

Lüthi, F., & Stalder, B. E. (2018). Situational and individual resources predict learning opportunities and career outcomes in VET. In C. Nägele & B. E. Stalder (Eds.), *Trends in vocational education and training research. Proceedings of the European Conference on Educational Research (ECER), Vocational Education and Training Network (VETNET)* (pp. 226–237). <https://doi.org/10.5281/zenodo1407753>

Situational and Individual Resources Predict Learning Opportunities and Career Outcomes in VET

Fabienne Lüthi*

University of Teacher Education, fabienne.luethi@phbern.ch

Barbara E. Stalder

University of Teacher Education, barbara.stalder@phbern.ch

Abstract

Situational and individual resources play a crucial role in learning in vocational education and training (VET). Drawing from the Job Demands-Resources (JD-R) model, we explore work-related and school-related resources of apprentices' learning environments among 715 learners in Switzerland, and we analyse how resource profiles are related to learning opportunities and career outcomes. Applying latent profile analysis (LPA), we found four groups that are characterised by different patterns and levels of situational resources, including autonomy, instruction quality, and demands. Structure equation modelling (SEM) showed that resource profiles and individual resources (core self-evaluations, CSE) are associated with apprentices' learning opportunities at both learning locations and, particularly, that having low resources hampers learning. As expected, learning opportunities at work and school positively affect satisfaction with VET and occupational commitment and reduce risks of resignation about VET. The results highlight the importance of providing apprentices with challenging, empowering and supportive work and school environments to ensure learning and positive career development.

Keywords

learning environments, job resources, core self-evaluations, career development

1 Introduction

Learning at school and at the workplace is a central characteristic of dual vocational education and training (VET) programmes. Active participation at both learning locations is frequently seen as crucial for apprentices' competence development, job satisfaction and identity formation (Akkerman & Bakker, 2012; Klotz, Billett, & Winther, 2014). Engaging in learning activities at work and at school should enable apprentices to meet increasing demands of work tasks, of companies and the labour market (Mulder, Messmann, & König, 2015) and to keep up with the rapidly growing and changing society and economy (Kyndt & Baert, 2013). It is thus essential to provide learners with work and school environments conducive to learning and to

* Corresponding author

encourage them to profit from learning resources offered at both learning locations (Messmann & Mulder, 2015).

According to the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007), resources fulfil basic human needs (Ryan & Deci, 2000) and have a motivational potential, which may lead to increased learning effort, engagement and successful goal achievement (Bakker, Demerouti, & Ten Brummelhuis, 2012). High demands may exhaust employees when meeting those demands is too difficult, but can also be positive, if individuals value them as challenging (Elfering, Semmer, Tschan, Kälin, & Bucher, 2007). Learning seems most effective when both job resources and demands are high, and when an individual is actively and autonomously involved in a work task (De Witte, Verhofstadt, & Omeij, 2007; Taris & Feij, 2004). Active participation in learning at work and school thus not only depend on resources provided by employers and schools (i.e., situational resources), but also on individual resources, such as learners' educational background or their capability and confidence to productively use their environment for learning (Billett, 2001).

Research has found that resources related to work and learning, as well as task-related demands vary from one vocational field to another, and between workplaces and schools (Filliettaz, 2012; Fuller & Unwin, 2003; Stalder, 2003). Most of the previous research is, however, limited, insofar that studies often focus on either workplace environments or on school environments, which might be due to various VET systems in Europe. This runs counter to the assumption that learning and boundary crossing between workplaces and schools is essential for learners' vocational development (Schaap, Baartman, & de Bruijn, 2011; Stalder & Lüthi, *in press*), and that individuals are co-responsible for positive learning processes and outcomes (Billett, 2001).

This paper aims to contribute to filling this lack of research. Drawing from the JD-R model (Bakker & Demerouti, 2007), we examine work- and school-related learning environments of apprentices, learners' perception of learning opportunities at the workplace and at school, and their satisfaction and commitment regarding VET. First, we explore patterns (profiles) of situational resources in learning environments by using latent profile analyses (LPA). Second, we test the relation between resource profiles, individual resources and learning opportunities, and third, we examine the effect of learning opportunities on occupational commitment, VET-related satisfaction and resignation one year later. Overall, our study advances a more integrated view about variations in learning environments offered to apprentices, and how they contribute to apprentices' positive career development.

1.1 Situational resources and demands

Situational resources are aspects at the level of the task, the supervisor, trainer or teacher, the group, and the organisation which are functional in achieving work goals, help to deal with challenges and demands, and allow for continuous professional development (Bakker & Demerouti, 2007; De Witte et al., 2007; Elfering et al., 2016). Work and school environments that offer many resources foster individuals' willingness to dedicate themselves to the task (Demerouti & Bakker, 2011) and to engage in non-formal and formal learning (Kyndt & Baert, 2013). For example, supervisors, teachers or experienced co-workers provide resources by sharing information and giving feedback, by direct instruction, guidance and support, and by stimulating learners' reflection on tasks, processes and learning outcomes (Coetzer, 2007; Collins, 2006; Nikolova, Van Ruysseveldt, De Witte, & Syroit, 2014). Or, adequate decision-making possibilities in terms of tasks, times, or means (i.e., autonomy) can be used as resource for learning, as they encourage learners to engage in exploration and experimentation and enable them to regulate their own learning in accordance with their interests and capabilities (Hackman, 1980; Zimmerman & Kitsantas, 2005).

Situational demands refer to potentially stressful aspects of work or school (e.g., workload, time pressure, task complexity) that can cause problems, especially if individuals have low autonomy over the job (De Witte et al., 2007; Taris & Kompier, 2014). While many studies on job demands have focused on negative outcomes, such as burnout (Bakker & Demerouti, 2007), others have found that higher demands are positively related to well-being (Taris & Feij, 2004), and that a certain amount of demands is necessary to motivate young workers in their learning process (Bakker et al., 2012; Raemdonck, Gijbels, & van Groen, 2014). In that sense, having enough but not over-challenging demands may be interpreted as a resource for learning, as they challenge learners and motivate them to learn new skills and engage in problem-solving (Taris & Feij, 2004).

Studies with apprentices have consistently shown that the provision of high situational resources positively affect learners' evaluation of their workplace as a place, where they can learn a lot (Nägele, 2013). Having access to high instruction quality, guidance and support, and being able to work on challenging and varied tasks in a self-determined manner is linked to plentiful opportunities for learning, increased well-being, and positive achievement (Filliettaz, 2012; Nore, 2015; Stalder & Schmid, 2016). Also, research has found that learning-relevant resources are interrelated (e.g., that a high instruction quality of a trainer is coupled with a positive feedback culture of that trainer), which leads to different overall patterns of learning resources. Such resource patterns vary considerably within and between learning places and provide different levels of learning possibilities (Fuller & Unwin, 2003). For example, Stalder and Schmid (2016) analysed patterns of resources and demands at the workplace and school with a sample of apprentices. They found four distinct resource profiles: Overall high respectively low resources characterised two of them, high resources at one of the learning locations, but few resources at the other location characterised the other two. The use of person-oriented rather than a variable-oriented approach seems thus fruitful to analyse the impact of different learning environments on learning opportunities (Eye & Bogat, 2006). We therefore assume that apprentices' learning environment can be described by distinct profiles and that these profiles relate differently to learning opportunities. We propose:

Hypothesis 1: Apprentices in profiles characterised by high situational resources will have higher levels of learning opportunities at work and school compared to apprentices in environments with lower resources.

1.2 Individual resources: Core self-evaluations

Individual resources refer to characteristics of the worker or learner, which support him or her in coping effectively with demanding situations and using their environments for learning and individual and professional development (Judge, Locke, Durham, & Kluger, 1998). Apart from cognitive abilities, which strongly influence learning and performance (Schmidt & Hunter, 1998), some of the most critical individual resources are core self-evaluations (CSE). CSE are fundamental premises that individuals hold about themselves and their self-worth (Judge, Erez, Bono, & Thoresen, 2003). They include four dispositional traits: Self-esteem, generalised self-efficacy, internal locus of control, and emotional stability, which together build a higher-order construct (Judge et al., 2003).

A vast amount of research has demonstrated that CSE is quite stable over time (Dormann, Fay, Zapf, & Frese, 2006) and that it is associated with overall positive evaluations of the workplace (Judge & Bono, 2001; Wu & Griffin, 2012). Individuals high in CSE are expected to be more confident to cope successfully with work tasks. They may be less likely to withdraw from complex jobs if they experience failure because they believe in their abilities (Judge, Bono, & Locke, 2000). In contrast, individuals with low CSE might perceive jobs with high demands as stressful and may hesitate to engage in new tasks (Judge et al., 2000). Hence, high CSE may be linked to behaviour at the workplace and at school that makes it also more likely to gain in job-

related or school-related resources (Elfering et al., 2016). Similarly, because individuals with high CSE trust in their capacity to shape their environment, it can be assumed that high CSE is linked to higher learning opportunities. For example, if an apprentice dares to ask for information and advice – and given that an adequate response of teachers, trainers or colleagues follows this request – it is likely that the same apprentice would have higher opportunities for learning at the workplace or school. We thus assume:

Hypothesis 2: CSE and resource profiles are correlated, such that apprentices with high CSE will be found more often in profiles characterised by high resources than apprentices with lower levels of CSE.

Hypothesis 3: The higher apprentices' core self-evaluations, the higher are their learning opportunities at work and school.

1.3 Career outcomes

The development of vocational competencies and the establishment of a vocational identity are essential goals of apprenticeships and correspond to a basic need of individuals (Klotz et al., 2014; Ryan & Deci, 2000). Research has shown that needs' fulfilment related to learning and professional development increase positive attitudes towards the job (e.g., job satisfaction, job engagement), the occupation (e.g., occupational commitment), and the organisation (e.g., organisational commitment) (Warr & Inceoglu, 2012). Employees experiencing high levels of job resources and ample opportunities for learning report higher levels of job satisfaction (Keller & Semmer, 2013; Shimazu, Shimazu, & Odahara, 2004), and higher levels of commitment (Lee, Carswell, & Allen, 2000).

Similarly, studies with learners in VET found evidence that situational resources provided at the workplace and school affect apprentices satisfaction with the apprenticeship (Messmann & Mulder, 2015; Stalder & Schmid, 2016; Taris & Kompier, 2014) and engagement (Billett, 2001; Fuller & Unwin, 2003), and that the provision of learning opportunities plays a significant role. Stalder and Carigiet (2014) found for example that higher learning opportunities at the workplace fosters the satisfaction with the apprenticeship at a general level and reduces apprentices' resignation regarding VET. Learners with high learning opportunities did less often report that they are satisfied, because "It could be worse" or because they think that "as an apprentice, you can't expect much". We assume:

Hypothesis 4: Higher levels of learning opportunities at work and VET-school lead to higher occupational commitment and satisfaction and reduces feelings of resignation about VET.

2 Methods

2.1 Participants

To test our hypotheses, we rely on longitudinal data from the Swiss youth panel study TREE (Transition from Education to Employment) (Stalder, Meyer, & Hupka-Brunner, 2011). The panel focuses on the post-compulsory educational and labour market pathways of a school leavers' cohort in Switzerland including more than 5'500 learners. We took a subsample of those 715 learners (55% female) that were enrolled in an apprenticeship programme in 2002 and were in their second (t1) year in 2002 or 2003 and their third year (t2) in 2003 or 2004. Mean age at t1 was 17.53 years (SD = .65).

2.2 Measures

Situational resources at work and school were assessed with three indicators each, including autonomy, instruction quality and demands. *Autonomy* at work and school was measured with

three items each (e.g., I take part in decision-making about which tasks I have to do; I can decide what I have to learn) (Prümper, Hartmannsgruber, & Frese, 1995). *Instruction quality* of trainers and teachers was assessed with six items each (e.g., If I ask a question, my instructor has time to explain; Usually my teacher tells me whether I solved a task well) (4-point scale). *Demands* were assessed with five items each, distinguishing between qualitative demands related to the difficulty and complexity of tasks (e.g., I must do tasks, which are too complicated for me) and quantitative demands (e.g., I have too much to do) (Prümper et al., 1995).

Learning opportunities at the workplace were measured by four items, *learning opportunities at school* by three items (e.g., At work/at school I can learn a lot; lessons at school are varied) (Prümper et al., 1995; Stalder et al., 2011).

Core self-evaluations (CSE) were built by three indicators: General self-efficacy (e.g., I can always manage to solve difficult problems if I try hard enough), self-esteem (e.g., I feel that I am a person of worth) and negative affectivity (e.g., Over the last month, did you feel annoyed? Values inverted from negative to positive). Negative affectivity is typically assumed to be a proxy for neuroticism (Judge, Heller, & Klinger, 2008).

General *satisfaction with VET* (e.g., In general, how satisfied are you with your apprenticeship?) and *VET-related resignation* (e.g., As an apprentice one cannot expect much) were both measured with three items on a 7-point scale (Bruggemann, Groskurth, & Ulich, 1975). *Occupational commitment* included three items (e.g., I am proud of the occupation, I'm trained in), measured on a 4-point scale. All items were rated on a scale from 1 (very rare/never) to 5 (very often/always), exceptions are indicated. Table 1 summarises the means, standard deviations, and correlations of all measures.

Table 1 Means, standard deviations and intercorrelations of assessed constructs (N=715)

		<i>M</i>	<i>SD</i>	<i>N</i>	1	2	3	4	5	6	7	8	9	10	11	
1	Autonomy at work	t1	3.36	.80	700											
2	Autonomy at school	t1	2.46	.82	651	.15										
3	Demands at work	t1	2.51	.56	701	.00	.02									
4	Demands at school	t1	2.27	.75	652	-.07	-.04	.20								
5	Instruction quality at work	t1	4.00	.82	448	.31	.02	-.06	-.06							
6	Instruction quality at school	t1	3.70	.78	598	.06	.19	.07	-.16	.07						
7	Core self-evaluations	t1	3.58	.46	715	.22	.04	-.14	-.39	.19	.15					
8	Learning opportunities at work	t1	4.01	.72	698	.38	.12	.10	-.12	.33	.15	.37				
9	Learning opportunities at school	t1	3.62	.65	651	.02	.20	-.01	-.06	.08	.37	.20	.33			
10	General satisfaction with VET	t2	4.60	1.13	715	.21	.15	-.08	-.13	.31	.14	.18	.37	.27		
11	Resignation about VET	t2	2.77	1.17	715	-.25	-.03	.17	.21	-.22	-.14	-.37	-.28	-.18	-.40	
12	Occupational commitment	t2	3.22	.63	648	.14	.07	-.08	-.15	.30	.08	.16	.31	.20	.56	-.36

Note. Instruction quality was recoded from a 4-point to a 5-point scale to fit the other indicators of the resource profiles. Correlations below $-.10$ respectively above $.10$ are significant with $p < .05$.

3 Results and discussion

3.1 Latent profile analysis

Before hypotheses testing, we performed latent profile analysis (LPA) in MPlus 7.4 (Muthén & Muthén, 1998-2017) following Nylund, Asparouhov, and Muthén (2007) to examine the existence of latent subgroups with homogenous profiles of situational resources and demands. We integrated autonomy, instruction quality and demands at work and school as latent indicators of situational resources in the LPA. To choose the best fitting model (Figure 1), we

considered the sample-sized adjusted Bayesian information criterion (SABIC) (Schwartz, 1978), the parametric bootstrapped likelihood ratio test (BLRT), and the Vuong-Lo-Mendell-Rubin likelihood ratio test (VLMRT) (Lo, Mendell, & Ruben, 2001). A good fitting model is usually indicated by lower AIC, BIC, and SABIC values compared to other model solutions. Besides, LMR and BLRT statistics should be significant at $p < .05$ (Geiser, 2011). Based on these fit indices, the data suggested a two- or four-profile solution. Considering theoretical aspects, the interpretability of the profiles and the class sizes, we decided on a four-profile solution.

Figure 1 shows the means of the four profiles of situational resources. Note that means were centre-mirrored, such that "high" corresponds to the original value 5, "medium" to the original value 3, and "low" to the original value 1. The four profiles vary most strongly concerning instruction quality and autonomy at the workplace and are only slightly different concerning work and school demands. Demands are generally low to moderate at both learning locations.

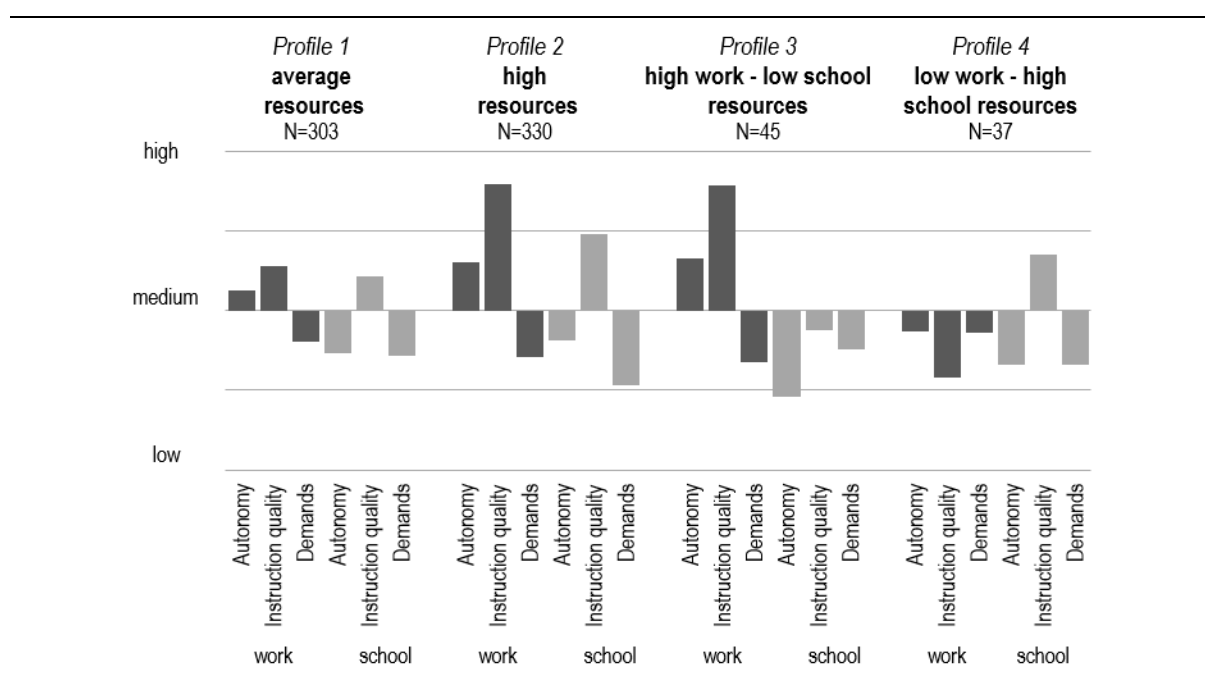


Figure 1 Latent profiles of learning resources at work and at school at time 1

The first profile called “average resources” includes 303 apprentices (42.4%). It is characterised by an instruction quality a little above the mid-level at both learning locations and moderate autonomy at the workplace. This means, e.g., that trainers and teachers don't often have time to instruct learners, or that learners can only occasionally co-decide on what they should work or learn. The second profile with 330 apprentices (38.2%), in contrast, is characterised by learning environments, where trainers and teachers instruct and support apprentices highly and where learners have ample possibilities to decide autonomously on tasks at work and school. We label this profile “high resources”.

The third and fourth profile cover smaller groups of apprentices with 45 (6.3%) and 37 (5.2%) learners. While in profile 3 – like profile 2 – high resources are available at the workplace, resources at school seem to be limited: The instruction quality at school is mediocre and autonomy very low. Apprentices with profile 4 judge their resources at the workplace, and especially the quality of their trainers’ instruction very low compared to all other profiles. But they evaluate the quality of school teachers’ instruction nearly as high as apprentices in

profile 2. We call profile 3 “high work – low school resources” and profile 4 “low work – high school resources”.

3.2 Structure equation model

To test our hypotheses, we applied structural equation modelling, including resource profiles and CSE (t1) as predictors of learning opportunities at school and at work (t1), and regressing general satisfaction and resignation regarding VET and occupational commitment (t2) on learning opportunities. Resource profiles were dummy coded, whereby profile 1 “average resources” was used as reference group. This first model did not show an acceptable fit ($\chi^2 = 91.60$; $df = 12$; RMSEA = .09; SRMR = .05; CFI = .88; TLI = .71). After examination of modification indices, we introduced an additional path from CSE to resignation. The fit of the adapted model was acceptable ($\chi^2 = 34.48$; $df = 11$; RMSEA = .05; SRMR = .04; CFI = .96; TLI = .91). Values near and above .95 for CFI and TLI and below .08 for RMSEA and SRMR indicate a good fit (Hu & Bentler, 1999). The final model is presented in Figure 2.

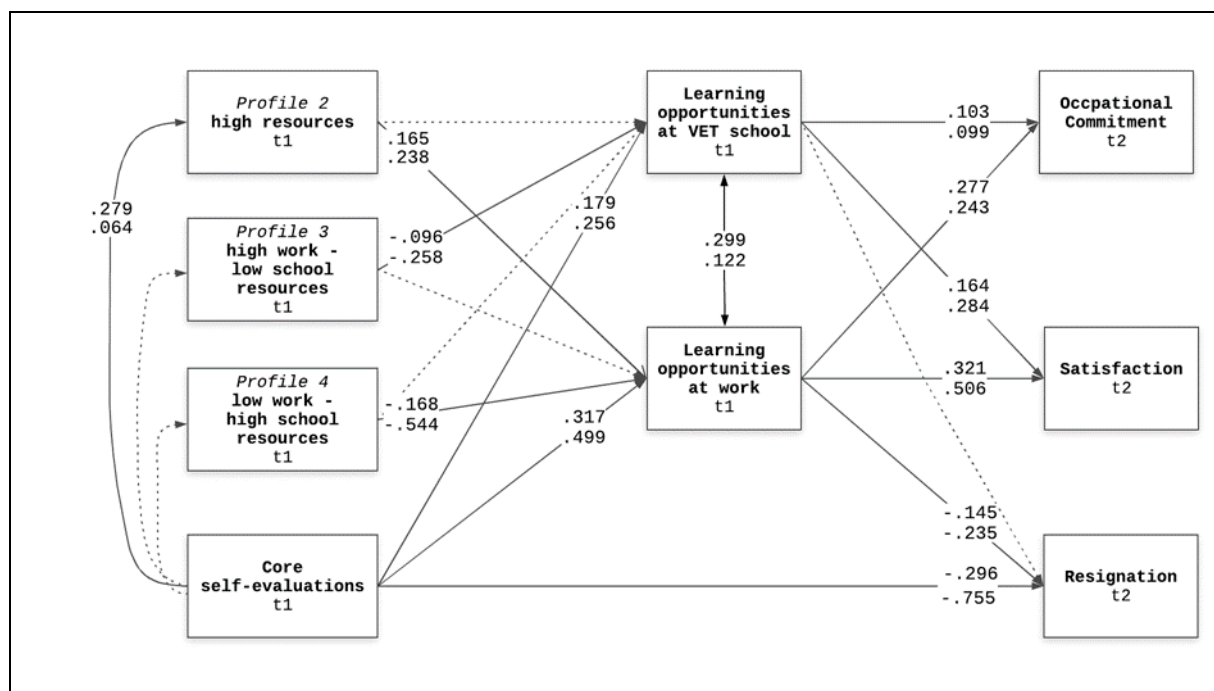


Figure 2 Standardized (above) and unstandardized (below) path coefficients and correlations for the tested model. Solid lines represent significant ($p < .05$), dashed lines non-significant effects ($p > .05$).

In hypothesis 1 we assumed that apprentices with profiles high in situational resources have higher levels of learning opportunities at work and at school. Having found four distinct resource profiles, we can specify our assumption. We presume that high resources are related to high learning opportunities at the corresponding learning location, such that higher work-related resources (profiles 2 and 3) would be associated with higher learning opportunities at the workplace, and higher school-related resources (profiles 2 and 4) would be associated with higher learning opportunities at school, if compared with apprentices with overall average resources (profile 1). Figure 2 shows that this assumption is only partly supported. In line with what we expected, apprentices with profile 2 (i.e., high resources at both locations) have higher learning opportunities at the workplace than apprentices in average resourced environments (profile 1) ($B = .238$, $p < .001$). This is, however, not the case for apprentices in profile 3, whose work-related resources are high too: Their learning opportunities at the workplace do not differ

significantly from those of the apprentices with profile 1 ($B = .168, p > .05$). Furthermore, the assumption that higher school resources would be associated with higher learning opportunities at school is not supported; neither for profile 2 nor for profile 4. The structural conditions of Swiss apprenticeships might explain this. In dual VET programmes, most learners spend only one day per week at the VET school. The pre-set vocation-based curricula strongly influence learning opportunities, and possibilities for individualisation are limited (Stalder & Nägele, 2011). In general, teaching practice might thus affect learning opportunities at school to a lesser extent compared to trainer's instruction and guidance at the workplace. Besides, profile 2 is not only the profile with the highest resources but also with the lowest demands at school. It is possible that these apprentices are under-challenged, and in turn, can but little profit from lessons at school. Interestingly, it is less the "surplus" of resources, but the relative lack of resources that seem to affect learning opportunities. Apprentices with low levels of school resources (profile 4) have fewer learning opportunities at school ($B = -.258, p < .001$); and apprentices with low levels of work resources (profile 4) have fewer learning opportunities at work ($B = -.544, p < .001$) compared to apprentices with average resources. In general, the results suggest supporting other findings, which show that workplace learning is more effective when school-based learning is transferred and integrated into learning at the workplace (Schaap et al., 2011; Stalder & Lüthi, in press).

Hypothesis 2 states that CSE and resources profiles are correlated, such that apprentices with high CSE will be found more often in profiles characterised by high resources than apprentices with lower levels of CSE. This hypothesis was partly supported. The correlation was significant between CSE and profile 2 ($r = .279, p < .001$). This could mean that apprentices high in CSE evaluate their workplace and school resources more positively (Judge & Bono, 2001; Wu & Griffin, 2012), and might be more confident and able to ask for feedback and more autonomy. Or vice-versa, it is possible that high resources boost individuals' CSE. CSE and profiles 3 and 4 were not correlated.

Results supported hypothesis 3, which proposed that CSE and learning opportunities are related. CSE was linked to higher levels of learning opportunities at work ($\beta = .317, p < .001$) and at school ($\beta = .179, p < .001$), which suggests that apprentices with high CSE might engage more in new or more challenging tasks with higher learning potentials (Judge & Hurst, 2007).

According to hypothesis 4, we expected that higher levels of learning opportunities at work and school predict occupational commitment, satisfaction, and resignation one year later. Apart from the effect of school-related learning opportunities on occupational commitment, which was not significant, hypothesis 4 was fully supported. Higher learning opportunities positively influenced satisfaction with VET in the following year ($\beta_{work} = .321, p < .001$; $\beta_{school} = .164, p < .001$), and occupational commitment ($\beta_{work} = .277, p < .001$; $\beta_{school} = .103, p < .001$). Additionally, the higher apprentices' levels of work-related learning opportunities were, the less they felt resigned about VET one year later ($\beta = -.145, p < .001$). This indicates that learning at the workplace and at VET-school is essential for learners' vocational development (Bakker et al., 2012; Schaap et al., 2011) in terms of satisfaction, reduced risk for resignation, and commitment (Stalder & Carigiet Reinhard, 2014; Stalder & Lüthi, in press.; Stalder & Schmid, 2016).

4 Conclusion

The goal of this study was to find distinct profiles of situational resources and demands at the workplace and at school, to explore how these resources profiles and CSE are related to learning opportunities, and how learning opportunities, in turn, affect career-outcomes of learners in the following year. We found four homogenous latent resource profiles, which are characterised by different patterns and levels of work- and school-related resources. The unique feature of these resources profiles is that workplaces and school, which are both seen as valid learning places

(Messmann & Mulder, 2015), were considered. The profiles of work- and school-resources are closely linked to apprentices' learning opportunities within the specific learning environments, with the interesting result, that lacking resources might be more critical regarding (missing) learning opportunities than having good resources. On a general level, our results enhance our understanding of how situational and individual resources at work and at school are related to learning opportunities and work-related career outcomes. They provide insights about the necessity of high learning opportunities for positive career development (Deci & Ryan, 2000; Kyndt & Baert, 2013).

Our study has some limitations that should be considered in future research. First, we relied on a sample of apprentices from Switzerland and generalizability to other countries might be limited. Future research can fill this gap by replicating our findings with samples from different VET-systems. It would be helpful to provide knowledge about resource profiles in school-based VET-systems, which include shorter internships. Second, we relied on self-report measures, and shared method bias might have affected the observed relationships between the applied measures (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). A third limitation is that affectivity, an indicator used to build CSE, was only assessed in the second TREE-wave. We could therefore not examine resources in the first year of the apprenticeship, which may have led to yet other different resource profiles. Further analysis could explore situational and individual resources at the beginning of VET and analyse their association with the development of learning opportunities during the whole apprenticeship after the transition to qualified employment. Research has shown that early career experiences profoundly affect career development, and we assume that having high resources at the workplace and school will be associated with successful careers.

References

- Akkerman, S. F., & Bakker, A. (2012). Crossing boundaries between school and work during apprenticeships. *Vocations and Learning*, 5(2), 153–173. doi:10.1007/s12186-011-9073-6
- Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: State of the art. *Journal of Managerial Psychology*, 22(3), 309–328. doi:10.1108/02683940710733115
- Bakker, A. B., Demerouti, E., & Ten Brummelhuis, L. L. (2012). Work engagement, performance, and active learning: The role of conscientiousness. *Journal of Vocational Behavior*, 80(2), 555–564. doi:10.1016/j.jvb.2011.08.008
- Billett, S. (2001). Learning through work: Workplace affordances and individual engagement. *Journal of Workplace Learning*, 13(5), 209–214.
- Bruggemann, A., Groskurth, P., & Ulich, E. (1975). *Arbeitszufriedenheit*. Bern: Hans Huber.
- Coetzer, A. (2007). Employee perceptions of their workplaces as learning environments. *Journal of Workplace Learning*, 19(7), 417–434. doi:10.1108/13665620710819375
- Collins, A. (2006). Cognitive apprenticeship. In R. K. Sawyer (Ed.), *The Cambridge handbook of the learning sciences* (pp. 47–60). Cambridge: Cambridge University Press.
- De Witte, H., Verhofstadt, E., & Omey, E. (2007). Testing Karasek's learning and strain hypotheses on young workers in their first job. *Work & Stress*, 21(2), 131–141. doi:10.1080/02678370701405866
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. doi:10.1207/s15327965pli1104_01
- Demerouti, E., & Bakker, A. B. (2011). The job demands–resources model: Challenges for future research. *SA Journal of Industrial Psychology*, 37(2), 1–9. doi:10.4102/sajip.v37i2.974

- Dormann, C., Fay, D., Zapf, D., & Frese, M. (2006). A state-trait analysis of job satisfaction: On the effect of core self-evaluations. *Applied Psychology: An International Review*, *55*(1), 27–51. doi:10.1111/j.1464-0597.2006.00227.x
- Elfering, A., Keller, A. C., Berset, M., Meier, L. L., Grebner, S., Kälin, W., . . . Semmer, N. K. (2016). Taking the chance: Core self-evaluations predict relative gain in job resources following turnover. *Springerplus*, *5*(1702), 1–10. doi:10.1186/s40064-016-3365-0
- Elfering, A., Semmer, N. K., Tschan, F., Kälin, W., & Bucher, A. (2007). First years in job: A three-wave analysis of work experience. *Journal of vocational behavior*, *70*(1), 97–115. doi:10.1016/j.jvb.2006.07.001
- Eye, A. v., & Bogat, G. A. (2006). Person-oriented and variable-oriented research: Concepts, results, and development. *Merrill-Palmer Quarterly*, *52*(3), 390–420. doi:10.1353/mpq.2006.0032
- Filliettaz, L. (2012). Interactions tutorales et formation des formateurs. *Travail et Apprentissages*, *9*(june 2012), 62–83.
- Fuller, A., & Unwin, L. (2003). Learning as apprentices in the contemporary UK workplace: Creating and managing expansive and restrictive participation. *Journal of Education and Work*, *16*(4), 407–426. doi:10.1080/1363908032000093012
- Geiser, C. (2011). *Datenanalyse mit Mplus. Eine anwendungsorientierte Einführung* (second Ed.). Wiesbaden: VS Verlag für Sozialwissenschaften.
- Hackman, J. R. (1980). Work redesign and motivation. *Professional Psychology*, *11*, 445–455. doi:10.1037/0735-7028.11.3.445
- Hu, L.-t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55. doi:10.1080/10705519909540118
- Judge, T. A., & Bono, J. E. (2001). A rose by any other name: Are self-esteem, generalized self-efficacy, neuroticism, and locus of control indicators of a common construct? In B. W. Roberts & R. Hogan (Eds.), *Personality psychology in the workplace. Decade of behavior* (pp. 93–118). Washington, DC: American Psychological Association.
- Judge, T. A., Bono, J. E., & Locke, E. A. (2000). Personality and job satisfaction: The mediating role of job characteristics. *Journal of Applied Psychology*, *85*(2), 237–249.
- Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2003). The core self-evaluation scale: Development of a measure. *Personnel Psychology*, *56*(2), 303–331. doi:10.1111/j.1744-6570.2003.tb00152.x
- Judge, T. A., Heller, D., & Klinger, R. (2008). The dispositional sources of job satisfaction: A comparative test. *Applied Psychology*, *57*(3), 361–372. doi:10.1111/j.1464-0597.2007.00318.x
- Judge, T. A., & Hurst, C. (2007). The benefits and possible costs of positive core self-evaluations: A review and agenda for future research. In D. Nelson & C. L. Cooper (Eds.), *Positive organizational behavior* (pp. 159–174). London, UK: Sage Publications.
- Judge, T. A., Locke, E. A., Durham, C. C., & Kluger, A. (1998). Dispositional effects on job and life satisfaction: The role of core evaluations. *Journal of Applied Psychology*, *83*(1), 17–34. doi:10.1037/0021-9010.83.1.17
- Keller, A. C., & Semmer, N. K. (2013). Changes in situational and dispositional factors as predictors of job satisfaction. *Journal of vocational behavior*, *83*(1), 88–98. doi:10.1016/j.jvb.2013.03.004
- Klotz, V. K., Billett, S., & Winther, E. (2014). Promoting workforce excellence: Formation and relevance of vocational identity for vocational educational training. *Empirical Research in Vocational Education and Training*, *6*. Retrieved from <http://www.ervet-journal.com/content/6/1/6> doi:10.1186/s40461-014-0006-0

- Kyndt, E., & Baert, H. (2013). Antecedents of employees' involvement in work-related learning. *Review of Educational Research*, 83(2), 273–313. doi:10.3102/0034654313478021
- Lee, K., Carswell, J., & Allen, N. J. (2000). A meta-analysis review of occupational commitment: Relations with person- and work-related variables. *Journal of Applied Psychology*, 85(5), 799–811.
- Lo, Y., Mendell, N. R., & Ruben, D. B. (2001). Testing the number of components in a normal mixture. *Biometrika*, 88(3), 767–778. doi:10.1080/01621459.2014.986272
- Messmann, G., & Mulder, R. H. (2015). Conditions for apprentices' learning activities at work. *Journal of Vocational Education & Training*, 67(4), 578–596. doi:10.1080/13636820.2015.1094745
- Mulder, R. H., Messmann, G., & König, C. (2015). Vocational education and training: Re-searching the relationship between school and work. *European Journal of Education*, 50(4), 497–512. doi:10.1111/ejed.12147
- Muthén, L. K., & Muthén, B. O. (1998-2017). *Mplus user's guide* (8th ed.). Los Angeles, CA: Muthén & Muthén.
- Nägele, C. (2013). Correlates and predictors of apprentices' perception of their workplace as learning place. An analysis of the first three years in apprenticeship. In S. Akoojee, P. Gonon, U. Hauschildt, & C. Hofmann (Eds.), *Apprenticeship in a globalised world. Premises, promises and pitfalls* (pp. 95–98). Münster: LIT Verlag.
- Nikolova, I., Van Ruysseveldt, J., De Witte, H., & Syroit, J. (2014). Work-based learning: Development and validation of a scale measuring the learning potential of the workplace (LPW). *Journal of vocational behavior*, 84(1), 1–10. doi:10.1016/j.jvb.2013.09.004
- Nore, H. (2015). Re-contextualizing vocational didactics in Norwegian vocational education and training. *International journal for research in vocational education and training*, 2(3), 182–194. doi:10.13152/IJRVET.2.3.4
- Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling: A Multidisciplinary Journal*, 14(4), 535–569. doi:10.1080/10705510701575396
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. doi:10.1037/0021-9010.88.5.879
- Prümper, J., Hartmannsgruber, K., & Frese, M. (1995). KFZA. Kurzfragebogen zur Arbeitsanalyse. *Zeitschrift für Arbeits- und Organisationspsychologie*, 39(3), 125–131.
- Raemdonck, I., Gijbels, D., & van Groen, W. (2014). The influence of job characteristics and self-directed learning orientation on workplace learning. *International Journal of Training and Development*, 18(3), 188–203. doi:10.1111/ijtd.12028
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78.
- Schaap, H., Baartman, L., & de Bruijn, E. (2011). Students' learning processes during school-based learning and workplace learning in vocational education: A review. *Vocations and Learning*, 5(2), 99–117. doi:10.1007/s12186-011-9069-2
- Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin*, 124(2), 262–274.
- Schwartz, G. (1978). Estimating the dimension of a model. *The Annals of Statistics*, 6(2), 461–464. doi:10.1016/0167-2789(94)90008-6
- Shimazu, A., Shimazu, M., & Odahara, T. (2004). Job control and social support as coping resources in job satisfaction. *Psychological Reports*, 94(2), 449–456. doi:10.2466/PR.94.2.449-456

- Stalder, B. E. (2003). *Wege in die nachobligatorische Ausbildung. Die ersten zwei Jahre nach Austritt aus der obligatorischen Schule. Zwischenergebnisse des Jugendlängsschnitts TREE Schule, Arbeit, Ausbildungszufriedenheit. Reihe "Bildungsmonitoring Schweiz"*. Neuchâtel: Bundesamt für Statistik.
- Stalder, B. E., & Carigiet Reinhard, T. (2014). Ausbildungsqualität aus Sicht von Lernenden und Betrieben in der Schweiz. In M. Fischer (Ed.), *Qualität in der Berufsausbildung – Anspruch und Wirklichkeit* (pp. 97–118). Bielefeld: Bertelsmann.
- Stalder, B. E., & Lüthi, F. (in press). Learning within and beyond the borders of schools and workplaces. Proceedings of the *VI Stockholm International Conference & Research Workshop on Vocational Education & Training: Voices from Research*, May 2018, Stockholm, Sweden.
- Stalder, B. E., Meyer, T., & Hupka-Brunner, S. (2011). TREE Project Documentation. Das Projekt TREE: Eine Übersicht. In M. M. Bergman, S. Hupka, A. C. Keller, T. Meyer, & B. E. Stalder (Eds.), *Youth transitions in Switzerland: Results from the TREE panel study* (pp. 66–87). Zürich: Seismo.
- Stalder, B. E., & Nägele, C. (2011). Vocational education and training in Switzerland: Organisation, development and challenges for the future. In M. M. Bergman, S. Hupka-Brunner, A. Keller, T. Meyer, & B. E. Stalder (Eds.), *Youth transitions in Switzerland: Results from the TREE panel study* (pp. 18-39). Zürich: Seismo.
- Stalder, B. E., & Schmid, E. (2016). *Lehrvertragsauflösung und Ausbildungserfolg - kein Widerspruch*. Bern: hep.
- Taris, T. W., & Feij, J. A. (2004). Learning and strain among newcomers: A three-wave study on the effects of job demands and job control. *The Journal of Psychology*, 138(6), 543–563. doi:10.3200/JRLP.138.6.543-563
- Taris, T. W., & Kompier, M. A. J. (2014). Cause and effect: Optimizing the designs of longitudinal studies in occupational health psychology. *Work & Stress*, 28(1), 1–8. doi:10.1080/02678373.2014.878494
- Warr, P., & Inceoglu, I. (2012). Job engagement, job satisfaction, and contrasting associations with person-job fit. *Journal of Occupational Health Psychology*, 17(2), 129–138. doi:10.1037/a0026859
- Wu, C.-H., & Griffin, M. A. (2012). Longitudinal relationships between core self-evaluations and job satisfaction. *Journal of Applied Psychology*, 97(2), 331–342. doi:10.1037/a0025673
- Zimmerman, B. J., & Kitsantas, A. (2005). The hidden dimension of personal competence: Self-regulated learning and practice. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 509–526). New York: The Guilford Press.

Biographical notes

Fabienne Lüthi is a PhD student at the Institute of Upper Secondary Education at the University of Teacher Education Bern, Switzerland. Her research interests focus on individual resources and learning, career development and success.

Dr **Barbara E. Stalder** is a Professor at the Institute of Upper Secondary Education at the University of Teacher Education Bern, Switzerland. Her research interests focus on student engagement and learning, career development in VET and career success over the life-course.