Work Engagement Scale

Model	χ^2 (df)	CFI	TLI	RMSEA	Comparison	$\Delta\chi^2$ (df)	ΔCFI	ΔTLI	ΔRMSEA	RDR
Sample 1										
S1M1. One-factor CFA	215.595* (27)	.866	.822	.170 [.149, .191]	—	—	—	—	—	—
S1M2. Three-factor CFA	102.366* (24)	.944	.917	.116 [.094, .140]	S1M1	74.048 (3)*	+.078	+.095	-.054	Na
S1M3. Second-order CFA	102.370* (24)	.944	.917	.116 [.094, .140]	S1M1	74.048 (3)*	+.078	+.095	-.054	Na
S1M4. Bifactor CFA	46.016* (18)	.980	.960	.080 [.052, .109]	S1M2	59.795 (6)*	+.036	+.043	-.036	Na
Sample 2										
S2M1. One-factor CFA	242.039* (27)	.905	.873	.126 [.111, .140]	—	—	—	—	—	—
S2M2. Three-factor CFA	101.819* (24)	.966	.948	.080 [.064, .096]	S2M1	111.372 (3)*	+.061	+.075	-.046	Na
S2M3. Second-order CFA	102.537* (24)	.965	.948	.080 [.065, .097]	S2M1	132.544 (3)*	+.060	+.075	-.046	Na
S2M4. Bifactor CFA	53.315* (18)	.984	.969	.062 [.043, .082]	S2M2	48.279 (6)*	+.018	+.021	-.018	Na
Measurement Invariance Across Gender										
MG1. Configural invariance	84.162* (36)	.987	.974	.060 [.043, .077]	—	—	—	—	—	—
MG2. Weak invariance	105.197* (50)	.985	.978	.054 [.040, .069]	MG1	20.511 (14)	-.002	+.004	-.006	.025
MG3. Strong invariance	111.108* (55)	.985	.980	.052 [.038, .066]	MG2	4.151 (5)	.000	+.002	-.002	NPC
MG4. Strict invariance	117.824* (64)	.985	.983	.047 [.034, .061]	MG3	8.382 (9)	.000	+.003	-.005	NPC
MG5. Latent variance-covariance invarian	124.139* (68)	.985	.984	.047 [.034, .060]	MG4	6.337 (4)	.000	+.001	.000	.028
MG6. Latent means invariance	131.724* (72)	.984	.984	.047 [.034, .060]	MG5	7.675 (4)	-.001	.000	.000	.035
Measurement Invariance Across Age										
MA1. Configural invariance	91.675* (36)	.985	.969	.064 [.048, .081]	—	—	—	—	—	—
MA2. Weak invariance	110.681* (50)	.983	.976	.057 [.043, .071]	MA1	16.046 (14)	-.002	+.007	-.007	.014
MA3. Strong invariance	132.854* (55)	.978	.972	.062 [.048, .075]	MA2	27.379 (5)*	-.005	-.004	+.005	.077
MA4. Strict invariance	155.031* (64)	.975	.972	.062 [.049, .074]	MA3	22.213 (9)*	-.003	.000	.000	.044
MA5. Latent variance-covariance invarian	185.608* (68)	.967	.965	.068 [.056, .080]	MA4	22.446 (4)*	-.008	-.007	+.006	.079
MA6. Latent means invariance	206.883* (72)	.963	.963	.071 [.060, .082]	MA5	24.914 (4)*	-.004	-.002	+.003	.084
Measurement Invariance Across Organizational Levels										
MO1. Configural invariance[a]	116.603* (56)	.984	.969	.066 [.049, .083]	—	—	—	—	—	—
MO2. Weak invariance[b]	144.931* (82)	.983	.978	.056 [.040, .070]	MO1	26.965 (26)	-.001	+.009	-.010	.007
MO3. Strong invariance	158.536* (92)	.982	.979	.054 [.039, .068]	MO2	12.085 (10)	-.001	+.001	-.002	.017
MO4. Strict invariance	184.654* (110)	.980	.980	.052 [.039, .065]	MO3	26.692 (18)	-.002	+.001	-.002	.025
MO5. Latent variance-covariance invarian	232.741* (118)	.969	.972	.062 [.051, .074]	MO4	43.116 (8)*	-.011	-.008	+.010	.077
MO6. Latent means invariance	269.562* (126)	.961	.967	.068 [.056, .079]	MO5	40.437 (8)*	-.008	-.005	+.006	.074

Model	χ^2 (df)	CFI	TLI	RMSEA	Comparisor	$\Delta\chi^2$ (df)	ΔCFI	ΔTLI	ΔRMSEA	RDR
Measurement Invariance Across Samples										
MS1. Configural invariance	154.568* (36)	.968	.937	.094 [.079, .109]	—	—	—	—	—	—
MS2. Weak invariance	102.508* (50)	.986	.980	.053 [.038, .068]	MS1	52.533 (14)*	+.018	+.043	-.041	.061
MS3. Strong invariance	107.961* (55)	.986	.981	.051 [.036, .065]	MS2	3.305 (5)	+.000	+.001	-.002	NPC
MS4. Strict invariance	119.706* (64)	.985	.983	.048 [.035, .062]	MS3	12.246 (9)	-.001	+.002	-.003	.022
MS5. Latent variance-covariance invarianc	129.531* (68)	.984	.983	.049 [.036, .062]	MS4	9.566 (4)	-.001	.000	+.001	.043
MS6. Latent means invariance	138.784* (72)	.982	.982	.050 [.037, .062]	MS5	9.496 (4)	-.002	-.001	+.001	.028

Note. *$p < 0.01$; CFA = confirmatory factor analysis; χ^2 = Chi-square; df = degrees of freedom; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root-mean-square error of approximation; 90% CI = 90% confidence interval of the RMSEA; $\Delta\chi^2$ = Robust (Satorra-Bentler) chi-square difference test (calculated from loglikelihood for greater precision); ΔCFI = change in CFI value compared to the preceding model; ΔTLI = change in the TLI value compared to the preceding model; ΔRMSEA = change in the RMSEA value compared to the pre-ceding model; RDR: root deterioration per restriction index; Na = not applicable; NPC: not possible to calculate due to the fact that the chi-square difference value is smaller than the difference in the degrees of freedom; [a] The residual variance of item 3 was constrained to be higher than zero in all groups to achieve identification; [b] The residual variance of item 3 and the variance of the dedication S-factor were constrained to be higher than zero in group 2 and 3, respectively, to achieve identification.

In the next step, measurement invariance was tested across the two samples (Models MS in Table 1) to verify the replicability of the final bifactor-CFA model (see Table 1). 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 (Models MG in Table 1), age (Models MA in Table 1), and organizational level (Models MO in Table 1), 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 (derived from Model MS6) are reported in Table 2. These results 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/Table 2. Standardized Parameter Estimates from the Latent Mean Invariant Bifactor-CFA solution for the Hungarian version of Utrecht Work Engagement Scale (Model MS6).

	ENG (λ)	VIG (λ)	DED (λ)	ABS (λ)	δ
Vigor					
Item 1	.745**	.576**			.114
Item 2	.761**	.465**			.205
Item 5	.748**	.144**			.419
ω		.655			
Dedication					
Item 3	.905**		.067*		.176
Item 4	.884**		.465**		.002
Item 7	.793**		.046		.369
ω			.379		
Absorption					
Item 6	.769**			.156**	.384
Item 8	.712**			.554**	.186
Item 9	.824**			.319**	.219
ω	.961			.573	

Notes. CFA = Confirmatory factor analysis; λ = Factor loading; δ = Item uniqueness; ω = model-based omega composite reliability; *$p < .05$; **$p < .01$.

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 (see Appendix 2 in the online supplements for more information).

Correlations between factors of work engagement, factors of need fulfillment and turnover intention can be seen in Table 3. 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 (see Table 4), 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. DISCUSSION

The aim of our study was to examine the representation of work engagement (as measured by the UWES-9) and to test whether the bifactor structure of work engagement would be a more adequate and improved representation compared to alternative first-order and the second-order solutions. This approach allowed us to bridge seemingly diverging perspectives by simultaneously considering both the global and specific components of work engagement. As an additional aim, the present study also documented the validity evidence of this representation based on its test-criterion relationship with basic psychological need fulfillment at work, turnover intentions, work addiction, and work satisfaction.

V/Table 3. Spearman Bivariate correlations between the variables used in Sample 1 (N = 242).

	1	2	3	4	5	6	7	8	9	10	11
1. Work engagement G-factor	—										
2. Vigor S-factor	0	—									
3. Dedication S-factor	0	0	—								
4. Absorption S-factor	0	0	0	—							
5. Need fulfillment G-factor	.561**	.178**	.052	.095	—						
6. Autonomy satisfaction S-factor	.440**	-.044	.158*	.107	.154*	—					
7. Relatedness satisfaction S-factor	.170**	.037	.065	-.086	.067	.014	—				
8. Competence satisfaction S-factor	-.049	.085	-.006	.061	.118	-.085	-.042	—			
9. Autonomy frustration S-factor.	-.249**	-.114	.020	.031	-.103	-.009	.095	.127*	—		
10. Relatedness frustration S-factor	.125	.013	-.008	.160*	.048	.128*	.032	.008	-.028	—	
11. Competence frustration S-factor	-.091	.030	-.009	-.067	-.068	-.024	.056	-.009	-.031	-.010	—
12. Turnover intention	-.646**	-.095	-.150*	.051	-.569**	-.415**	-.219**	.281**	.210**	.035	.038

Notes. G-factor = global factor from the bifactor model; S-factor = specific factor from the bifactor model; **$p < .01$, *$p < .05$.

V/Table 4. Spearman Bivariate correlations between variables used in Sample 2 (N = 505).

	1	2	3	4	5
1. Work engagement G-factor	—				
2. Vigor S-factor	0	—			
3. Dedication S-factor	0	0	—		
4. Absorption S-factor	0	0	0	—	
5. Work addiction	.134**	-.045	.071	.198**	—
6. Work satisfaction	.713**	.038	.131**	.055	-.035

Notes. G-factor = global factor from the bifactor model; S-factor = specific factor from the bifactor model; **$p < .01$, *$p < .05$.

V/4.1. The Bifactor Representation of Work Engagement

Our results, in line with Hypothesis 1, supported the superiority of the bifactor representation of work engagement, thus also aligning with findings reported by de Bruin and Henn (2013) as well as Gillet et al. (2018, 2019). 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. These specific dimensions also reflect the extent to which vigor, dedication and absorption deviate from the global levels of engagement. Previous studies using the UWES suggested that researchers should focus on using either the global or the specific components. However, our study shows that the two approaches are not mutually exclusive. Indeed, our study illustrates why it is important to carefully compare alternative measurement models in terms of model fit and standardized parameter estimates. The first-order CFA results demonstrated similar patterns to previous studies (e.g., Kulikowski, 2019; Littman-Ovadia & Balducci, 2013; Wefald et al., 2012; Zeijen et al., 2018) in that model fit was less than optimal across the two samples. Correlations between the three first-order factors were high, suggesting the potential presence of an unmodelled G-factor. By contrast, the fit indices for the bifactor solutions, which does incorporate a work engagement G-factor, were good in both samples.

Inspection of the parameter estimates associated with the bifactor model revealed a well-defined work engagement global factor, with a meaningful amount of specificity being retained in the vigor and absorption S-factors, and a smaller amount of specificity in the dedication S-factor. The weaker representation of the specific factors in the bifactor solutions can be attributed to scale items being associated with a specific and a global factor simultaneously. The small amount of specificity of the items of the dedication factor suggests that these items mostly reflected participants' global sense of work engagement. However, this particular result does not mean that the bifactor model is not optimal or that the dedication S-factor should be discarded. Indeed, as stated by Morin et al. (2016), it is rare to observe that all S-factors are well-defined in bifactor solutions which typically include at least some well-defined S-factors apart from a strongly defined G-factor. A weaker S-factor shows that a subset of items only serves to reflect global levels of work engagement, and this

weaker S-factor simply should be interpreted with caution. While it has been argued that partial bifactor solutions should be pursued in the case of weaker S-factors (de Bruin & Henn, 2013; Fong & Ho, 2015), we argue that the meaningfulness of the G- and S-factors should be tested in relation to theoretically-relevant correlates before removing any S-factors as these investigation might support the added value of the S-factors over and above the G-factor.

V/4.2. Test-Criterion Relationship Based Validity of the Bifactor Representation

Global Levels of Work Engagement. Our 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. More specifically, global levels of work engagement demonstrated a positive association with global levels of need fulfillment (e.g., Trépanier et al., 2015), providing support for Hypothesis 2a. These results suggest that experiencing high global levels of work engagement tend to be positively associated with experiencing high global levels of need fulfillment at work. When employees' basic psychological needs are fulfilled at their workplace, they are more likely to experience growth, wellness, and optimal functioning (Ryan & Deci, 2017) which can translate into functioning more effectively at work and experiencing higher levels of positive work-related states such as work engagement. Both cross-sectional (e.g., (Trépanier et al., 2013) and longitudinal (e.g., Trépanier et al., 2015) studies have reported need fulfillment to be an important predictor of work engagement. Over and above the global levels of need fulfillment, global work engagement was also associated with high specific levels of autonomy satisfaction and relatedness satisfaction. Experiencing high levels of engagement at work thus might not only be related to global levels of need fulfillment, but also specific levels of autonomy and relatedness satisfaction, suggesting that engaged employees tend to experience high levels of autonomy and relatedness satisfaction over and above the global levels of work engagement.

In addition to these findings, global levels of work engagement were negatively related to specific levels of autonomy frustration and turnover intentions which is in line with previous empirical studies (e.g., Shuck et al., 2015; Trépanier et al., 2013; Wang et al., 2018)

that relied on first-order representations of work engagement. These results highlight that the frustrated need for autonomy (i.e., feelings of pressure and conflict at work) might have a negative effect on employees' work engagement. Such need frustrated experiences might be attributed to need thwarting work conditions (Vansteenkiste & Ryan, 2013) in which employees are expected to behave in a certain way and have less control over what and how they need to do in their work, thus they cannot act in a volitional manner. Prior studies have already provided support for this explanation (e.g., Deci et al., 2001; Van den Berghe et al., 2016; see Deci et al., 2017 for an overview). Finally, the negative association between global levels of work engagement and turnover intentions is consistent with Hypothesis 2d, and is also in line with results of prior studies (e.g., Lovakov et al., 2017; Mills et al., 2012; Wefald et al., 2012). Thus, when employees do not feel engaged in their work, they might be more likely to detach themselves from the organization and potentially leave it.

Global levels of work engagement showed a positive and weak association with work addiction which is in line with Hypothesis 2b. This result is consistent with the results reported in most previous studies (e.g., Clark et al., 2014; Di Stefano & Gaudiino, 2018; Littman-Ovadia et al., 2014; van Beek et al., 2012). Even though this association was positive, its magnitude remained small which further supports the idea that global levels of work engagement and work addiction reflect two distinct construct that are relatively independent from one another. Additionally, global work engagement also showed a positive association with work satisfaction (i.e., engaged employees were more likely to be satisfied with their work), thus providing empirical support for Hypothesis 2c and further establishing the validity evidence of this representation. This result also corroborates findings reported in cross-sectional (e.g., (Klassen et al., 2012; Littman-Ovadia & Balducci, 2013; Schaufeli et al., 2019) and meta-analytic (Christian et al., 2011) studies. While these constructs share conceptual similarities (i.e., the value of pleasure at work), they differ from one another in two main characteristics. First, they differ in their level of activation: work engagement is characterized by high level of energy as opposed to the low energy level in work satisfaction (Bakker & Oerlemans, 2011). Second, they have different sources of origin: work engagement is an affective outcome of work experience, while work satisfaction is an attitude towards work, which is based on the evaluation of conditions and characteristics of work (Christian et al., 2011; Salanova et al., 2014; Schaufeli et al., 2019).

Specific Levels of Work Engagement. Finally, our results also answered our Research Question by showing that some of the specific components of work engagement appeared to have an added value by demonstrating meaningful associations with the correlates. First, specific levels of *vigor* were positively related to global levels of need fulfillment at work. This result suggests that employees experiencing fulfilled basic psychological needs at work might have more work-related energy and mental resilience beyond the global levels of work engagement. Second, specific levels of *dedication* were positively related to specific levels of autonomy satisfaction and work satisfaction, but negatively to turnover intentions. These relationships suggest that by perceiving work as significant, inspiring, and meaningful (over and above the global levels of work engagement) might stem from having ample amount of choice and self-initiation at work, and it could also be protective of negative outcomes (i.e., lower levels of turnover intentions) and conductive of positive outcomes (i.e., higher levels of work satisfaction). Third, specific levels of *absorption* were positively related to specific levels of relatedness frustration. That is, when employees experience social rejection and exclusion at work by coworkers or supervisors, they might be more likely to become immersed in and obsessed with their work. This finding is consistent with prior studies (e.g., Tóth-Király, Bőthe, Orosz, et al., 2019) documenting the potentially negative effects associated with relatedness frustration. This result is less surprising when we take into account that being isolated and lonely have already been related to decreased wellbeing and other maladaptive outcomes (e.g., Kim et al., 2009; Mellor et al., 2008). Becoming over-engaged with work (i.e., having high specific levels of absorption) might become a compensatory behavior for employees in order to counter the experiences of need frustration (Bőthe et al., 2020; Tóth-Király, Bőthe, Márki, et al., 2019; Vansteenkiste & Ryan, 2013). Specific levels of absorption, similar to prior findings relying on first-order factors (Clark et al., 2016; Di Stefano & Gaudiino, 2018; Líbano et al., 2012; Shimazu et al., 2015), were also positively related to work addiction. This positive relationship highlights the shared nature of absorption and work addiction as both are characterized with an immersion into the work-related activities from which it is difficult to disengage.

Overall, the present two-study investigation shows that work engagement might be best represented by a bifactor solution incorporating an overarching work engagement construct underlying all responses, as well as the three components of vigor, dedication, and

absorption. Failure to taking into account this representation might lead to erroneous conclusions due to the high associations (i.e., multicollinearity) between the three work engagement components that appear to reflect a more global construct, while also masking the potential complementary effect of the S-factors beyond the G-factor. For these reasons, we would advise researchers to, in their pursuits, consider relying on fully latent measurement models that do not only make it possible to estimate the most optimal bifactor representation of work engagement, but they are also naturally corrected for measurement error. When the sample size is modest, similar to our approach, researchers could rely on factor scores derived from the bifactor measurement model in order to preserve its underlying nature (Morin, Boudrias, et al., 2016). In practical terms, this approach allows researchers to obtain a more precise and direct estimate of global work engagement as bifactor models weight items based on their contribution to the factor itself. To make this process seamless, as suggested by Perreira et al. (2018), automated scoring procedures could be developed, or the Mplus statistical package could be used, which has the advantage of providing standardized measurements interpretable as a function of the sample mean and standard deviation.

V/4.3. Strengths and Limitations

The current study provides an alternative solution to the debate about the appropriate representation of work engagement. While the bifactor-CFA solution was the most optimal in comparison to other alternative models, it also allows us to investigate the nature of work engagement both on the global and the specific level. An additional strength is the replication of our findings using an independent second sample. The current study also documented the validity evidence of bifactor-CFA representation of work engagement based on its test-criterion relationship which was an important step toward its better understanding.

Nevertheless, there are some limitations that should be considered. Both studies were cross-sectional, implying that causality cannot be inferred from our results. Given that self-reported measures were used, responses might have been biased (e.g., social desirability). Future longitudinal research would be necessary to give a deeper understanding of how the representation of work engagement changes over time. Alternatively, it would be important to complement the present results with longitudinal or intervention studies with enhanced

methodological quality (Chacón-Moscoso et al., 2016). The generalization of the current results requires their replication on a larger, international sample. Moreover, the sample consisted of mostly female and white-collar/manager participants; therefore, the sample is not representative of the Hungarian population. Future studies should verify the findings on a representative and more diverse sample (e.g., a sample including health care professionals and respondents from other occupations). Further studies focusing on examining the bifactor-CFA representation should be conducted in other countries and languages as well. Future studies would also do well in re-assessing the validity evidence based on test-criterion relationship using different work-related measures. It would also be interesting to examine the representation of engagement towards other activities such as studies (Dierendonck et al., 2021) or job (Gillet et al., 2020). Given that the dedication S-factor had relatively low reliability, future studies should investigate whether this is a re-occurring phenomenon or whether it is a sample-specific result.

V/5. CONCLUSION

Taken together, the present research demonstrated the superiority of the bifactor solution, which not only provides 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. The importance of the specific factors of work engagement were illustrated by their diverse relations with these correlates. The results supported the discriminant validity evidence of vigor, dedication, and absorption as specific factors. The current findings support the simultaneous application of the global work engagement construct and its specific components.

VI. THE POSITIVE GAIN SPIRAL OF JOB RESOURCES, WORK ENGAGEMENT, OPPORTUNITY, AND MOTIVATION ON TRAINING TRANSFER (STUDY 4)[10]

ABSTRACT

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 investigated the relationship between job resources/demands and training transfer through work engagement, transfer motivation, and opportunity to transfer. Based on data from 311 working adults who participated in soft skill training programs, job resources were associated with higher levels of training transfer through increased work engagement, motivation, and opportunity to transfer. In contrast, job demands had negative relationships with transfer via work engagement and opportunity to transfer. The findings supported the assumption of the positive gain spiral in the transfer context. We conclude that companies should prioritize the development of job resources to provide a better environment for training transfer.

Keywords: job demands, job resources, motivation to transfer, opportunity to transfer, training transfer, work engagement

[10] 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

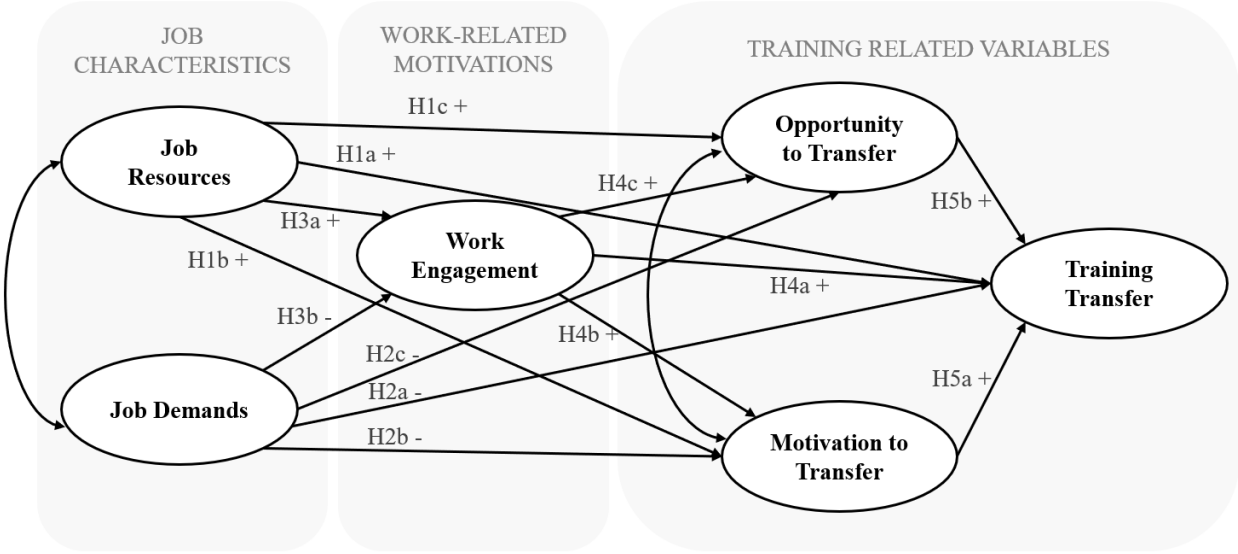
VI/1. INTRODUCTION

Organizations expect their workforce training and development to lead to a return on investment (Aguinis & Kraiger, 2009). Thus, they want their employees to improve their productivity by using the skills and knowledge that they learn during these trainings. However, this return on investment can be reduced by the lack of training transfer (i.e., the on-the-job application of knowledge and skills acquired in a training program; Baldwin & Ford, 1988; Burke & Hutchins, 2007; Ford et al., 2018; Kauffeld & Massenberg, 2018). Training transfer is influenced by numerous factors that should be considered to ensure transfer success.

Training transfer scholars have identified and synthesized several individual, environmental, and training design factors which are necessary for successful transfer (e.g., Bell et al., 2017; Blume et al., 2010; Botke et al., 2018; Ford et al., 2018). Motivation to transfer (e.g., Burke & Hutchins, 2007; Gegenfurtner et al., 2009) and opportunity to transfer the learned skills on the job (e.g., Burke & Hutchins, 2007; Ford et al., 2018) have proven to be among the most essential predictors of training transfer. Organizations that want to ensure transfer success need to understand how to boost the presence of these essential drivers of transfer. Although motivation to transfer received ample research interest (e.g., Bates et al., 2007, 2012; Gegenfurtner et al., 2009; Gegenfurtner & Quesada-Pallarès, 2022; Massenberg et al., 2017), the investigation of how opportunity to transfer can be fostered in the organizational environment was relatively neglected and only a few studies considered it (e.g., Ford et al., 1992; Quiñones et al., 1995; Nijman, 2004). Consequently, the current study aims to investigate whether and how these essential factors in the transfer process can be influenced by individual and environmental conditions. This would support our understanding of how participants' transfer motivation and opportunity seeking/perceptions could be improved.

Evidence suggests that certain environmental factors have positive relationships with transfer (e.g., supervisor and peer support; Burke & Hutchins, 2007; Hughes et al., 2020), but we know less about the underlying mechanisms for how general environmental characteristics like job demands and resources relate to the transfer process, including with transfer motivation, opportunity to transfer, and training transfer. For this purpose, the present study seeks to add to this body of research by primarily relying on two comprehensive

theoretical frameworks. First, we apply the Job Demands-Resources Model (Bakker & Demerouti, 2007, 2017) to identify the effects that job demands and resources have on the transfer process. Second, as job demands and resources are known to be related to employees' work engagement (Schaufeli & Taris, 2014), we build on the mechanism of resource gain cycles (Hobfoll, 2011) in the Conservation of Resources Theory (Hobfoll, 1989). We consider how work engagement that may function as an engine for effective transfer might mediate the effects of job demands and resources to improve training-related outcomes. Below we will outline the hypotheses of the current study based on the proposed model in Figure 1.



VI/Figure 1. Proposed research model of the relationship between job resources, job demands, work engagement and the transfer process

VI/1.1. Job Demands and Job Resources

The Job Demands-Resources Model (Bakker & Demerouti, 2007, 2017) distinguishes two general types of job characteristics that are associated with two different processes and may be related to employees' training transfer. Job resources (e.g., constructive feedback, autonomy support) are those aspects of work that are essential to managing job demands and the associated psychological costs, as well as to achieving personal growth, learning, and development at work (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004). According to

the Job Demands-Resources Model (Bakker & Demerouti, 2007, 2017), job resources have a motivational potential at work. First, they generate intrinsic motivation as stimulating employees' personal growth, learning, and development which leads to basic psychological needs fulfillment. Second, they have an extrinsic, instrumental motivation role as they provide necessary resources to increase employee willingness to dedicate effort to complete their work tasks and goals (Bakker & Demerouti, 2008).

Concerning the associations between job resources and training transfer, several important forms of job resources have been identified that are relevant to training and development. These forms include social support from colleagues and supervisors, high-quality relationships, transformational leadership, autonomy, job control, participation in decision making, performance feedback, opportunities for learning and growth, financial rewards, and career opportunities (e.g., Bakker & Demerouti, 2007, 2008; Christian et al., 2011; Fernet et al., 2015; Hakanen et al., 2006; Schaufeli et al., 2009). Among these resources, the positive effect of social support on training transfer has received the most supporting evidence, with studies showing that higher levels of social support have been associated with higher levels of training transfer (e.g., Blume et al., 2010; Burke & Hutchins, 2007; Richter & Kauffeld, 2020). Other forms of job resources were also found as important predictors. For example, higher levels of autonomy at work (Axtell et al., 1997) and more frequent performance feedback (Van den Bossche et al., 2010; Velada et al., 2007) have both been associated with better training transfer.

Beyond these specific examples of job resources, according to the assumptions of the Job Demands-Resources Model (Bakker & Demerouti, 2007, 2017), the general perception of a resource-rich environment may also be beneficial. While previous research has identified the positive impact of some specific job resources, their relative importance may vary across organizations, occupations, individuals (e.g., Bakker & Demerouti, 2014), and even training topics due to the large number of potentially relevant job resources. Investigating them at a general level in the training transfer context allows us to test whether training participants' general perception of their job resources can contribute to their motivation and transfer. Based on prior findings regarding the positive influence of specific job resources, and the assumption that job resources are essential to achieving personal growth, learning, and

development at work (Bakker & Demerouti, 2007; Schaufeli & Bakker, 2004), we expect that employees with ample general job resources will report better transfer outcomes.

While job resources may be directly related to training transfer itself, it is also likely that the general job resources are related to the other two components of the transfer process. Through job resources' motivational potential (Bakker & Demerouti, 2007, 2017) that fosters learning and development they may be directly associated with transfer motivation, and through their instrumental potential (Bakker & Demerouti, 2007, 2017) they may also be positively related to opportunity to transfer. Based on these assumptions, it is likely that those who see their job environment as resource-rich (e.g., have autonomy, a supportive supervisor, receive feedback, etc.) are more motivated to practice and apply the techniques learned during the training program. In a similar vein, employees who perceive ample amounts of resources at work might also perceive more opportunities to transfer the learned skills to the job. Based on the above theoretical reasoning and empirical findings, the following hypotheses are formulated regarding the relationship between general job resources and the transfer process:

Hypothesis 1. *Job resources are positively related to (1a) the transfer of training, (1b) motivation to transfer, and (1c) opportunity to transfer.*

Job demands (e.g., work pressure, emotionally demanding interactions) refer to the physical, psychological, social, or organizational aspects of the job that require employees' sustained physical and/or psychological effort and are likely to take a physical and psychological toll on employees (Demerouti et al., 2001). Job demands have been identified as triggers of a health-impairment process and are unique predictors of harmful outcomes such as exhaustion, disengagement, and burnout (Bakker et al., 2003; Demerouti et al., 2001). Indeed, studies have shown that persistent exposure to job demands tends to predict higher levels of sick leave, poor health, depressive symptoms, and undesirable organizational outcomes (Bakker & Demerouti, 2007; Bakker et al., 2014; Hakanen, Schaufeli, et al., 2008).

Based on the general negative consequences of job demands, it can be expected that a higher presence of job demands in a work environment will be related to a less successful training transfer process. For example, when training participants experience a very high workload or a high pressure of deadlines that occupies their focus and drains their energy, it

is likely that they will not transfer what they learned during training. Just as job demands and demanding job environments can drain employees' energy and motivation (Schaufeli & Bakker, 2004), they might also decrease employees' motivation to transfer the learned skills and decrease their intention to grow. In a demanding environment (e.g., with a high workload and time pressure to complete everyday tasks) that leaves little-to-no space for personal growth, employees may recognize fewer opportunities to apply their learned skills. It is also likely that these environmental demands prevent employees from implementing or practicing their new skills. While situational constraints have not received considerable attention in transfer literature (Blume et al., 2010), a few studies suggest that workplace constraints (e.g., workload pressures, lack of time) may be associated with lower levels of transfer motivation, opportunity to transfer, and training transfer (e.g., Blume et al., 2010; Clarke, 2002; Facteau et al., 1995; Mathieu et al., 1992; Peters & O'Connor, 1980). Nevertheless, similar to job resources, the relative importance of job demands may also vary across organizations, occupations, and individuals (e.g., Bakker & Demerouti, 2014). Consequently, in studies that do not focus exclusively on the training of participants from one occupation and from one organization, it is worthwhile to investigate their role in the transfer process more generally. Based on these assumptions and research findings, the following hypotheses are formulated:

Hypothesis 2. *Job demands are negatively related to (2a) the transfer of training, (2b) motivation to transfer, and (2c) opportunity to transfer.*

VI/1.2. Work Engagement

Job-related variables (e.g., job involvement, job satisfaction, organizational commitment) have been included in models relating to training motivation and transfer and found to be positively related to them (e.g., Colquitt et al., 2000; Cheng & Hampson, 2008; Zumrah & Boyle, 2015). When placing job-related variables into the broader theoretical context of the Job Demands-Resources model (Bakker & Demerouti, 2007, 2017), it is worthwhile to consider work engagement, a less studied work-related construct in the transfer literature. Work engagement has been found to be positively associated with numerous beneficial individual and work-related variables like psychological health (Gillet et al., 2019; Simbula et al., 2013), personal development (Simbula et al., 2013), and work performance (Alessandri et al., 2015; Gorgievski et al., 2010). Work engagement can be described as a

work-related positive state of mind that is characterized by vigor (i.e., high levels of mental resilience and energy), dedication (i.e., work is perceived as meaningful and inspiring), and absorption (e.g., employees are deeply immersed in their work) (Schaufeli et al., 2002). This construct is related to job attitudes (e.g., job involvement and organizational commitment), but it refers to "the extent to which individuals invest their "full selves" in the execution of their work" rather than the extent to which employees identify themselves with their job or value their organizations (Christian et al., 2011, p. 120). Although they are all related and share some conceptual space, they reflect different aspects of work attachment and are empirically different constructs (Christian et al., 2011). Based on the motivational and energetic aspects of work engagement, and its integration in the theoretical context of the Job Demands-Resources model (Bakker & Demerouti, 2007, 2017), the investigation of its role in the training transfer context appears promising.

The Job Demands-Resources Model provides insights into how job demands and resources at work might be related to employees' attitudes toward their work, more specifically their work engagement. According to the model, job resources trigger a motivational process that increases work engagement and better work performance (Bakker & Demerouti, 2007). Several previous studies provided evidence for the proposed positive effect of job resources on work engagement. Specifically, Schaufeli and Bakker (2004) reported direct positive associations between specific job resources (e.g., social support, performance feedback) and work engagement in different samples of Dutch employees. These findings were replicated in a large sample of Finnish teachers (Hakanen et al., 2006), and also on a Spanish sample (Llorens et al., 2006). In their quantitative review, Christian et al. (2011) reported positive associations between work engagement and a variety of job resources (e.g., transformational leadership, high-quality relationship with supervisor, social support from colleagues, autonomy, feedback, task significance, and task variety).

In contrast, job demands can drain employees' energy and motivation according to Schaufeli and Bakker (2004). While job resources are generally reported as the most important predictors of work engagement, a meta-analytic study (Halbesleben, 2010) provided evidence for a weaker, negative relationship between job demands and work engagement. The findings of this meta-analysis are in line with empirical studies (e.g., Mauno et al., 2007; Trépanier et al., 2014) which reported negative associations between work

engagement and job demands. Based on these widely supported relationships between job resources, job demands and work engagement, the current study aims to replicate these findings:

Hypothesis 3a. *Job resources are positively related to work engagement.*

Hypothesis 3b. *Job demands are negatively related to work engagement.*

VI/1.3. Work Engagement in the Transfer Process

To maximize the success of the transfer process, organizations want their employees to be engaged for multiple reasons. For example, work engagement has been associated with employees' proactive behavior (i.e., employees' aim to improve their work methods and procedures; Sonnentag, 2003). Initiating and accomplishing any proactive behavior at work (such as putting more emphasis on applying the skills acquired during training) requires an extra effort from employees which can be underpinned by their vigorous work engagement (e.g., Frese et al., 1997). According to Sonnentag (2003), employees are more likely to invest the necessary extra effort into taking initiative if they are dedicated to their work and if they concentrate on their work and are absorbed into it. Although other job-related variables like job satisfaction and organizational commitment have been found to be positively related to training transfer (e.g., Colquitt et al., 2000; Cheng & Hampson, 2008), the investigation of the relationship between work engagement and training transfer has been relatively neglected. Nevertheless, the few studies that have examined these relationships have found that work engagement is positively related to training transfer (e.g., Nazli & Khairudin, 2018).

It is also likely that beyond the assumed direct relationship between work engagement and training transfer, work engagement can also foster the other two factors in the transfer process. As previous research shows, people with high levels of work engagement tend to take more personal initiatives at work (Hakanen, Perhoniemi, et al., 2008; Sonnentag, 2003). Parker and colleagues (Parker et al., 2010; Parker & Griffin, 2011) also found that work engagement stimulates different proactive behaviors while broadening employees' cognitive processes. In addition, Bakker and Demerouti (2008) argued that the positive effect of work engagement on employees' effective goal-directed behavior is due to their high energy and motivation level that they utilize in achieving their goals. In a similar vein, it is likely that by

energizing and freeing employees' cognitive processes up, work engagement may also have a positive relationship with transfer motivation.

Moreover, according to the proposition of the Job Demands-Resources theory (Bakker & Demerouti, 2007, 2017), it is likely that employees who are engaged in their work, may be more proactive, and initiate to change their own work environment. Wrzesniewski and Dutton (2001) called this proactive behavior job crafting, which was defined by Tims et al. (2012) as the self-initiated changes employees make in their job demands and resources to achieve their goals. In the training transfer context, it is likely that employees who experience higher levels of work engagement not only have more sensitivity to recognize opportunities at work (Cropanzano & Wright, 2001), but also take the initiative to create their own opportunities to transfer learned skills to the job. According to these assumptions, engaged employees can be expected to notice more opportunities at their work. Based on this reasoning, the following hypotheses were formulated:

Hypothesis 4. *Work engagement is positively related to (4a) the transfer of training, (4b) motivation to transfer, and (4c) opportunity to transfer.*

VI/1.4. Motivation to Transfer and Opportunity to Transfer

This study seeks to examine the associations between employees' demanding and resource-rich work environment, their work engagement, and the process of training transfer. As the proposed model (Figure 1) contains the elements and relationships of the transfer process, our final hypotheses are based on the findings of several previous studies that support the positive relationship between transfer motivation, opportunity to transfer, and training transfer (e.g., Burke & Hutchins, 2007; Ford et al., 2018; Gegenfurtner et al., 2009).

Huang et al. (2017) suggested that it is likely that the relationship between transfer motivation and opportunity to transfer is reciprocal, and these factors can mutually influence each other. Similarly, Gegenfurtner et al. (2009) assumed that these factors can be independently present in the transfer process, and the presence of transfer motivation may influence the occurrence of opportunity to transfer by stimulating trainees to actively seek or create it. Following these assumptions, as motivation to transfer and opportunity to transfer may influence one another and can be independently and simultaneously present, we placed these correlated factors at the same stage in the proposed model. It allowed us to separately

investigate their relationships with the other factors involved in the model while also modeling their mutual relationship. The present study aims to directly replicate previous findings that found direct positive relationships between motivation to transfer (e.g., Massenberg et al., 2015; Reinhold et al., 2018), opportunity to transfer (e.g., Burke & Hutchins, 2007; Ford et al., 2018) and training transfer:

Hypothesis 5a. *Motivation to transfer is positively related to training transfer.*

Hypothesis 5b. *Opportunity to transfer is positively related to training transfer.*

VI/1.5. Mediators between Job Resources/Demands and Training Transfer

Beyond the replication of the direct positive relationships between transfer motivation, opportunity to transfer and training transfer, the current study also aims to investigate their mediating role in the transfer process. Previous studies have proposed that work environmental characteristics (e.g., social support) may not directly influence training transfer, but rather function as environmental triggers that have an indirect relationship through increased motivation (Baldwin & Ford, 1988; Gegenfurtner et al., 2009). These assumptions were supported by several prior studies. For example, motivation to transfer was found to partially mediate the relationship between feedback and training transfer (van den Bossche et al., 2010), and the relationship between peer support and training transfer (Richter & Kauffeld, 2020; Salamon, Blume, Orosz & Nagy, 2022). Other studies found that the transfer motivation fully mediates the relationship between peer support and transfer (Bhatti et al., 2013; Massenberg et al., 2015; Reinhold et al., 2018).

Although the mediator role of opportunity to transfer has received less research attention, it can also be seen as an important mediator in the transfer process. For example, Nijman (2004) found that instrumental supervisor support (i.e., direct, practical support that provides necessary resources) increases opportunity to transfer. Govaerts and Dochy (2014) also identified providing opportunities to use the learned skill to the job as an important form of supervisor support. Based on this finding, it can be assumed that the resource-rich (supportive) environment may also have an indirect relationship with training transfer through ensuring the necessary opportunity to transfer learned skills to the job.

Furthermore, according to the proposition of the Job Demands-Resources model (Bakker & Demerouti, 2017) job resources stimulate a positive gain spiral by increasing work

engagement. This positively influences motivation and energizes job crafting behavior that leads to proactively creating new resources. This is also in line with the propositions of the resource caravan passageways principle of the conservation of resources theory (Hobfoll et al., 2018). According to this theory, the gain spiral is influenced by the general organizational resources (like safety and organizational support), which can protect pre-existing resources and foster further resource generation (Hobfoll, 2011; Hobfoll et al., 2018). For example, employees in a resource-rich work environment tend to be more engaged to their work (e.g., Schaufeli & Bakker, 2004), and this engagement energizes them to proactively change their own work environment and create new resources (Bakker & Demerouti, 2007, 2017) needed for reaching their goals (e.g., the opportunity to transfer learned skills). In contrast, the relationship between job demands and work engagement can cause a resource loss spiral (Hobfoll, 2018) in which employees experiencing high job demands at work (e.g., workload pressures, lack of time) may experience less motivation, recognize fewer opportunities to transfer, and have lower learning and transfer capacity. Consequently, it can be assumed that work engagement mediates the relationship between job demands and resources and the variables of the transfer process. Therefore, we investigate the following additional mediation hypotheses:

Hypothesis 6. *(6a) Work engagement, (6b) opportunity to transfer and (6c) motivation to transfer each independently mediate the relationship between job resources and training transfer.*

Hypothesis 7. *(7a) Work engagement, (7b) opportunity to transfer, and (7c) motivation to transfer each independently mediate the relationship between job demands and training transfer.*

In addition to these independent, direct mediation effects, we also expect serial mediation from a combination of these paths. Based on the positive gain spiral and the resource-loss spiral assumptions of the conservation of resources theory (Hobfoll et al., 2018), we expected a systematic relationship pattern between the above-mentioned mediators leading to two serial mediation patterns or chains demonstrated in the last two hypotheses:

Hypothesis 8. *Job resources show a positive, serial indirect relationship with training transfer through the (8a) work engagement and opportunity transfer path, and through the (8b) work engagement and motivation to transfer path.*

Hypothesis 9. *Job demands show a negative serial indirect relationship with training transfer through the (9a) work engagement and opportunity transfer path, and through the (9b) work engagement and motivation to transfer path.*

VI/2. METHOD

VI/2.1. Procedure and Participants

The study was conducted in accordance with the Declaration of Helsinki, approved by the Institutional Review Board of the Eötvös Loránd University Faculty of Education and Psychology, and is in line with the EU General Data Protection Regulation (2016). Data collection was conducted in eight mid- to large-size Hungarian companies. These companies included those who have business operations in Hungary with human resource managers who were interested in participating in the study, had soft skill training programs in the previous months, and where the legal department did not restrict the incentivization of survey respondents. The invitation letter to participate in the study was sent to employees who had attended a training program in the prior six months. Voluntary participation was encouraged by a lottery drawing that awarded a total of 50 small prizes, each worth about $15.

There were several steps conducted to maximize the respondent's ability and motivation to respond accurately. These steps are consistent with suggestions of procedural remedies that can decrease some aspects of common method variance (e.g., Podsakoff et al., 2012; Reio, 2010). The survey was pretested with three participants of different training programs to ensure all instructions and items were easily understandable. Accurate responses were encouraged in the recruitment email and the survey's instructions by emphasizing the importance of participants' opinions, thoughts, and experiences. Respondents were informed that there are no right or wrong answers, and asked to give their honest opinion and experience. Anonymity was also ensured. Respondents were told that company-specific reports (containing company-specific, but summarized data to make identification of respondents impossible) would be provided to their employers to support them in improving the usefulness and transfer of future training programs.

The final sample included those who participated in a company-organized, soft-skill development training program (e.g., stress management, time management, leadership

development) with at least one classroom session and who responded to the survey between 13-120 days after training. With the chosen timeframe, participants had at least two weeks after the classroom session to transfer the training to their job, and less than four months after training to ensure that the training was recent enough to accurately recall relevant aspects of the transfer process. In the online survey, respondents were instructed to consider the last training program in which they participated.

The final sample consisted of 311 working adults (48% female) who were between 22 and 64 years old (M_{age} = 39.2, SD_{age} = 9.3). Regarding their organizational levels, 167 (53.7%) worked at a non-managerial level whereas 144 (46.3%) worked at a managerial level. The eight participating companies (workforce ranged between 500-15,000 employees) operate in the accounting, automotive, chemical, energy, financial, insurance, pharmaceutical, and retail sectors. A study has been published based on the same database (Salamon, Blume et al., 2021). However, this study focuses on distinct research questions and includes different predictor and mediator variables.

VI/2.2. Measures

Data collection was conducted in Hungarian. To support the potential application of the shared materials in future research, the original materials were translated into English, following a standardized translation-back translation protocol proposed by Beaton, Bombardier, Guillemin and Ferraz (2000). The full questionnaire and related materials are available on the project's OSF page: https://osf.io/dua3f/.

Job demands and resources (predictor). We used a 10-item scale (Demerouti et al., 2001) to measure respondents' perceived job demands (five items; e.g. "I never have enough time to perform my tasks."; α = .56) and resources (five items; e.g. "I can decide myself how to perform my work."; α = .77). All items were rated on a five-point Likert-scale (1 = not true at all, 5 = very true for it).

Work Engagement (mediator). The Hungarian version of the short version of the Utrecht Work Engagement Scale (UWES-9, Schaufeli et al., 2006) was used to measure global levels of work engagement (α = .93) through its three underlying dimensions: vigor (three items; e.g. "At my work, I feel bursting with energy"), dedication (three items; e.g. "I am enthusiastic about my job"), and absorption (three items; e.g. "I get carried away when

I'm working"). Responses were provided on a seven-point Likert-scale (1 = never, 7 = always).

Opportunity to Transfer (mediator). 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. The items were formulated based on Ford et al.'s (1992, p. 512) definition of opportunity to perform (i.e., "the extent to which trainee is provided with or actively obtains work experiences relevant to the tasks for which he or she was trained"). One item referred to the opportunities provided by the workplace ("My workplace provided me with tasks allowing me to practice what I had learned at the training.") and two items referred to the opportunities that participants proactively sought (e.g., "At work, I was actively seeking problems I could solve by using my new knowledge."). All items were scored on a seven-point Likert-scale (1 = Not true at all, 7 = Completely true). This scale had good reliability ($\alpha = .79$).

Motivation to Transfer (mediator). A three-item scale (Salamon, Blume et al., 2021) was used to measure participants' transfer motivation to use the new techniques after the training (e.g., "By the end of the training, I was determined to use the new techniques I learned at the training."). Salamon, Blume et al. (2021) originally built this scale on previous works (e.g., Nijman & Gelissen, 2011; Noe & Schmitt, 1986; Warr et al., 1999). All items were rated on a seven-point Likert-scale (1 = not true at all, 7 = completely true). Scale reliability was good ($\alpha = .91$).

Training Transfer (outcome). To assess the application of learned techniques on the job, a four-item scale of Salamon, Blume et al. (2021) was used. This scale was based on the work of Tesluk et al. (1995) and the items were changed to reflect on a topic-independent, general behavior transferred to the job (e.g., "At my workplace, I applied the methods acquired during training."; $\alpha = .95$). Responses were provided on a seven-point Likert-scale (1 = Not true at all, 7 = Completely true).

Time Lag (control). In line with the suggestion of Taylor, Russ-Eft and Taylor (2009), Salamon, Blume et al. (2021) found that participants reported less motivation to transfer when more time had passed after training. Consequently, we controlled for this time lag by measuring the number of days between the end of the last training session and the response date on the survey.

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. In this preliminary model, scale items loaded on their corresponding latent factors, and the factors were freely allowed to correlate with one another. 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 (see Figure 1) 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 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.

Two additional analyses were conducted to assess potential biases in the dataset. First, we performed Harman's single factor test (Podsakoff et al., 2003) to assess the extent to which common method bias may be a problem. Second, as the survey respondents were recruited from eight different companies, we conducted fixed-effects modeling to control for the company-level effects and test the robustness of the SEM estimates (McNeish & Stapleton, 2016). In the fixed-effects model, the companies were represented with dummy coded variables (k-1 = 7) and added to the regression model as covariates. In this model, the significance of the studied coefficients did not change, and their magnitude changed only slightly. However, the model fit indices substantially decreased, and the model does not fit

the data well. Consequently, we included the results of the proposed model without controlling for companies in the present paper. The goodness-of-fit indices for the estimated models (Table S1) and the standardized and unstandardized regression weights of the fixed-effect model (Table S2) are included in the online supplements.

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) the Comparative Fit Index (CFI; ≥ .95 for excellent, ≥ .90 for good), the Tucker–Lewis Index (TLI; ≥ .95 for excellent, ≥.90 for good), and the Root-Mean-Square Error of Approximation (RMSEA; ≤ .06 for excellent, ≤ .08 for good) with its 90% confidence interval. In the preliminary measurement model, the definition of the factors was interpreted based on the magnitude of their factor loadings (Morin et al., 2020). Finally, we calculated model-based composite reliability indices (ω; McDonald, 1970) which may better represent the construct, relative to Cronbach's alpha, by estimating reliability from the factor loadings and their respective measurement errors. Within R 4.0.3 (R Core Team, 2020), the tidyverse package (version 1.3.0.; Wickham et al., 2019) was used for data transformation, the sem function of the lavaan package (version 0.6-7; Rosseel, 2012) was used for the structural equation modeling analyses, and for calculating the omega composite reliability indices. The data and analysis code can be found on the project's OSF page: https://osf.io/dua3f/.

VI/3. RESULTS

VI/3.1. Preliminary Analyses

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]). Parameter estimates (reported in Table S3) revealed well-defined and reliable factors for job resources (λ = .410 to .759, ω = .773), job demands (λ = .338 to .506, ω = .567), work engagement (λ = .607 to .875, ω = .928), motivation to transfer (λ = .660 to .875, ω = .805), opportunity to transfer (λ = .823 to .909, ω = .911), and training transfer (λ = .887 to .953, ω = .956). Bivariate correlations from this preliminary measurement model are reported in Table 1.

The results of the Harman's single factor test showed that the single factor model did not fit the data well (χ^2 = 2825.415, df = 377, CFI = .466, TLI = .425, RMSEA = .145 [90%

CI .140, .149]). Therefore, according to this test the results of our study do not appear to be especially influenced by common method bias.

VI/Table 1. Descriptive statistics and bivariate correlations between variables

	M	SD	1	2	3	4	5	6
1. Time Lag	47.25	27.24	–					
2. Job Resources	3.55	.64	.175**	–				
3. Job Demands	2.14	.59	–.077	–.240*	–			
4. Work Engagement	5.38	.84	.112	.508**	–.307**	–		
5. Motivation to Transfer	4.21	1.39	–.074	.285**	–.186*	.241**	–	
6. Opportunity to Transfer	5.09	1.35	–.036	.322**	–.028	.302**	.778**	–
7. Training Transfer	4.95	1.34	–.035	.265**	–.136	.214**	.761**	.791**

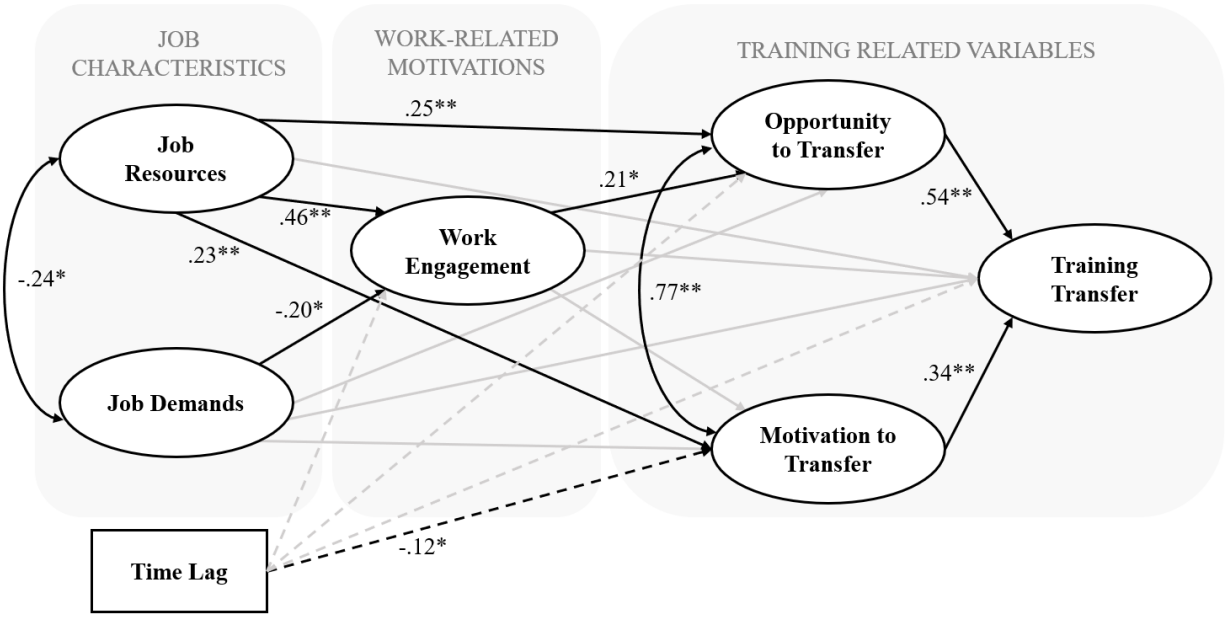
Notes. N = 311, M = Mean, SD = standard deviation, Time Lag: Days elapsed between training and data collection. All variables represent latent factors except for the measured variable of Time Lag.
*p < .05; **p < .01.

VI/3.2. Main analyses

The results of the proposed model are also shown on Figure 2. 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 2. 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. DISCUSSION

The present study investigated the effect of job resources and job demands on training transfer through work engagement and transfer motivation and opportunity. Contrary to expectations, the results show that job resources, job demands, and work engagement did not have a direct relationship with training transfer. However, job resources were found to be a key variable that was directly associated with both motivation to transfer and opportunity to transfer skills to the job, which were related to transfer. The results indicate that the relationship between job resources and training transfer is fully mediated by opportunity and motivation to transfer. These results are in line with some previous findings that suggest that environmental factors (e.g., social support) are mediated by transfer motivation (e.g., Bhatti et al., 2013; Massenberg et al., 2015; Reinhold et al., 2018) and opportunity to transfer (e.g., Nijman, 2004).

Furthermore, work engagement mediated the relationship between job resources and opportunity to transfer. These findings are in line 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). According to these principles, the existing resources of the work environment (e.g., support, autonomy, feedback) are positively related to employees' work engagement, which is also positively associated with their sensitivity to perceive and proactively create opportunities to transfer learned skills to the job. Moreover, the higher amount of perceived/created opportunities is associated with training transfer may further lead to increased personal and organizational resources.

While job resources seem to have a key role in connection with personal growth and development through work engagement and the important elements of the transfer process, it seems that job demands are less associated with these variables. In line with previous findings (e.g., Halbesleben, 2010; Mauno et al., 2007; Trépanier et al., 2014), job demands showed a negative relationship with work engagement, but contrary to the expectations they were 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 current findings show that job demands only have an indirect, negative effect on training transfer through the work engagement and opportunity to transfer chain.

Consistent with expectations, job resources were positively related to training transfer through the work engagement and the opportunity to transfer chain. The underlying mechanism of this effect could be through the increased ability of engaged training participants to mobilize their own personal resources to proactively create opportunities to transfer and request support in finding opportunities (Schaufeli et al., 2009; Xanthopoulou et al., 2009). Additionally, trainees higher in work engagement may have increased openness and sensitivity to recognize the opportunities present in the work environment (Cropanzano & Wright, 2001).

It was also assumed that work engagement would lead to increased motivation to transfer through increasing participants' motivation, energy, and interest. However, in contrast with the expectations, work engagement was not related to motivation to transfer. Based on these results, it seems to be more likely that training participants who are more engaged to their work create circumstances that are necessary for the application of the

learned skills, and their engagement level may not affect the transfer process through transfer motivation. These results increase the understanding of the job-related variables' effect on the transfer process and provide theoretical explanations of the underlying psychological mechanisms. Furthermore, the results of the present study support the findings of previous studies regarding the importance of opportunity and motivation to transfer in the transfer process (e.g., Burke & Hutchins, 2007; Ford et al., 2018; Gegenfurtner et al., 2009).

VI/4.1. Theoretical Implications

The current study provides a theoretical explanation of the relationship between general environmental characteristics, work engagement as a specific, job-related variable, and the training transfer process. The proposed model integrates job resources, job demands and work engagement, and examined their relationships within the transfer process by applying the Job Demands-Resources theory (Bakker & Demerouti, 2017) and the Conservation of Resources theory (Hobfoll, 1989). The results suggest that these theories can provide a conceptual basis for the working mechanism and antecedents of the transfer process. More specifically, the findings provide support for the positive gain spiral and partial support for the resource loss spiral (Bakker & Demerouti, 2017; Hobfoll, 2018) in the training transfer context. The positive gain spiral was represented by the positive indirect relationship between job resources and training transfer through the work engagement and opportunity to transfer chain. According to these, the positive gain spiral appears in the following way: employees in a resource-rich work environment tend to be more engaged to their work (e.g., Schaufeli & Bakker, 2004), have higher sensitivity to recognize (Cropanzano & Wright, 2001) and energy to proactively create new resources (i.e., opportunity to transfer; Bakker & Demerouti, 2017) that is needed for reaching their goals (i.e., transfer of training). In contrast, the resource loss spiral is represented in the current study by the negative indirect relationship between job demands and training transfer, again through the work engagement and opportunity to transfer chain. According to this indirect relationship, employees experiencing high job demands at work (e.g., workload pressures, lack of time) may be less engaged to their work and have less capacity to recognize/create necessary opportunities to transfer learned skill to the job, which is related to lower training transfer.

Furthermore, the current study was among the first studies to examine work engagement as a predictor variable in the training transfer context. General job resources seem especially useful for encouraging work engagement and increasing trainees' sensitivity to recognize and/or proactively seek opportunities to transfer. These findings are in line with both the Job Demands-Resources model (Bakker & Demerouti, 2017) and the Conservation of Resources theory (Hobfoll, 1989) and highlight the importance of environmental resources on personal development and growth. They also enable us to place the transfer process into the context of the broader work environment.

The findings of the current study support the important role of the work environment on the success of training transfer. Training participants' perceptions about their work environment, whether it is generally supportive and resource-rich, was positively related to training outcomes through their general work engagement and the opportunities they create/perceive to apply trained skills on the job. These results highlight the importance of employees' perceptions of resources and their work engagement in the transfer process, as well as provide some practical implications.

VI/4.2. Practical Implications

Based on the current findings, it is worth considering job resources that are available in the work environment, the extent of work engagement of employees and managers, and how these could be increased. General, not training-specific job resources appear to have a key role in the success of the transfer process by positively relating to work engagement, motivation to transfer and opportunity to transfer. Consequently, one area for practitioners who aim to increase training transfer could be enhancing the availability of necessary job resources.

Career opportunities and the opportunities for learning and growth (Bakker & Demerouti, 2007, 2008), like the opportunity to participate in a training program are already signs of a resource-rich work environment (Albrecht et al., 2015). Nevertheless, beyond making training programs available, there are further aspects of job resources that are also worth considering when the aim is to increase work engagement and training transfer. For example, the meta-analysis of Knight et al. (2017) provides a resource for this purpose, investigating the effect of four intervention types on work engagement. According to their meta-analytic findings, one way of increasing work engagement is to conduct health

promoting interventions (e.g., mindfulness intervention, freely available healthy food, exercise programs) that support employees creating healthier lifestyles and managing stress. Another option is building personal resources by improving individuals' optimism, resilience, and positive self-perceptions (i.e., self-efficacy). The improvement of leadership skills (e.g., giving feedback, providing support, coaching, managing stress) and building job resources in the work environment (e.g., increasing autonomy, feedback, or social support) can also increase employees' work engagement. Human resource professionals should also consider providing group interventions, as the meta-analytic findings of Knight et al. (2017) supported the superiority of those interventions.

Some specific job resources, like perceived autonomy, participation in decision making, and performance feedback not only proven to lead to higher levels of work engagement in previous studies (Bakker & Demerouti, 2007, 2008; Schaufeli et al., 2009) but are also identified as important predictors of training transfer (Van den Bossche et al., 2010; Velada et al., 2007). Similarly, social support is an important training transfer predictor (Blume et al., 2010; Burke & Hutchins, 2007), and general support from peers and supervisors is also identified as an important job resource that leads to higher work engagement (Bakker & Demerouti, 2007, 2008; Hakanen et al., 2006; Schaufeli et al., 2009). These specific examples of job resources can be the targets of interventions. More specifically, these findings suggest that human resource development professionals and managers should take actions to increase employees' perceived autonomy, create supportive organizational environment, and develop a "feedback-friendly" culture in which psychological safety is high, and employees proactively ask and provide feedback (Facteau et al., 1995; van der Rijt et al., 2012). For example, to increase the positive perceptions of participants about their supportive organizational environment, it is worth considering short and simple interventions like the short writing tasks that were tested by Kastenmüller et al. (2012). Besides that, job crafting interventions are also proven to be effective techniques in improving job resources, basic need satisfaction, and work engagement (van Wingerden et al., 2017).

Moreover, managers who allocate resources to train their team should consider whether trainees have enough dedicated time to practice and apply learned skills and support them to manage job demands (e.g., workload, bureaucracy, role ambiguity) to mitigate its

harmful effect on work engagement (Bakker & Demerouti, 2017), and reduce the negative, indirect effect on the transfer process. Beyond the above-mentioned specific examples of job resources and job demands, organizations could benefit from an assessment that identifies organization-specific intervention targets (i.e., creating or expanding specific job resources, or eliminating particular job demands) that can further improve employees' and managers' perception to see their environment as resource-rich and which can stimulate the positive gain spiral.

VI/4.3. Limitations and Future Research

While the current study has several strengths (e.g., data collection conducted in multiple companies operating in different sectors, multiple soft-skill training programs were included), there are also several limitations that should be considered in interpreting these findings. First, although the study provides valuable information about the role of the work environment in the transfer of soft skill training programs, further information is needed regarding the generalizability of these findings to hard skill development programs. Laker and Powell (2011) suggested several differences that could potentially influence the current findings in a hard skill development program. It can be assumed that there is a difference between hard and soft skill development programs regarding the difficulties and challenges participants may face. The opportunities to transfer the acquired soft skills may be less obvious than when transferring hard skills. For example, those who participated in a training that aims to improve the usage of a software package (hard skill) probably have access to that software and use it already in their tasks (i.e., the opportunity can be easily recognized). In contrast, for those who participated in an assertive communication (soft skill) training, finding the appropriate situations to utilize these skills can be more difficult (i.e., the opportunity may be less obvious or easy to recognize). Since participants of a soft skill training tend to have more autonomy to choose what and how to apply learned skills, principles, and techniques to the job, it can be assumed that the relationships examined in this study may be more important in soft skill training. Consequently, replication of the current study that investigates hard skill training programs would be important.

Second, this study employed a cross-sectional design that limits causal inference. Future studies using a different design could provide more accurate information about the

directionality of the relationships between job resources, job demands, work engagement, and the transfer process. According to the positive gain spiral (Hobfoll, 2018), the successful transfer process may also increase both perceived job resources and work engagement (c.f., Albrecht et al., 2015). An experience sampling design could provide further information about the effect of periodic fluctuations of work engagement on the transfer process (Sonnentag, 2003).

Third, the study was based on self-report data. On the one hand, self-report data collection is less problematic regarding variables that measure respondents' internal states – such as the predictor and mediator variables in this study – (e.g., Spector, 2019). On the other hand, future studies could provide more accurate information about training transfer by requesting that multiple sources (e.g., employee, peer, supervisor) provide information about the target behavior. If observable, researchers could also collect objective, business-related information (e.g., performance indicators).

Fourth, the potential effect of the nested data structure was considered and checked on the company-level, but there are other, unmeasured, and uncontrolled aspects of nesting (e.g., training groups, trainers, work groups) that could influence the investigated variables and their relationships. In accordance with the current findings, controlling for the work group level could be especially important to determine whether there could be different job demands and resources at that level. Furthermore, it is assumed by Bakker et al. (2011) that due to the emotional contagion effect (i.e., the transfer of moods among people in a group; Barsade, 2002) employees' work engagement can be also influenced by the work engagement of their colleagues. Future research could benefit from collecting more detailed information about the participants' training group, trainer, and work group since including these aspects could further improve the robustness of the findings.

Another promising direction for future research is to investigate the different types of job demands since the application of a general factor for measuring job demands in the current study may have contributed to this measure's low reliability. From a theoretical perspective, some researchers suggest that job demands have two main subcategories that have different effects on learning and performance (e.g., Bakker & Demerouti, 2017). One of these categories of job demands are called "job hindrances" which include job insecurity, role ambiguity, interpersonal conflicts, and constraints (e.g., Cavanaugh et al., 2000; Lepine

et al., 2005). It was found that job hindrances have a positive relationship with exhaustion and a negative relationship with vigor (Van den Broeck et al., 2010). In contrast, the other type of job demands (labeled as "job challenges") could have a similar stimulating function as job resources (e.g., Van den Broeck et al., 2010). Although specific job demands can be experienced both ways (challenge versus hindrance) depending on the context (Bakker & Demerouti, 2017), the differentiation between challenge and hindrance demands may improve the reliability of these scales and prove useful in future research. From a methodological perspective, the low level of Cronbach's alpha (i.e., scale score reliability) would have been more concerning had we relied on simple manifest scale scores (i.e., item sums or averages). Instead, throughout our main analyses, we relied on fully latent variables which are naturally corrected for measurement error and are thus perfectly reliable (Tóth-Király et al., 2018). We believe that our study highlights the importance of relying on such approaches when necessary.

Furthermore, in the present study opportunities to transfer training played a key role in the transfer process. A combined measure was used to assess whether opportunities to transfer were sought out by participants (active) or simply recognized by them (passive). Although this measure allowed us to investigate these combined mechanisms, developing adequate scales for separately measuring active versus passive opportunities and investigating their roles in the transfer process could provide further insights. The differentiation between these two types of opportunities could enable us to test their effect and role in the transfer process, which would support choosing the target of the intervention that would lead to more impactful training transfer.

VI/5. CONCLUSION

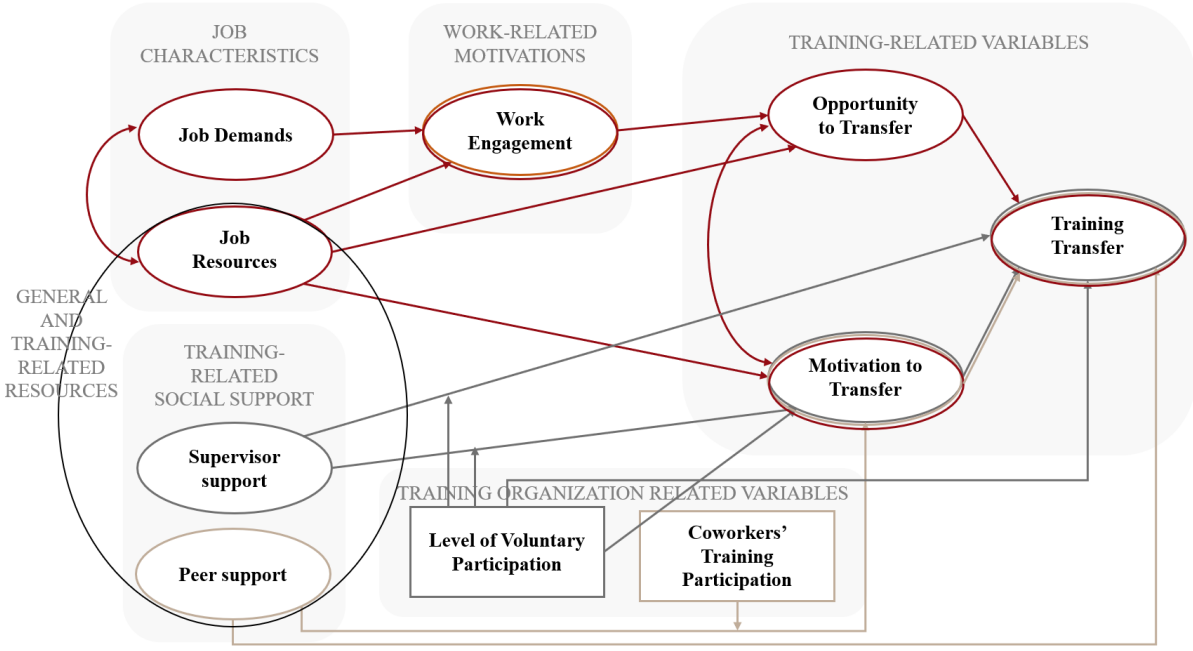
In line with the Job Demands-Resources theory (Bakker & Demerouti, 2017) and the Conservation of Resources theory (Hobfoll, 1989), the findings support the assumption of the positive gain spiral in the training transfer context. Training participants in an environment with ample resources experience stronger work engagement and can achieve transfer more successfully by perceiving and proactively creating more opportunities to transfer learned skills to the job. It is also important to mitigate job demands to avoid the resource loss spiral caused by its negative association with work engagement.

VII. GENERAL DISCUSSION

The present chapter provides a general summary and reflection on the main findings of the dissertation. It includes the main findings and the theoretical and practical implications of the four studies. It follows the general discussion of the limitations of the present studies. Finally, the proposed future research directions in training transfer research are discussed. The chapter is ended with the main conclusions of the findings.

VII/1. BRIEF SUMMARY

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. Figure 1 depicts the variables and their relationships investigated in the present dissertation for a general, visual overview.



VII/Figure 1. Overview of variables and relationships presented in the studies of the present dissertation.

Note. Different colored lines represent variables and relationships from different studies of the present dissertation: grey color represents Study 1, brown represents Study 2, orange represents Study 3, and red represents Study 4. One-headed arrows represent linear predictions. For clarity purposes, the control variables, and manifest variables (except for the manifest training organization related variables) are excluded from the figure.

In line with the above-mentioned 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.

As it is depicted in Figure 1, the studies in the present dissertation highlight the importance of both a general and a training-related work environment in soft skill trainings' transfer success. The findings of the studies imply that in a supportive work environment (especially where there is a shared understanding of and positive attitude towards the training content), participants' transfer motivation and their self-reported training transfer are higher. Although the training-related social support showed direct relationships with these variables (in *Study 1* and *Study 2*), the generally resource-rich work environment also showed indirect relationship with transfer through transfer motivation, and opportunity to transfer, and through the work engagement and opportunity to transfer chain (in *Study 4*). These findings are explained by 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), and the Social Cognitive Theory (Bandura, 1986). Furthermore, regarding the interplay between the

attendance policy and supervisor support, Self-Determination Theory (Deci & Ryan, 2000; Ryan & Deci, 2000, 2017) was utilized in *Study 1*.

VII/2. MAIN FINDINGS OF THE PRESENT STUDIES

The following section summarizes the main findings of the present studies. First, the findings of studies that investigated the interaction between contextual variables (i.e., level of voluntary participation, level of coworker training participation) and social support variables (i.e., supervisor support, peer support) are discussed (*Study 1-2*). Then the findings of the work engagement scale validation study (*Study 3*), and the findings of the proposed model that integrated job resources, job demands and work engagement, and their relationships with the transfer process are presented (*Study 4*).

VII/2.1. The Interplay between the Level of Voluntary Participation and Supervisor Support on Trainee Motivation and Transfer

Previous studies provided controversial findings on the important question whether mandatory or voluntary participation leads to better training outcomes. Building on the findings of a pilot interview study we argued in *Study 1* for the advantages of moving away from the dichotomous approach towards a more realistic one that can be used to measure the level of voluntary participation. Beyond the previous findings of training transfer studies (e.g., Baldwin et al., 1991; Blume et al., 2010; Curado et al., 2015; Lacerenza et al., 2017; Mathieu et al., 1992), the hypothesis regarding the positive effect of a more voluntary participation on training outcomes was based on the consequences of the self-determination theory (Deci & Ryan, 2012). However, some researchers assumed (e.g., Baldwin & Magjuka, 1991; Machin & Treloar, 2004; Salas et al., 2012; Tsai & Tai, 2003) that the more positive impact of mandatory training is at least partly due to the message it provides for trainees about the program's special importance for the organization. Consequently, beyond the single effect of the level of voluntary participation, the study also aimed to investigate its interaction with supervisor support (assuming supervisors' behavior can directly represent the organizational message about the training's importance).

The findings of *Study 1* show that the level of voluntary participation has a positive impact on transfer motivation and perceived training transfer. Furthermore, beyond the replication of previous findings about the importance of supervisor support on transfer outcomes (c.f., Blume et al., 2010; Burke & Hutchins, 2007; Hughes et al., 2020), the findings of the interaction effect underline that supervisor support is even more important when the participation is less voluntary. These findings are in line with the assumption that the provided signal about the importance of the training program has a positive impact (e.g., Baldwin & Magjuka, 1991; Machin & Treloar, 2004; Salas et al., 2012; Tsai & Tai, 2003). However, the present research warns that it can have an adverse effect if solely the participation is important (i.e., mandatory), but the transfer of training is not (e.g., when the supervisor do not show his or her support and interest about transfer).

VII/2.2. The Moderating Effect of Coworkers' Training Participation on the Influence of Peer Support in the Transfer Process

The positive effect of peer support on motivation to transfer and perceived training transfer was recognized by several reviews and meta-analytic studies (e.g., Blume et al., 2010; Burke & Hutchins, 2007; Ford et al., 2018; Hughes et al., 2020). Furthermore, in their recent meta-analytic review, Hughes et al. (2020) also provided evidence for the mediating role of motivation to transfer between peer support and transfer. However, the potentially moderating effect of coworkers' training participation that could be utilized for the endeavor of increasing transfer outcomes was relatively neglected. Consequently, in *Study 2* beyond the replication of previous findings regarding the direct and indirect effect of peer support on training transfer we also aimed to investigate the influence of the level of coworkers' training participation.

The findings demonstrated a replication of previous findings regarding the positive direct effect of peer support on motivation to transfer and training transfer, and the moderating effect of motivation to transfer between peer support and transfer. Furthermore, the findings of *Study 2* increased our understating about the effect of coworkers' training participation on the well-known relationships. The findings show that the coworkers' training participation has a moderating effect on the relationship between peer support and motivation to transfer. It also moderates the motivation to transfer mediated effect of peer support on

transfer, and not their direct association. These findings highlight the importance of the shared understanding and positive attitude of the direct social context on individual transfer motivation which is crucial for transfer success.

VII/2.3. Having the Cake and Eating It Too: First-Order, Second-Order and Bifactor Representations of Work Engagement

The aim of *Study 3* was to investigate the representation of work engagement (measured by the UWES-9; Schaufeli et al., 2006) in two distinct Hungarian samples of working adults, by systematically comparing its one-factor, first-order, higher-order, and bifactor confirmatory factor analytic (CFA) representations. In addition to that, we also tested the validity evidence of the most optimal representation to provide information whether the specific components have additional associations with other work-related correlates over and above their relationships with the global construct of work engagement.

The results demonstrated the superiority of the bifactor representations which was in line with the findings of de Bruin and Henn (2013), and Gillet et al. (2018, 2019). The bifactor representation also replicated well across samples, gender, age, and organizational level. In this representation, the direct reflection of employees' global level of work engagement is demonstrated, meanwhile the presence of specific factors (i.e., vigor, dedication, and absorption) are also proved over and above, and independently from, their global levels of engagement. Parameter estimates associated with the bifactor model demonstrated a well-defined work engagement global factor, a meaningful amount of specificity was represented by the vigor and absorption S-factors, and dedication S-factor showed a smaller amount of specificity. The weaker representations of the specific factors in the bifactor solutions can be attributed to the fact that the scale items are associated with a specific and a global factor simultaneously. The small amount of specificity of the items of the dedication factor suggests that these items mostly reflected participants' global sense of work engagement. However, their associations with meaningful theoretically-relevant correlates (i.e., basic psychological need fulfillment at work, turnover intentions, work addiction, and work satisfaction) provided evidence for their added value over and above the global level of work engagement.

VII/2.4. The Positive Gain Spiral of Job Resources, Work Engagement, Opportunity, and Motivation on Training Transfer

The aim of *Study 4* was to investigate whether situational factors like job resources and job demands can facilitate or undermine the success of transfer, and whether work engagement can play a mediating role in the effect of the situational factors on the transfer process. The findings demonstrate that job resources play a key role in transfer success. Although it does not have a direct effect on transfer, its effect on transfer is fully mediated by strong predictors like opportunity to transfer and motivation to transfer, and work engagement partially mediated the effect of job resources on opportunity to transfer.

These findings 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 principles imply that current resources in the work environment (e.g., autonomy, support, feedback) positively influence individuals' work engagement, which further increase their sensitivity to perceive and proactively create opportunities to transfer learned skills to the job. The increased amount of perceived and 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.

It was also expected that work engagement would influence motivation to transfer through increasing participants' interest. However, the findings indicated that the influence of work engagement is rather emerged in trainees' sensitivity to recognize or determination to create circumstances that are necessary for the application of the learned skills and not influencing their transfer motivation. The results of *Study 4* also support the findings of previous studies regarding the importance of opportunity and motivation to transfer in the transfer process (e.g., Burke & Hutchins, 2007; Ford et al., 2018; Gegenfurtner et al., 2009).

VII/3. IMPLICATIONS OF THE PRESENT DISSERTATION

VII/3.1. Theoretical Implications

The present dissertation aimed to address 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 research aims were in line with the suggestions of Ford et al. (2018). They encouraged researchers to address those questions that can support our understanding of whether and how the already known, essential transfer factors and their relationships can be influenced. 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 (e.g., Blume et al., 2019).

The findings of *Study 1* indicated that the more voluntary participation results in higher level of transfer motivation and training transfer, while the transfer outcomes of a less voluntary program can be similarly high if it occurs in a supportive environment. These findings provide a broader context of and an explanation for previous mixed results regarding the superiority of mandatory participation in some studies (e.g., Baldwin & Magjuka, 1991; Tsai & Tai, 2003) and the superiority of voluntary training participation in others (e.g., Baldwin et al., 1991; Mathieu et al., 1992). The findings integrated well into the self-determination theory (Deci & Ryan, 2000; Ryan & Deci, 2000, 2017), which suggests the more autonomous motivation leads to higher motivation to act and perform in comparison with the effect of a more controlled motivation (e.g., Gagné & Deci, 2005). Furthermore, the more desirable outcomes also can be facilitated in those circumstances when there is an extrinsically motivated activity (i.e., the external expectation of participation) by autonomy support that can lead to a more autonomous motivation through internalization and integration (Deci et al., 2017). Our findings also imply that although the impact of social support is stronger in more extrinsically regulated situations, its effect should not be neglected either in a more autonomously motivated situation. These findings indicate that it is necessary to consider individual motivation and environmental expectations for participation simultaneously.

Although the positive effect of peer support on motivation to transfer and training transfer was recognized by several reviews and meta-analytic studies (e.g., Blume et al., 2010; Burke & Hutchins, 2007; Ford et al., 2018; Hughes et al., 2020), the impact of providing a training intervention to the broader social environment simultaneously was relatively neglected. The findings of *Study 2* are in line with the Social Information Processing Theory (Salancik & Pfeffer, 1978), which underlines the importance of the social context in attitude formation and the manifestation of a behavior. Accordingly, when more coworkers participate in a training program, their shared understanding can increase the positive attitude toward the targeted knowledge, skills, and attitudes. Furthermore, it can also increase the chance of observing the targeted behavior on-the-job. According to the Social Cognitive Theory (Bandura, 1986), when a behavior is observable at the work environment it can increase learning and motivation to perform that behavior for others. Moreover, as the present research findings indicate, the level of coworker training participation can increase the influence of peer support on transfer motivation. 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.

In *Study 3* we 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 application of other representations can lead to flawed conclusions due to the high associations (i.e., multicollinearity) between the three work engagement components, which would imply the application of the global construct and mask the potential complementary effect of the specific factors beyond the global factor. However, the added value of the specific components above and over the global work engagement factor was also demonstrated by their meaningful associations with work-related correlates.

Although according to the findings of the previous study (*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 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.

To conclude, the studies in the present dissertation could increase our understanding of the interrelations of some well-known predictors of transfer. These applied an interactionist perspective to unfold the reasons of previously controversial findings and provided suggestions for considering some contextual aspects that can impact transfer outcomes but are still underutilized in practice. The applied interactionist perspective is in line with the approach of Blume et al. (2019). It also resonates well Ford et al. (2018), who emphasized the importance of investigating 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. The present studies 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. Furthermore, they also provided theoretical explanations for the underlying mechanisms that can increase crucial transfer predictors. The self-determination theory (Deci & Ryan, 2000; Ryan & Deci, 2000, 2017) provided a solid theoretical background of *Study 1* and increased our understanding regarding the motivational mechanisms that different attendance policies and autonomy-supportive social environment can create. The findings of *Study 2* regarding the importance of training the broad social environment on the effect of social support and transfer outcomes are supported by social information processing theory (Salancik & Pfeffer, 1978) and the social cognitive theory (Bandura, 1986). Finally, the findings of *Study 4* support the assumption of the positive gain spiral in the training transfer context, which are in line with the job demands and resources theory (Bakker & Demerouti, 2017), and the conservation of resources theory (Hobfoll, 1989).

VII/3.2. 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. Moreover, it would probably be beneficial if supervisors could participate in the same training program or receive a summary of the program's learning objectives and application options. Consequently, more resources would be available for them to support their colleagues to transfer training, and so they could apply some "other types of use" (i.e., evaluate, explain, instruct, and lead the transfer of training; Ford et al., 2019).

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. Although this could increase transfer success and is relatively easy to implement into practice, both literature (e.g., Kozlowski, 2018) and the study findings suggest that there is still a room for improvement in the application of this approach in practice. Nevertheless, the findings also indicate that coworkers' training participation is a double-edged sword, as the positive attitudes towards training can be advantageous, while their negative attitudes can have an adverse effect. Consequently, the positive attitude towards training programs, their relevance and their appropriate design are probably even more important in these programs. To offer and deliver effective training programs that are useful to trainees, practitioners can follow findings and suggestions in the HRD literature (beyond the overview at the beginning of the present dissertation, for more details see Ford, 2020; Kraiger & Ford, 2021). Furthermore, as the study findings indicate

the importance of peer support on transfer outcomes, it is suggested for organizations to consider developing a "feedback-friendly" culture and investing in training supervisors to foster a climate in which psychological safety is high, peers support training transfer, and employees proactively ask for high-quality feedback (Facteau et al., 1995; van der Rijt et al., 2012).

Study 3 investigated the factor structure of the Hungarian version of the short version of the Utrecht Work Engagement Scale (UWES-9, Schaufeli et al., 2006). The results showed that the measure have adequate validity evidence and reliability, which supports its application in future research. Furthermore, the study findings underlined the superiority of the bifactor structure of work engagement, which imply that the subfactors have added value beyond the global factor of work engagement. This finding suggests 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.

The findings of *Study 4* imply that organizations should create an environment that provides employees with the necessary resources allowing the maximization of their training transfer. Considering the important job resources in the training transfer context that affect work engagement, the most evident examples are career opportunities and the opportunities for learning and growth (Bakker & Demerouti, 2007, 2008), which imply that the opportunity to participate in a training program is already a sign of a resource-rich work environment (Albrecht et al., 2015). Moreover, as social support is found to be an important training transfer predictor both in *Study 1* and *Study 2* in this dissertation and in other previous studies (Blume et al., 2010; Burke & Hutchins, 2007), the general support from peers and supervisors is also identified as an important job resource that leads to higher work engagement (Bakker & Demerouti, 2007, 2008; Hakanen et al., 2006; Schaufeli et al., 2009). Perceived autonomy, participation in decision making, and performance feedback not only lead to higher levels of work engagement (Bakker & Demerouti, 2007, 2008; Schaufeli et al., 2009) but are also identified as important predictors of training transfer (Van den Bossche et al., 2010; Velada et al., 2007). On the other hand, organizations should manage job demands (e.g., workload,

bureaucracy, role ambiguity) to mitigate its harmful effect on work engagement (Bakker & Demerouti, 2017), and reduce the negative, indirect effect on the transfer process.

VII/4. LIMITATIONS AND FUTURE DIRECTIONS

VII/4.1. 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 (e.g., with carefully preselected programs and time lags between training and data collection), and the studies' design allowed us to test several important aspects of the training transfer field, it did not allow us to adequately assess whether learning happened at all. As these studies gathered information from multiple companies from multiple soft skill training programs, it was not feasible to integrate reliable knowledge, skill, and attitude tests for all training programs that could measure whether training objectives were accomplished (i.e., participants acquired the learned skills and were able to recall principles and techniques adequately). An open-ended question was integrated into the survey to measure whether

respondents could recall the main topics and techniques of the training program they participated. However, this qualitative knowledge acquisition measure was not mandatory to ensure a higher number of respondents and to keep their drop-out rate low. The non-mandatory and open-ended nature of the question resulted in only a few reliable responses that did not provide enough information to allow us to utilize them in the analyses. 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/4.2. 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 a 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 there are also important differences (e.g., in the person-

related, work-related, or situational cues) between different kind of soft skill development programs (e.g., programs targeting interpersonal skills like training assertive communication versus intrapersonal skills like the stress management skills). The training transfer related studies of the present dissertation recorded the specific topics of the training programs, which could be utilized for initial exploratory purposes. However, future research investigating these differences should apply more rigorous approach in recording important, specific details regarding the design of the programs (e.g., targeted specific knowledge, skills, and attitude; applied training design principles).

In line with the findings of previous research studies (e.g., Blume et al., 2010; Burke & Hutchins, 2007; Hughes et al., 2020), *Study 1* and *Study 2* in the present dissertation provided further evidence regarding the prominent role of social support in the training transfer process. These studies increased our understanding that beyond the general impact of different social support types, what are those situations where they have special influence on motivation to transfer and training transfer. However, as social support is a multidimensional construct (e.g., Baldwin & Ford, 1988; Lancaster & Di Milia 2015; Lancaster, Di Milia, & Cameron, 2013; Nijman & Gelissen, 2011), future intervention studies that aim to increase social support need more specific information about the behavior that the intervention targets. A promising start in this endeavor is related to the work of Govaerts and colleagues, who categorized 24 different supervisor support behaviors (Govaerts & Dochy, 2014), and identified 83 specific supportive actions, strategies, approaches, and attitudes (Govaerts et al., 2017). In future research, there is a need to narrow down this list and identify those specific supportive behaviors of peers and supervisors that have the greatest impact on training transfer. These studies should also consider whether the importance of these specific supportive behaviors is influenced by the training topics, or individual and environmental characteristics. Furthermore, to support interventions studies, it is also necessary to identify the barriers and enablers to conduct these identified specific supportive behaviors in the target population.

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 whether some specific factors have more influence in the transfer process than the others. Referring to the future directions discussed in *Study 4*, the investigation of specific work engagement factors could be especially important to explore in connection with the proactively sought versus passively perceived opportunity to transfer dimensions of the transfer process. The results of these studies could support our understanding about the underlying mechanisms between job-related factors and their effect on improving knowledge, skills and attitudes of employees and managers.

VII/5. 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.

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IX. APPENDICES

IX./1. APPENDIX OF STUDY 2: DETAILED ANALYTIC PLAN

IX./1. Statistical Analysis

Statistical analyses were performed with R 4.0.5 (R Core Team, 2020) using the robust maximum likelihood (MLR) 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. In this preliminary model, scale items loaded on their corresponding latent factors, and the factors were freely allowed to correlate with one another. Relying on fully latent variables also allowed us to reduce the biasing effect of item-level measurement error, in turn obtaining more accurate parameter estimates (Cheung et al., 2017; Cortina et al., 2021; Finkel, 1995).

For the main analyses, this measurement model was converted into the proposed predictive model (see Figure 1) in which peer support predicted training transfer directly and indirectly through motivation to transfer. In addition to that, in the proposed predictive model, 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, both training transfer and motivation to transfer were also predicted by time lag and organizational level. In the analysis, 1,000 bootstrap replication samples were used for estimating the 95% bias-corrected confidence intervals (CIs). These were computed with the maximum likelihood estimator as bootstrapping is not available with the robust maximum likelihood estimator. 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). This approach is a well-performing alternative to latent moderated structural equations (LMS - which are only available in M*plus*; Muthén and Muthén, 2012). PI is also robust to heteroskedasticity (Kolbe et al., 2020), obtains similar power but lower Type 1 error rates than LMS (Kolbe & Jorgensen, 2019), can be implemented into any software program, and provides more

traditional SEM fit indices that are not available when using LMS in M*plus* (Kolbe & Jorgensen, 2018). 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) the Comparative Fit Index (CFI; ≥ .95 for excellent, ≥ .90 for good), the Tucker–Lewis Index (TLI; ≥ .95 for excellent, ≥.90 for good), and the Root-Mean-Square Error of Approximation (RMSEA; ≤ .06 for excellent, ≤ .08 for good) with its 90% confidence interval. In the preliminary measurement model, the definition of the factors was interpreted based on the magnitude of their factor loadings. Following the recommendation of Morin et al. (2020) factor loadings greater than .500 were accepted as satisfactory. This simple rule is generally in line with the more detailed guidelines of Comrey and Lee (1992), who suggested to interpret factor loadings as excellent above 0.71, very good between 0.63 and 0.70, good between 0.55 and 0.62, fair between 0.44 and 0.33, and poor below 0.32.

Furthermore, we calculated model-based composite reliability indices (ω; McDonald, 1970; Morin et al., 2020) as $\omega = (\Sigma|\lambda i|)^2/([\Sigma|\lambda i|]^2 + \Sigma\delta ii)$ where λi represents the factor loadings and δii indicates the error variances. Its advantage is that it may better represent the construct, relative to Cronbach's alpha, by estimating reliability from the factor loadings (λi) and their respective measurement errors (δii). Its values above .60 are considered acceptable, and good above 0.70 (Bagozzi & Yi, 1988; Perreira et al., 2018). To establish convergent validity on the construct level we calculated average variance extracted (AVE) of the constructs, which is considered acceptable above the threshold of 0.50 (Hair et al., 2014). It was calculated as follows: $AVE = (\Sigma|\lambda i^2|)/N)$, where λi^2 indicates the squared factor loadings and N indicates the number of indicators. Moreover, to detect any potential problems regarding discriminant validity we used Heterotrait-monotrait (HTMT) ratio analysis, which indicates discriminant validity issues when HTMT ratios are higher than 0.90 (Henseler et al., 2015). Finally, we estimated the variance inflation factor (VIF) for the predictor, mediator, and moderator to detect potential issues of multicollinearity. The values of VIF indicate no multicollinearity below the threshold of 5 (Hair et al., 2018).

Within R 4.0.5 (R Core Team, 2020), the tidyverse package (version 1.3.0.; Wickham et al., 2019) was used for data transformation, the cfa function of the lavaan package (version 0.6-8; Rosseel, 2012) for calculating the omega composite reliability indices, the sem function of the lavaan package (version 0.6-8; Rosseel, 2012) and indProd function of the semTools package (version 0.5–4; Jorgensen et al., 2021) were used for conducting moderated mediation analysis. The data and analysis code can be found on the project's OSF page: https://osf.io/aw2kg/?view_only=a654da486f67403f8c35a88d1f3a432c.

IX./1. References

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IX./1. Table S1. Descriptive statistics by participating companies

Variables / Company codes	01	02	03	04	05	06	07	08	09	10	11	12	13	14	Total
N	149	14	75	101	49	7	59	3	29	57	21	34	54	36	688
Gender (Female)	23%	43%	52%	65%	73%	57%	58%	100%	48%	63%	67%	32%	57%	72%	52%
Mean Age (SD)	37 (8)	34 (8)	40 (9)	39 (9)	41 (7)	41 (7)	42 (10)	36 (13)	41 (7)	38 (8)	32 (7)	41 (9)	40 (10)	43 (11)	39 (9)
Role (Manager)	41%	21%	33%	43%	10%	86%	42%	33%	93%	39%	48%	71%	37%	36%	41%
Mean Time lag (SD)	57 (29)	42 (24)	46 (23)	72 (31)	46 (20)	72 (23)	44 (25)	25 (12)	60 (20)	59 (40)	50 (18)	31 (15)	32 (21)	35 (15)	52 (29)
Coworkers' Participation															
None	45%	29%	52%	43%	37%	14%	29%	0%	41%	19%	29%	38%	56%	47%	40%
Some	51%	50%	41%	50%	61%	86%	63%	100%	21%	68%	57%	62%	43%	47%	52%
Nearly All	4%	21%	7%	7.9%	2%	0%	9%	0%	38%	12%	14%	0%	2%	6%	8%
Mean Peer Support (SD)	3.1 (1.4)	3.7 (1.8)	3.0 (1.6)	3.4 (1.5)	2.8 (1.2)	3.7 (1.5)	4.6 (1.8)	4.1 (1.4)	4.1 (1.5)	3.3 (1.4)	3.8 (1.3)	3.1 (1.7)	2.9 (1.4)	3.0 (1.5)	3.3 (1.6)
Mean Mot. to Tran. (SD)	5.1 (1.3)	5.3 (1.7)	5.0 (1.5)	4.7 (1.6)	5.0 (0.9)	6.3 (0.6)	5.6 (1.6)	5.1 (1.0)	5.5 (1.2)	5.2 (1.2)	4.8 (1.4)	4.7 (1.3)	5.1 (1.1)	5.3 (1.3)	5.1 (1.4)
Mean Train. Transfer (SD)	4.9 (1.4)	5.1 (1.4)	4.8 (1.5)	4.9 (1.5)	5.1 (1.2)	6.1 (1.0)	5.4 (1.6)	5.9 (0.6)	5.3 (1.4)	4.9 (1.4)	5.1 (0.9)	4.8 (1.5)	5.1 (1.1)	5.0 (0.9)	5.0 (1.4)

Notes. The table shows the descriptive statistics (means of continuous variables, and frequencies of categorical variables) by companies. Time lag: Time lag between training & data collection (in days); Mot. to Tran.: Motivation to Transfer; Train. Transfer: Training Transfer.

IX./1. Table S2. Heterotrait-monotrait (HTMT) ratio of correlations

	PS	MTT	TT
Peer Support (PS)	–		
Motivation to Transfer (MTT)	.447	–	
Perceived Training Transfer (TT)	.487	.799	–

Notes. Entries larger than 1 suggest discriminant validity problems; entries lower than 0.90 indicate sufficient discriminant validity between associated constructs

IX./2. APPENDIX 1 OF STUDY 3: HUNGARIAN AND ORIGINAL ENGLISH VERSION OF THE SHORT VERSION OF UTRECHT WORK ENGAGEMENT SCALE (UWES-9)

	Hungarian Version	**English Version (Schaufeli et al., 2006)**
Instructions	Az alábbiakban 9 állítást fogsz olvasni a munkával kapcsolatos érzéseidről. Olvass el minden állítást figyelmesen és döntsd el, hogy tapasztaltad-e már az adott érzelmet a munkád során és ha igen, akkor milyen gyakran!	The following 9 statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. Indicate how often you felt it by crossing the number that best describes how frequently you feel that way.
Rating Scale	1 – Soha 2 – Szinte soha 3 – Ritkán 4 – Néha 5 – Gyakran 6 – Nagyon gyakran 7 – Mindig	1 – Never 2 – Almost never 3 – Rarely 4 – Sometimes 5 – Often 6 – Very Often 7 – Always
Item 1 (Vigor)	A munkahelyemen tele vagyok energiával.	At my work, I feel bursting with energy.
Item 2 (Vigor)	A munkámban erőteljesnek és élénknek érzem magam.	At my job, I feel strong and vigorous.
Item 3 (Dedication)	Lelkesedem a munkámért.	I am enthusiastic about my job.
Item 4 (Dedication)	A munkám inspirál.	My job inspires me.
Item 5 (Vigor)	Reggelente van kedvem dolgozni menni.	When I get up in the morning, I feel like going to work.
Item 6 (Absorption)	Boldog vagyok, amikor elmélyülten dolgozom.	I feel happy when I am working intensely.
Item 7 (Dedication)	Büszke vagyok a munkára, amit végzek.	I am proud of the work that I do.
Item 8 (Absorption)	Belemerülök a munkámba.	I am immersed in my work.
Item 9 (Absorption)	A munkám teljesen magával ragad.	I get carried away when I am working.

IX./3. APPENDIX 2 OF STUDY 3: PRELIMINARY MEASUREMENT MODELS

Preliminary analyses were carried out to examine the psychometric properties of the measures assessing the correlates, and to derive factor scores from these measurement models to examine the criterion validity of the most optimal representation of work engagement.

IX./3. Model Estimation

All analyses were conducted with Mplus 8 (Muthén & Muthén, 2017), and, similar to the main study, models were estimated with the robust maximum likelihood (MLR) estimator. The adequacy of the models was evaluated based on commonly-reported sample size-independent goodness-of-fit indices (Hu & Bentler, 1999; Marsh et al., 2005): the comparative fit index (CFI), the Tucker-Lewis Index (TLI), and the root mean square error of approximation (RMSEA). CFI and TLI were considered adequate or excellent when their values were higher than .90 and .95, respectively. Conversely RMSEA was considered acceptable and excellent when it had a value smaller than .08 and .06, respectively. McDonald's (1970) model-based composite reliability coefficient (ω) was also calculated as an indicator of reliability.

Sample 1. With respect to basic psychological need fulfillment, our decision to rely on the bifactor exploratory structural equation modeling (bifactor-ESEM; Morin, Arens, & Marsh, 2016; Morin, Arens, Tran, et al., 2016) framework is based on recent evidence showing that need fulfillment was best represented using this analytical framework, and that there is an added value of relying on ESEM (Myers et al., 2014; Tóth-Király, Bőthe, et al., 2018), bifactor (Brunet et al., 2016; Gillet et al., 2019), or bifactor-ESEM (Sánchez-Oliva et al., 2017; Tóth-Király et al., 2019; Tóth-Király, Morin, et al., 2018) components. In bifactor-ESEM, the ESEM component entails the free estimation of all cross-loadings between items and all factors (instead of forcing them to be zero). Recent statistical research has already shown that the free estimation of cross-loadings results in a more accurate depiction of the latent constructs even when very small (i.e., .100) cross-loadings are present in the population model, but, at the same time, the measurement model remains unbiased when no cross-loadings are present in the population model (for a review, see Asparouhov, Muthén, & Morin, 2015). The bifactor component allows the estimation of a global (G-) factor reflecting global levels of need fulfillment at work, while also taking into account the unique qualities

associated with each of the specific psychological needs that is not explained by the G-factor in the form of uncorrelated specific (S-) factors. As for turnover intention, it was operationalized as a unidimensional construct, thus modelled following the standard CFA specification where all items were specified to load on a single latent factor.

Sample 2. Work addiction and work satisfaction are thought to be relatively distinct construct and were thus measured with two separate scales. For this reason, they were estimated as a two-factor CFA model representing work addiction and work satisfaction with one a priori correlate uniqueness between the first two work addiction items.

IX./3. Results

Sample 1. The measurement model in Sample 1 demonstrated good fit (χ^2 = 279.155, df = 194; CFI = .966, TLI = .938, RMSEA = .043 [90% CI .031, .053]). Parameter estimates associated with this model are reported in Table S2. Examination of these estimates revealed a well-defined and reliable global need fulfillment factor (|λ| = .041 to .652, *M* = .513, ω = .933). As for the specific need fulfillment factors, relatedness satisfaction (|λ| = .319 to .704, *M* = .529, ω = .727) and autonomy frustration (|λ| = .229 to .673, *M* = .420, ω = .665) appeared to have retained a higher amount of specificity over and above the global factor. By contrast, autonomy satisfaction (|λ| = .383 to .545, *M* = .438, ω = .584), competence satisfaction (|λ| = .039 to .547, *M* = .392, ω = .570), and relatedness frustration (|λ| = .191 to .813, *M* = .378, ω = .561) retained a moderate amount of specificity, whereas competence frustration retained a lower amount of specificity (|λ| = .067 to .417, *M* = .183, ω = .225). Finally, turnover intention was also well-defined and highly reliable (|λ| = .820 to .956, *M* = .906, ω = .933).

Sample 2. Results pertaining to the preliminary measurement model were similar to Sample 1 in that the fit of the measurement model was adequate (χ^2 = 164.904, df = 42; CFI = .926, TLI = .904, RMSEA = .076 [90% CI .064, .089]). Both the work addiction (|λ| = .466 to .676, *M* = .571, ω = .745) and work satisfaction (|λ| = .608 to .903, *M* = .763, ω = .879) factors were well-defined and highly reliable. Factor scores were derived from these measurement models and used in the main study.

IX./3. References

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IX./3. Table S1. Prior validity and reliability characteristics of the 9 item Utrecht Work Engagement Scale

Authors	Nation	Sample	Analysis	Vigor (α)	Dedication (α)	Absorption (α)	χ^2	df	CFI	TLI	RMSEA	Corr
Balducci et al. (2010) - study 1	Italy	N = 668 M_{age} = NA	3-factor CFA[b]	.86	.89	.76	58.600	20	.982	—	.077	.70
Balducci et al. (2010) - study 2	The Netherlands	N = 2,213 M_{age} = 34.9	3-factor CFA[b]	—	—	—	175.300	22	.973	—	.080	—
Breevaart et al. (2012)	The Netherlands	N = 271 M_{age} = 36.75	3-factor CFA[a]	—	—	—	317.400	48	.960	—	.060	.94
Chaudhary et al. (2012)	India	N = 438 M_{age} = 33.24	3-factor CFA[b]	.60	.65	.59	45.530	23	.976	.963	.047	.95
de Bruin & Henn (2013)	South Africa	N = 369 M_{age} = 35.3	partial Bifactor-CFA	—	—	—	38.763	23	.993	.996	.044	—
Fong & Ng (2012)	Hong Kong	N = 992 M_{age} = 43.2	3-factor CFA[a]	.74	.77	.70	172.270	24	.930	.900	.080	.78-.95
Fong & Ho (2015)	Hong Kong	N = 1,112 M_{age} = NA	partial Bifactor-CFA	—	—	—	86.400	33	.945	—	.075	—
Hallberg & Schaufeli (2006)*	Sweden	N = 186 M_{age} = 41	3-factor CFA[c]	.85	.89	.76	93.870	24	.970	—	.130	.92
Hallberg & Schaufeli (2006)*	Sweden	N = 186 M_{age} = 41	1-factor CFA	.85	.89	.76	111.140	27	.970	—	.130	
Ho Kim et al. (2017) - study 1	South Korea	N = 307 M_{age} = 39.2	3-factor EFA	.92	.90	.91	34.801	12	.985	.954	.079	—
Ho Kim et al. (2017) - study 2	South Korea	N = 342 M_{age} = 37.6	3-factor CFA[c]	.91	.89	.90	92.528	24	.966	.949	.091	.77

Authors	Nation	Sample	Analysis	Vigor (α)	Dedication (α)	Absorption (α)	χ^2	df	CFI	TLI	RMSEA	Corr
Klassen et al. (2012)	Combined groups	N = 856 M_{age} = NA	1-factor CFA	—	—	—	267.760	126	.970	—	.040	—
Kulkowski (2019)	Poland	N = 1420 M_{age} = NA	3-factor CFA[c]	.85	.79	.77	497.200	24	.940	—	.120	.71
Lathabhavan et al. (2017)	India	N = 467 M_{age} = 38	3-factor CFA[a]	.90	.89	.95	45.740	24	.990	.990	.040	.44
Littman-Ovadia & Balducci (2013)	Israel	N = 252 M_{age} = 33.7	3-factor CFA[c]	.85	.86	.84	67.471	24	.988	—	.085	.87
Lovakov et al. (2017)	Russia	N = 1,783 M_{age} = 36.36	3-factor CFA[b]	.79	.87	.75	319.730	22	.950	.920	.090	.73
Mills et al. (2012) - study 1	USA	N = 98 M_{age} = 41.06	3-factor CFA[c]	.83	.84	.70	46.320	24	.950	—	.100	.66
Mills et al. (2012) - study 2	USA	N = 120 M_{age} = 39	1-factor CFA	.76	.48	.49	55.910	27	.940	—	.090	.71
Moreira-Fontán et al. (2019)	Spain	N = 350 M_{age} = 48.40	3-factor CFA[a]	.83	.85	.83	—	—	.982	—	.074	.78
Nerstad et al. (2010)	Norway	N = 1,266 M_{age} = 40.8	3-factor CFA[a]	.65	.84	.83	178.420	24	.990	—	.070	.86
Panthee et al. (2014)	Nepal	N = 438 M_{age} = 30.85	3-factor CFA[a]	.60	.78	.76	90.110	24	.950	.930	.070	.57
Petrovic et al. (2017)	Serbia	N = 860 M_{age} = 40	3-factor CFA[c]	.85	.87	.62	116.546	24	.868	—	.067	.70
Schaufeli et al. (2006)	10 countries	N = 14,521 M_{age} = 40.3	3-factor CFA[a]	.77	.85	.78	3227.290	240	.960	—	.030	.92

Authors	Nation	Sample	Analysis	Vigor (α)	Dedication (α)	Absorption (α)	χ^2	df	CFI	TLI	RMSEA	Corr
Seppälä et al. (2009)	Finland	N = 9,404 M_{age} = NA	3-factor CFA[a]	—	—	—	1328.650	120	.980	—	.076	.83-.97
Simbula et al. (2013)	Italy	N = 488 M_{age} = NA	3-factor CFA[b]	.80	.85	.79	94.910	22	.970	—	.080	.77
Sinval et al. (2018) - study 1	Brazil and Portugal	N = 1,046 M_{age} = 35.57	Second-order CFA	.93	.93	.90	409.919	25	.998	.997	.121	—
Sinval et al. (2018) - study 2	Portugal	N = 3,623 M_{age} = 33.35	Second-order CFA	.90	.91	.82	498.849	24	.998	.997	.074	—
Vallières et al. (2017)	Sierra Leone	N = 323 M_{age} = NA	1-factor CFA	—	—	—	49.121	27	.911	.882	.050	—
Vazquez et al. (2015)	Brazil	N = 1,167 M_{age} = 36.8	3-factor CFA[c]	—	—	—	472.790	66	.980	.980	.120	—
Villotti et al. (2014)	Italy	N = 310 M_{age} = 41.17	3-factor CFA[c]	.86	.90	.85	75.710	24	.986	—	.092	.82
Wefald et al. (2012)	USA	N = 382 M_{age} = NA	3-factor CFA[c]	.87	.84	.78	250.150	24	.910	—	.160	.75
Yusoff et al. (2013)	Pakistan	N = 400 M_{age} = NA	3-factor CFA[a]	.87	.84	.90	25.300	9	.990	—	.064	.63
Zecca et al. (2014)	Switzerland	N = 661 M_{age} = 40.86	3-factor CFA[b]	.81	.90	.82	92.910	21	.980	.970	.070	.71
Zeijen et al. (2018)	The Netherlands	N = 372 M_{age} = 40.75	3-factor CFA[c]	.88	.91	.83	183.265	23	.940	—	.156	.78

Notes. α = Cronbach's α; CFA = confirmatory factor analysis; [a] Good fit without manipulation; [b] Modified; [c] Unsatisfactory fit indices without manipulation; * Authors accepted both the 3-factor and the 1-factor models as final models.

IX./3. Table S2. Parameter Estimates from the Correlates Measurement Model Estimated in Sample 1

	NF (λ)	AS (λ)	RS (λ)	CS (λ)	AF (λ)	RF (λ)	CF (λ)	TI (λ)	δ
Autonomy satisfaction (AS)									
Item 1	**.514****	**.398****	.067	-.100	-.079	.088	.026		.549
Item 7	**.548****	**.383****	-.034	.176*	.081	.116	.019		.822
Item 13	**.588****	**.545****	.075	.113	-.031	.040	-.041		.673
Item 19	**.559****	**.425****	.139	-.085	-.159*	-.061	-.080		.142
Relatedness satisfaction (RS)									
Item 3	**.454****	.070	**.319****	-.082	-.059	-.063	.018		.378
Item 9	**.397****	.075	**.704***	-.014	.069	.026	.161		.400
Item 15	**.387****	.079	**.683****	.072	.029	-.196**	-.030		.500
Item 21	**.508****	-.036	**.411****	-.258**	-.004	-.130	-.068		.401
Competence satisfaction (CS)									
Item 5	**.533****	-.131	-.108	**.511****	.032	.123	.180		.310
Item 11	**.351****	.286**	.003	**.547****	.104	.054	.013		.534
Item 17	**.620****	.210	-.074	**.039**	-.039	.030	-.145		.482
Item 23	**.514**	-.094	-.077	**.470****	.039	.059	-.303		.526
Autonomy frustration (AF)									
Item 2	**.041**	.087	-.041	-.121	**.372***	.074	.093		.335
Item 8	**-.623****	-.082	.066	.131*	**.407**	.006	-.131		.318
Item 14	**-.470****	-.005	.057	.061	**.673****	-.013	.023		.332
Item 20	**-.572****	-.353*	-.007	.176*	**.229**	.064	-.091		.439
Relatedness frustration (RF)									
Item 4	**-.428****	.023	-.069	.001	.085	**.813****	-.033		.541
Item 10	**-.573****	.190	-.168	.160	.050	**.191**	-.094		.356
Item 16	**-.644****	.061	-.082	.179**	-.095	**.307****	.037		.444
Item 22	**-.584****	.006	-.376**	.171**	-.068	**.202***	.070		.453
Competence frustration (CF)									
Item 6	**-.534****	.254	.290	-.359**	-.094	.053	**-.162**		.484
Item 12	**-.652****	.081	.166	-.087	-.030	-.050	**.067**		.438
Item 18	**-.619****	-.011	.197	-.207	-.068	-.019	**.417**		.403
Item 24	**-.588****	.013	.280	-.178*	-.108	.003	**.086**		.525
Turnover intentions (TI)									
Item 1								.820**	.328
Item 2								.941**	.115
Item 3								.956**	.086
ω	.933	.584	.727	.570	.665	.561	.225	.933	

Notes. *p < .05; **p < .01; NF = need fulfillment; λ = Factor loading; δ = Item uniqueness; Target factor loadings are in bold.; ω = model-based omega composite reliability

IX./3. Table S3. Parameter Estimates from the Correlates Measurement Model Estimated in Sample 2

	WA (λ)	WS (λ)	δ
Work addiction (WA)			
Item 1	.466**		.783
Item 2	.577**		.667
Item 3	.532**		.717
Item 4	.573**		.672
Item 5	.601**		.639
Item 6	.676**		.544
Work satisfaction (WS)			
Item 1		.903**	.184
Item 2		.631**	.602
Item 3		.866**	.249
Item 4		.608**	.630
Item 5		.808**	.348
ω	.745	.879	

Notes. *$p < .05$; **$p < .01$; λ = Factor loading; δ = Item uniqueness; ω = model-based omega composite reliability.

IX/4. APPENDIX OF STUDY 4

IX/4. Table S1. Goodness-of-fit indices for the estimated models

Model	χ^2 (df)	CFI	TLI	RMSEA 90% CI
Preliminary measurement model	763.760* (362)	.919	.909	.057 [.052, .063]
Fixed-effect model	1105.553* (562)	.895	.881	.056 [.051, .060]
Proposed model	771.895* (387)	.917	.907	.057 [.051, .062]

Notes. *$p < .05$; N = 311, χ^2: = robust chi-square test of exact fit, df: degrees of freedom, CFI: Comparative fit index, TLI: Tucker–Lewis index, RMSEA: root mean square error of approximation, 90% CI: 90% confidence interval of the RMSEA

IX/4. Table S2. Standardized and unstandardized estimates of the Fixed-effect Model

	Work Engagement			Opportunity to Transfer			Motivation to Transfer			Training Transfer		
	b	95% CI	ß	b	95% CI	ß	b	95% CI	ß	b	95% CI	ß
Company 2	-.121	[-.37, .128]	-.053	.326	[-.149, .801]	.085	.112	[-.423, .648]	.026	-.087	[-.427, .254]	-.021
Company 3	.267*	[.005, .530]	.128*	.344	[-.189, .876]	.098	.176	[-.421, .773]	.044	-.172	[-.461, .117]	-.046
Company 4	.011	[-.350, .372]	.003	.605	[-.226, 1.437]	.090	.701	[-.013, 1.414]	.092	-.471*	[-.802, -.141]	-.065*
Company 5	-.304*	[-.599, -.009]	-.108*	.240	[-.295, .775]	.051	-.165	[-.818, .487]	-.031	.293	[-.004, .626]	.058
Company 6	.142	[-.127, .412]	.063	-.091	[-.599, .416]	-.024	-.428	[-.992, .137]	-.099	.247	[-.132, .626]	.060
Company 7	-.036	[-.302, .231]	-.019	-.196	[-.669, .277]	-.062	.053	[-.446, .552]	.015	.422*	[.085, .760]	.125*
Company 8	-.217	[-.485, .051]	-.098	-.090	[-.562, .381]	-.024	.165	[-.411, .741]	.039	.245	[-.063, .553]	.061
Time Lag	.036	[-.056, .129]	.051	-.147	[-.310, .015]	-.124	-.187*	[-.365, -.001]	-.139*	.084	[-.015, .183]	.066
JR	.392*	[.251, .532]	.439*	.357*	[.100, .614]	.238*	.368*	[.122, .614]	.218*	.005	[-.157, .168]	.003
JD	-.239*	[-.460, -.018]	-.171*	.227	[-.218, .672]	.097	-.169	[-.668, .330]	-.064	-.234	[-.515, .046]	-.093
WE				.341*	[.055, .628]	.203*	.226	[-.060, .511]	.119	-.079	[-.243, .086]	-.044
OTT										.629*	[.408, .849]	.586*
MTT										.298*	[.125, .471]	.314*
R^2		.310			.174			.140			.715	

Notes. * $p < .05$; Companies are represented as dummy coded variables (k-1 = 7); Time Lag: Days elapsed between training and data collection; JR = Job Resources; JD = Job Demands; WE = Work Engagement; MTT = Motivation to Transfer; OTT = Opportunity to Transfer; b = unstandardized regression coefficients; ß = standardized regression coefficients; 95% CI = bias-corrected confidence intervals.

IX/4. Table S3. Standardized Parameter Estimates from the Preliminary Measurement Model

	JR (λ)	JD (λ)	WE (λ)	MTT (λ)	OTT (λ)	TT (λ)	δ
Job Resources (JR)							
Item 1. I get enough feedback about the quality of my performance.	.759**						.424
Item 2. My performance is rewarded properly.	.711**						.494
Item 3. I can decide myself how to perform my work.	.410**						.832
Item 4. Employees and managers decide together what everybody has to do.	.526**						.723
Item 5. My supervisor supports his/her employees.	.748**						.441
Job Demands (JD)							
Item 1. My work taxes me too much physically.		.504**					.746
Item 2. I never have enough time to perform my tasks.		.449**					.798
Item 3. My contact with persons to whom I have to offer services is demanding.		.476**					.773
Item 4. It is physically taxing for me to get used to my working times.		.506**					.744
Item 5. My physical working conditions—climate, light, noise, design of the working place, and material—are not good.		.338**					.886
Work Engagement (WE)							
Item 1. At my work, I feel bursting with energy.			.749**				.439
Item 2. At my job, I feel strong and vigorous.			.795**				.368
Item 3. I am enthusiastic about my job.			.875**				.234
Item 4. My job inspires me.			.857**				.265
Item 5. When I get up in the morning, I feel like going to work.			.745**				.445
Item 6. I feel happy when I am working intensely.			.607**				.631
Item 7. I am proud of the work that I do.			.747**				.442
Item 8. I am immersed in my work.			.720**				.481
Item 9. I get carried away when I am working.			.784**				.386

	JR (λ)	JD (λ)	WE (λ)	MTT (λ)	OTT (λ)	TT (λ)	δ
Motivation to Transfer (MTT)							
Item 1. After completing the training, I was excited to use the techniques I learned there.				.741**			.451
Item 2. By the end of the training, I felt that I would love to use what I learned immediately in my job.				.660**			.565
Item 3. By the end of the training, I was determined to use the new techniques I learned at the training.				.875**			.235
Opportunity to Transfer (OTT)							
Item 1. At work, I was actively seeking problems I could solve by using my new knowledge.					.905**		.181
Item 2. My workplace provided me with tasks allowing me to practice what I had learned at the training.					.909**		.174
Item 3. At work, I created opportunities for myself to utilize what I had learned.					.823**		.323
Training Transfer (TT)							
Item 1. In my workplace, I used what I learned during the training.						.909**	.174
Item 2. I tried the techniques at work I had learned at the training.						.924**	.145
Item 3. At my workplace, I applied the methods acquired during training.						.953**	.091
Item 4. In my day-to-day work, I implement the knowledge that I had acquired at the training.						.887**	.213
ω	.773	.567	.928	.805	.911	.956	

Notes. *$p < .05$, **$p < .01$; λ = Factor loading; δ = Item uniqueness; ω = model-based omega composite reliability.