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Support from teachers and trainers in Vocational education and training: The pathways to career aspirations and further career development

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Abstract: Transition from school to work is a challenging period for young people with learning difficulties. In the dual vocational system of Switzerland, teachers at vocational educational and training (VET)-schools, as well as trainers at VET-companies, provide important support. We were interested in the different pathways from this support to apprentice's career aspirations and further training. Structural equation modelling was used to analyse data from a longitudinal study in four occupational sectors. Results show that VET-teacher support is directly and indirectly related to career aspirations at the end of the apprenticeship, whereas VET-trainer support influences career aspirations only indirectly. Domain specific constructs (ability self-concept at VET-school, skill variety at the VET-company) and self-esteem are important as intermediary variables. Ability self-concept at VET-school had a strong influence on further education three years after the apprenticeship.

Keywords: School-to-work transition, special educational needs, learning difficulties, social support, vocational education and training, longitudinal study

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1 Introduction

The transition from school to work is one of the major developmental tasks for young adults; it also has important consequences for further career development (Grob and Jaschinski, 2003; Nurmi, Salmela-Aro and Koivisto, 2002). The Swiss educational policy states that by 2015, 95% of all young adults should complete a post-compulsory education qualification at the upper secondary level. With 93% in 2011, this target has almost been met¹.

A successful transition from school to work is a particular challenge for young people with learning difficulties, because they may face difficulties finding a suitable apprenticeship, fulfilling requirements at the vocational education and training (VET)-school and as finding employment after the apprenticeship (Felkendorf and Lischer, 2005; Häfeli and Schellenberg, 2009; Heinz, 2002; Hupka, Sacchi and Stalder, 2006; Neuenschwander and Grunder, 2010; OECD, 2000). It is therefore important to study factors that facilitate transition from school to work for this population.

In 2004, Switzerland introduced an adapted training program as part of the dual system to help young adults with learning difficulties to complete a post-compulsory qualification (Kammermann, 2010; Kammermann, Amos, Hofmann and Hättich, 2009; Kammermann, Stalder and Hättich, 2011). This two-year program for young people with more practical skills combines part-time classroom instructions with part-time apprenticeship in a VET-company as regular VET-programs do (Stalder and Nägele, 2011). In addition, apprentices are eligible for additional support from VET-schools, and VET-schools and VET-companies cooperate closely. Additional support includes learning support and support if personal problems or conflicts in the VET-company arise. A goal of this training program is to assure successful graduation – apprentices obtain a recognised qualification for a specific occupational profile. Specific goals of this program are to increase employability and also permeability for further training and career development (e.g. the Federal VET diploma).

It is generally assumed that career-related social support (i.e., advice, emotional support or instrumental help) is important for young adults that have to cope with the demands of a transition at work. Career-related social support improves self-regulation capacities and lowers career concerns (Creed, Fallon and Hood, 2009). Career-related social support helps apprentices to develop competences (Neuenschwander, Frey and Gasser, 2007), increase persistence (Hackett, Betz, Casas and Rocha-Singh, 1992), enhance perceived abilities (Rice, Barth, Guadagno, Smith and McCallum, 2013) and increase performance (Day and Allen, 2004). It thus leads to more positive career outcomes. Although the effects of career-related social support have been demonstrated for a general population, the question remains how social support at school or at work during apprenticeship influences career development and career success in a population with learning difficulties.

The general aim of this study is to better understand – for apprentices participating in the above mentioned adapted two-year program – how support provided by VET-teachers and by VET-trainers influences short- and long-term career aspirations. We define career aspirations as (positive) thoughts about the

¹ Compared to the 82.2% average of Organisation for Economic Co-operation and Development (OECD) members, this rate is high (OECD 2013).

future self in work environments or career situations. Career aspirations are important concepts in view of an ambitious career goal, because career aspirations focus one's resources on a particular task (Nurmi et al., 2002) and motivate behaviours related to the realization of preferred outcomes (Abele and Spurk, 2009; Beal and Crocket, 2010; Lent, Brown and Hackett, 2000). This is especially important for young people with learning difficulties, because they are more likely to encounter barriers, and thus have to make a greater effort to achieve professional goals.

More specifically, we contend that the two VET-learning environments in the dual system (VET-school and VET-company), each have specific demands, but also offer specific support (Thoits, 2011). We thus assume that the support given by VET-teachers at school and VET-trainers in the company influence career aspirations and career development through different intermediary paths: At VET-school, teachers provide support by supervising, encouraging and guiding the learning process. This likely helps to enhance the apprentice's school-related ability self-concept. At the VET-company, priorities are different: Apprentices develop competences based on work experiences, apply their competences and learn by doing. We thus expect that VET-trainers support apprentices by (inter alia) assigning them appropriate and varying tasks. In line with other studies (e.g., Linneham 2003), we further expect that self-esteem is an important link between experienced support, career aspirations and further education.

2 Theoretical background

2.1 Social support, intermediary paths and career aspirations

Social support is defined as 'a flow of emotional concern, instrumental aid, information, and/or appraisal between people' (House, 1981, p. 26) and is supposed to be helpful by satisfying senses of belonging, building up individual patterns of orientation and action to cope in a complex environment and by 'buffering' the negative effects of stress on well-being and mental health (Cohen and Wills, 1985; House, 1981; Laireiter, 1993), on work-related outcomes, e.g. work-satisfaction (e.g., Harris, 2007) or educational attainment (e.g., Diemer, 2007).

VET-situations typically evoke needs on different support dimensions: (i) emotional support (e.g., expressing esteem, providing comfort and encouragement after setbacks) (ii) cognitive/informational support (e.g., providing career-specific information, giving advice), and (iii) instrumental/behavioural support (e.g., active coping assistance, supervising and assigning tasks). Supervisors are important as supporters because they have experience with similar situations (Thoits, 2011).

Support is most effective when there is a 'triple match' between demands, resources (e.g., support) and individual outcome, meaning that qualitatively similar dimensions are affected (Chrisopoulos, Dollard, Winefield and Dormann, 2010). This means for example that an apprentice who is confronted with an emotionally demanding situation can be helped most effectively by emotional support to prevent a negative emotional reaction (e.g., getting depressed).

In the current study, the apprentices with learning difficulties have two supervisors that are potential sources of social support: Teachers at VET-school and trainers at the VET-company. As VET-teachers and VET-trainers represent different systems with specific demands, conditions and limitations (Lent et al.,

2000; Neuenschwander, Gerber, Frank and Rottermann, 2012), we expect – beside some similarities in the support provided – differences in the support provided:

(1) As for the similarities, VET-teachers and VET-trainers may both be an important source of *emotional* support. Emotional support of both supervisors may influence self-evaluations and self-esteem. Acceptance by supervisors influences self-esteem of subordinates (Day and Allen, 2004); supervisor support indicates to employees that they are valued and have career potential, which elicits positive affective reactions (Ng, Eby, Sorensen and Feldman, 2005). It has also been shown that support during apprenticeship (i.a., from supervisors, teachers but also from parents) leads to higher self-esteem (Linnehan, 2003; Vignoli, 2009), less self-devaluation (Neuenschwander et al., 2007) and fewer career concerns (Creed et al., 2009). Self-esteem in turn might have consequences on other relevant dimensions such as career aspirations (see Nurmi et al., 2002).

However, there are also differences between support received at school and at work.

(2) At VET-school, the requirements challenge the apprentices with learning difficulties mainly on the *cognitive* dimension. We suppose that VET-teachers can help to (re)interpret school success/failure experiences. In doing this, they may influence the apprentice's view of his/her abilities at school and thus, their long term career aspirations. Social cognitive career theorists argue that social support influences outcomes such as career choices *directly*, but also *indirectly* via learning experiences and self-efficacy beliefs (Lent et al., 2000). Some studies found direct effects of school support on career aspirations and development (e.g., Diemer, 2007), but most empirical studies supported models with self-efficacy as a mediator between support and outcomes (Lent et al., 2001; Lent et al., 2003; Linnehan, 2003; Pan, Sun and Hau Siu Chow, 2011; Pinguart, Juang and Silberstein, 2003; Restubog, Florentino and Garcia, 2010). Furthermore, teacher support was found to influence perceived abilities at school (Rice et al., 2013).

In accordance with social cognitive career theory (Lent et al., 2000), we contend that in the VET-school context, the ability self-concept at school is an appropriate domain-specific analogue for self-efficacy. Ability self-concept at school is defined as the apprentice's conception of his/her own ability to learn and succeed at VET-school. We further argue that the ability self-concept at school shapes expectations about potential future vocational pathways (effort required, probability of success or failure). It is therefore an important influence on career aspirations at the end of the apprenticeship (see Nurmi et al., 2002).

Based on the above considerations, we formulate the following hypotheses for VET-teacher support:

VET-teacher support directly influences career aspirations at the end of the apprenticeship (t1) (H1a). We also expect that the influence of VET teacher support on t1 career aspirations is partially mediated by t1 ability self-concept at VET-school and by t1 self-esteem (H1b).

(3) In VET-companies, requirements differ from requirements at school. In a company, apprentices are part of a productive team and have to learn how to fulfil their tasks efficiently (Singer, Gerber and Neuenschwander, 2013). Apprentices are expected to slowly grow from the role of a novice into that of an expert worker (Stalder and Nägele, 2011). The VET-trainer at the company is an important source of support in this context. Compared to the VET-teacher, the VET-trainer support may be available more often, because apprentices in the two year program stay four days per week at the VET-company and one day at VET-school.

We contend that an important source of *instrumental* support at a VET-company is provided by assigning interesting and varying tasks (high skill variety) to the apprentices and thus creating situations at work where apprentices have to behave and act as professionals. As work in the company is less structured and regulated than learning in VET-school (Neuenschwander et al., 2012), different companies may offer different opportunities to learn on the job. Assigning tasks that require using high skill variety enhances motivation (Hackman, 1980) and encourages apprentices to develop and use different competences. Assigning motivating tasks signals appreciation (Semmer and Beehr, 2014) and indicates that a person is seen as capable and competent which increases self-efficacy (Day and Allen, 2004). High skill variety tasks have a positive influence on self-esteem (Beal and Crocket, 2010), increase intrinsic learning motivation (Berweger, Krattenmacher, Salzmann and Schönenberger, 2013) and are related with more satisfaction and successful transition to the labour market for apprentices, whereas skill variety at VET-school did not have that effect (Stalder, 2012).

Practical activities, the possibility to explore and skill variety are assumed to be especially important for apprentices with learning difficulties in their career choice (Schellenberg and Hofmann, 2013), as performance-related feedback in such situations (e.g., by VET-trainers in the company) leads to an adjustment of future expectations and in this way influences future-oriented cognitions respectively career aspirations (Beal and Crocket, 2010).

Based on the above considerations, we formulate the following hypotheses for VET-trainer support:

VET-trainer support influences t1 career aspirations directly (H2a). We further expect that VET-trainer support influence on t1 career aspirations is partially mediated by t1 skill variety at the VET-company and by t1 self-esteem (H2b).

2.2 Longitudinal effects of social support on later career development

Many studies investigated support effects using cross-sectional research designs. There are some exceptions: Diemer (2007) examined the longitudinal impact of instrumental school support on vocational expectations two years later, but this effect turned out to be not significant. Another study (Restubog et al., 2010) found that students who received more counselling sessions at school had greater career self-efficacy and were more positive about their career decisions six months later. In addition, they less often changed their academic program 18 months later. Lent et al. (2003) found that support's influence on persistence was indirect via self-efficacy, interests and goals. In a meta-analysis (Ng et al., 2005), supervisor support predicted later career success, whereby effect sizes for subjective success were generally stronger (average correlation=.31) than those for objective career success (.10 resp.13).

We are interested in investigating whether support during apprenticeship influences young adults to undertake efforts for further training. This is an important question, because an additional certificate (e.g., a federal VET diploma) is a better base for future career development than a certificate of the two-year VET-program. Career aspirations are assumed to be important in this situation, because, especially for young people with learning difficulties, it might not be very attractive from a short-term perspective to make the effort and bear the costs of longer training (Maier and Brunstein, 2001; Nurmi et al., 2002). Nevertheless, we suppose that the influence of previous support is limited and indirect if we consider

more ‘objective’ measures of career success (as, e.g., undertaking further education or not).

Based on the above considerations, we formulate the following hypotheses for longitudinal effects of VET-support:

VET-teacher and VET-trainer support at t1 influences career aspirations at t2 (three years later) indirectly via t1 career aspirations and t1 and t2 self-esteem (H3) and VET-trainer support at t1 influences career aspirations at t2 indirectly via t1 career aspirations and t1 and t2 self-esteem (H4).

Effects of support from VET-teachers and VET-trainers on undertaking further education (vs. not) are indirect via t1 and t2 career aspirations (H5a). Furthermore, ability self-concept at VET-school at t1 is a predictor for undertaking further education (H5b).

2.3 Model

Fig. 1 summarises the different pathways from VET-teacher and VET-trainer support to t1 career aspirations and to t2 career aspiration and t2 undertaking further education. VET-teacher support is supposed to influence t1 career aspirations directly (H1a) and indirectly via t1 ability self-concept at school and self-esteem (H1b). VET-trainers support is supposed to influence t1 career aspirations directly (H2a) and indirectly via skill-variety at the VET-company and self-esteem (H2b). We further hypothesise indirect longitudinal effects of VET-teacher and VET-trainer support on t2 career aspirations via t1 career aspirations and t1 and t2 self-esteem (H3 and H4) and on further education (H5a). Additionally, we expect that t1 ability self-concept at school influences the probability of undertaking a further education after apprenticeship (H5b).

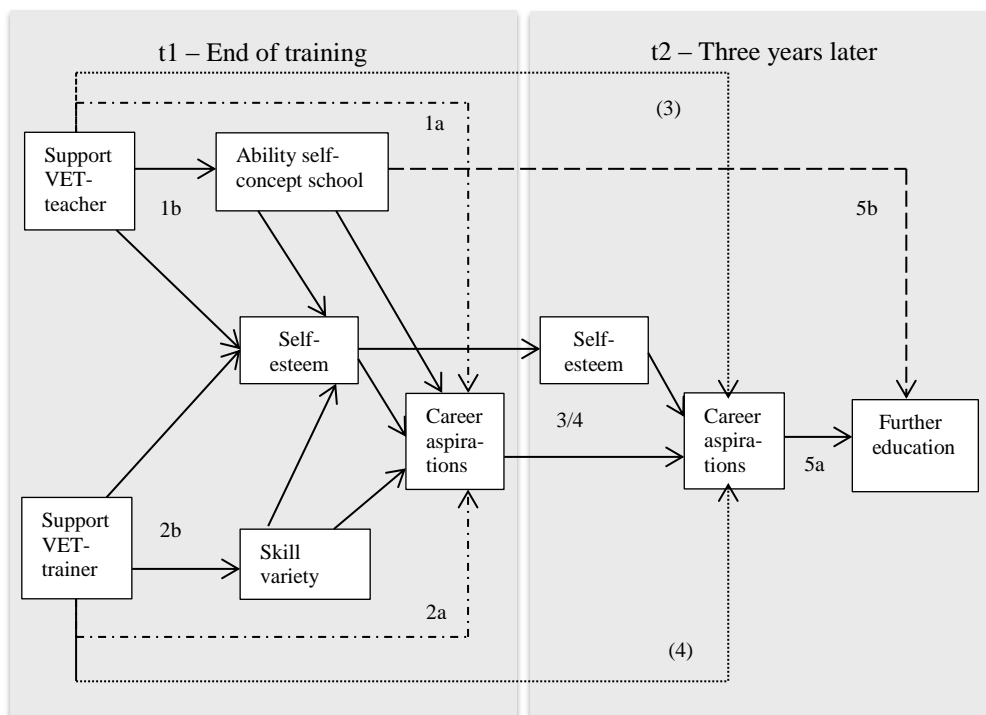


Figure 1: Hypothesised influences of social support on career aspirations/situation at the end of the training and three years later

3 Method

3.1 Participants and procedure

Participants were 525 young adults (Mean age 19.7 years at t1; SD=2.1 years; 62.5% females) who responded to a written survey at the end of their two-year vocational training (t1) and three years later (t2). More than half of the participants (57.1%) had at least one parent not born in Switzerland. Before entering vocational training, 22.1% had attended special classes or schools for pupils with learning difficulties.

At t1, 185 participants (35.2%) worked in sales; 134 (25.5%) in gastronomy, 106 (20.2%) in home economics, and 100 (19.1%) in joinery.

The first (t1) survey was administered in a classroom setting either in June 2007 (319 participants) or in June 2009 (206 participants). Researchers were present to answer questions. The response rate at t1 was 100%. Three years later (t2), participants were contacted by phone and interviewed using a semi-structured questionnaire. Response rate was 51.1% (n=268).

The analysis of missing data shows no significant systematic dropouts regarding gender, former school career, migration background or sectors. Furthermore, there is no significant difference between drop-outs and people taking part at both measurement time-points regarding the t1 constructs in our model (VET-teacher support, VET-trainer support, self-esteem, skill variety, ability self-concept VET-school, career aspirations).

3.2 Measures

3.2.1 Social support from VET-teachers and VET-trainers

Social support from teachers at the VET-school and trainers at the VET-company was measured at t1 with two items each, based on the social support scale developed by Frese (1999) that was adapted by the TREE panel study (Stalder, Meyer and Hupka-Brunner, 2011) The introductory questions were: (1) 'How interested are the following persons in your training situation?' and (2) 'How much can you rely on the following persons if the vocational training situation gets difficult?', each followed by a list of possible supporters (i.a., VET-teacher, VET-trainer). The answer format was a 4-point Likert scale, ranging from 'not at all' (=1) to 'very' (=4). Cronbach- α for teacher's support at VET-school was .83 (r=.62); for VET-trainer's support at the VET-company, Cronbach- α was .76 (r=.72).

3.2.2 Ability self-concept at VET-school

To measure the ability self-concept for VET-school performance, we developed a two-item scale measuring self-perceived performance at VET-school. The two items were 'How do you assess your performance in occupation-specific knowledge classes?' and 'How do you assess your performance in general subjects classes?' The answer format was a 5-point Likert scale, ranging from 'bad' (=1) to 'good' (=5); Cronbach- α for this scale was .78 (r=.63).

3.2.3 Skill variety

Skill variety was measured at t1 with a scale developed by Prümper, Hartmannsgruber and Frese (1995). The items were: 'At work I can learn a lot of new

things', 'My work is varied' and 'At work I can use my knowledge and my skills fully'. The answer format was a 5-point-scale ranging from 'very rarely/never' (=1), to, 'very often' (=5). Cronbach's α of this scale was .75.

3.2.4 Self-esteem

Self-esteem was measured at t1 and t2 with a scale based on Rosenberg (1979). Four items were selected: 'On the whole, I am satisfied with myself', 'I feel that I have a number of good qualities', 'I am able to do things as well as most other people' and 'I feel that I'm a person of worth, at least on an equal plane with others'. The answer format was a 4-point-scale ranging from 'not at all true' (=1) to 'totally true' (=5). Cronbach's α of the scale was .72 at t1 and .59 at t2².

3.2.5 Career aspirations

To measure career aspirations, we used three items from a scale developed by Watermann (2000). At t1 and t2, the apprentices were asked as follows: 'If you think about your future: What is important for you?' Selected items were: 'Having a work-situation where I can always learn something new', 'Having a work-situation where I can use my skills fully' or 'Having a job that offers me good possibilities for further education'. The answer format was a 4-point Likert scale ranging from 'not at all important' (=1), to 'very important' (=4). Cronbach's α for the scale was .65 at t1 and .60 at t2³.

3.2.6 Undertaking further education

At t2, the young workers described their actual professional situation by selecting one of ten options (e.g., working in their learned occupation, undertaking further education for a federal VET-certificate or another further education, unemployed, etc.). Answers were coded 0=not undertaking further education and 1=undertaking further education. In sum, 81 out of 268 persons (30.2%) were undertaking further education or had already finished it at t2.

4 Results

4.1 Descriptive statistics and measurement model

Means, standard deviations and bivariate correlations between all included variables are presented in Table 1.

² Cronbach- α for self-esteem for t2 is rather low probably because at t1 we provided support in the classroom and at t2 we did interviews by telephone.

³ Cronbach- α for career aspirations is rather low probably because it is not an existing scale (some items were used from a scale measuring 'intrinsic work values') and the survey situation was different (see footnote 2).

Table 1: Descriptive statistics and bivariate correlations of the involved scales

	N	M	SD	1	2	3	4	5	6	7	8
1 t1 STE	494	3.22	.83	-							
2 t1 STR	501	3.33	.86	.43**	-						
3 t1 SEL	517	3.95	.63	.15**	.19**	-					
4 t1 ASC	524	3.81	.71	.15**	.09	.30**	-				
5 t1 SVA	523	3.87	.75	.14**	.40**	.35**	.22**	-			
6 t1 CAS	516	3.34	.53	.26**	.22**	.36**	.24**	.25**	-		
7 t2 SEL	265	4.36	.50	.07	.11	.26**	.09	.15*	.16**	-	
8 t2 CAS	266	3.61	.43	.00	.10	.00	-.02	.00	.06	.22**	-
9 t2 FE ¹	268	.30	-	.05	.10	.04	.20**	.01	.10	.07	.12 [†]

Notes. [†] $p > .10$, * $p < .05$, ** $p < .01$, *** $p < .001$, STE=Support VET-Teacher, STR=Support VET-Trainer, ASC=Ability self-concept, SVA=Skill variety, SEL=Self-esteem, CAS=Career aspirations, FE=Further education, ¹Spearman's rank correlation coefficient

To examine the hypothesised relationships (Fig. 1), a two-step procedure was undertaken using MPlus: First, we estimated a measurement model to test the discriminant validity of the involved constructs (Muthén and Muthén, 2012). In a second step, we tested and compared several structural models with direct and mediated paths.

In the measurement model, each construct was represented by a latent factor which was allowed to correlate with the others. We used a rescaling-based robust estimator MLR in MPlus as recommended by Wang and Wang (2012) to deal with skewness and kurtosis in our data and obtain robust estimates. Measurement errors of the repeated measures at t1 and t2 (self-esteem, career aspirations) were allowed to correlate as recommended for autoregressive models (Christ and Schlüter, 2012). To assess the adequacy of the measurement model, we refer to the comparative fit index (CFI), Tucker-Lewis index (TLI) and the root-mean-square error of approximation (RMSEA). CFI and TLI values greater than or equal to .95 and RMSEA lower than .05 suggests 'good fit' of a model (Wang and Wang, 2012). We tested measurement invariance for the repeated measures (self-esteem, career aspirations). Results of this separate analysis showed strong measurement invariance for both concepts⁴.

To deal with missing data, a Full Maximum Likelihood method (FIML) approach is used. It uses all the information of the observed data and maximises the likelihood of the model given the observed data (Wang and Wang, 2012). In the situation of missing at random (as our drop-out analysis shows we have), FIML is more efficient and less biased than traditional approaches (Peugh and Enderssen, 2004). This is especially important for longitudinal analyses with severe panel mortality, as is the case in this study.

⁴ This means that setting loadings and means equal at t1 and t2 did not significantly worsen the model fit, measured with a Chi²-Difference Test as recommended by Christ and Schlüter (2012).

4.2 Measurement model

Results of this first step showed that all indicators significantly loaded on their specified latent construct, most of them with high factor loadings. This provides psychometric support for the selected items and their respective scale. Model fit indices were CFI=.930, TLI=.915 and RMSEA=.037 at first. Modification indices point to shared measurement errors, probably caused by similar wordings for the support items (Byrne, 2010; Diemer, 2007). We therefore allowed two of these errors to correlate⁵. The final measurement model showed good fit indices (CFI=.952, TLI=.942, RMSEA=.031).

4.3 Structural model: Pathways from social support to career aspirations

To test our hypotheses (Fig. 1) and decide whether paths are only indirect or direct (fully or partially mediated models), we evaluated different nested models by comparing their goodness of fit indices with a Chi-Square Difference-Test (see Restubog et al., 2010). The basic idea is that we accept the partially mediated model for reasons of parsimony only if the resulting Chi-Square Difference is significant, meaning that the additional direct path improved the fit significantly compared to the fully mediated model.

We started with a fully mediated Model A and specified the different indirect paths⁶ (see Table 2 for fit indices and path coefficients). For Model B, we added two direct paths from t1 teacher support to t1 career aspirations (H1a) and from t1 VET-trainer support to t1 career aspiration (H2a). A comparison of Model A and B showed a significant better fit for Model B (Δ MLR=12.57, $df=2$, $p=.002$). Thus, our results support the partially mediated Model B. The fit statistics for this model were good (CFI=.965, TLI=.955, RMSEA=.036).

Next we included t2 and first added t2 self-esteem and t2 career aspirations (using our final t1-Model B as a base). We again tested the two models against each other: For Model C, we assumed that effects of t1 support (VET-teachers and VET-trainers) on t2 career aspirations are only indirect via t1 variables and t2 self-esteem (H3, H4).

For the competitive Model D, we added two additional direct paths from t1 VET-teacher support and t1 VET-trainer support to t2 career aspirations. Comparison of the two models C and D showed that the partially mediated model D was not significantly better than the fully mediated model C (Δ MLR=1.972 $df=2$, $p=0.373$). Therefore, we can conclude that the parsimonious full mediation model is preferable. The fit statistics for model C were good (CFI=.947, TLI=.941, RMSEA=.031).

⁵ Errors between VET-teacher support 'interest in training situation' (see 3.2.1.) and VET-trainer support 'interest in training situations' and between VET-teacher support 'difficult training situations' and VET-trainer support 'difficult training situations' were allowed to correlate.

⁶ The interrelations between t1 VET-teacher and VET-trainer support, t1 ability self-concept at VET-school, t1 skill variety, t1 self-esteem and t1 career aspirations were assessed separately with similar comparative analyses. It turned out that there are no direct effects from VET-teacher or VET-trainer support on t1 self-esteem but only indirect paths via ability self-concept resp. skill variety. Furthermore, there were no direct paths from t1 ability self-concept and from t1 skill variety to t1 career aspirations, but self-esteem fully mediated these relations (see Fig. 2).

Lastly, we included ‘undertaking further education’ in the Model E⁷ and specified a path from t2 career aspirations to t2 further education (H5a) and a path from t1 ability self-concept at VET-school to t2 further education (H5b). The final Model E has acceptable fit statistics (CFI=.932, TLI=.923, RMSEA=.031).

Fit indices and path coefficients (direct and indirect paths) for each of the five models A–E are presented in Table 2:

Table 2: Direct and indirect paths from t1 VET-trainer support and t1 VET-teacher support to t1/t2 career aspirations and t2 further education (N=525)

Fit Indices and paths	Model A Full med. t1	Model B Part. med. t1	Model C Full med. t2	Model D Part. med. t2	Model E + further education
χ^2	173.49	158.63	337.57	335.74	359.04
DF	96	94	224	222	243
CFI	0.957	0.965	0.947	0.947	0.932
TLI	0.947	0.955	0.941	0.940	0.923
RMSEA	0.039	0.036	0.031	0.031	0.030
t1STE → t1ASC	0.230***	0.229***	0.231***	0.232***	0.279***
t1ASC → t1SEL	0.378***	0.370***	0.373***	0.374***	0.404***
t1STR → t1SVA	0.513***	0.511***	0.512***	0.510***	0.517***
t1SVA → t1SEL	0.432***	0.418***	0.414***	0.413***	0.479***
t1SEL → t1CAS	0.564***	0.481***	0.508***	0.508***	0.554***
t1STE → t1CAS total	0.049**	0.263***	0.252***	0.248***	0.302***
t1STE → t1CAS direct	-	0.223**	0.208**	0.204**	0.240***
t1STE → t1CAS indirect	0.049**	0.041**	0.044**	0.044**	0.062***
t1STR → t1CAS total	0.125***	0.161*	0.171*	0.176*	0.153**
t1STR → t1CAS direct	-	0.059	0.064	0.069	0.016
t1STR → t1CAS indirect	0.125***	0.103***	0.107***	0.107***	0.137***
t1SEL → t2SEL	-	-	0.302**	0.301**	0.351***
t1CAS → t2CAS	-	-	-0.074	-0.103	-0.136
t2SEL → t2CAS	-	-	0.400***	0.390***	0.349***
t1STE → t2CAS total	-	-	-0.008	-0.105	-0.028
t1STE → t2CAS direct	-	-	-	-0.089	-0.000
t1STE → t2CAS indirect	-	-	-0.008	-0.015	-0.027
t1STE → t2CAS spez.ind. ⁸	-	-	0.010*	0.010*	0.014*
t1STR → t2CAS total	-	-	0.013	0.174	0.120
t1STR → t2CAS direct	-	-	-	0.168	0.110
t1STR → t2CAS indirect	-	-	0.013	0.007	0.009
t1STR → t2CAS spez.ind. ⁹	-	-	0.026*	0.025*	0.030**
t2CAS → t2FE	-	-	-	-	0.208*

⁷ Model E includes a categorical variable ‘undertaking further education’: yes/no. The adequate estimator recommended by Wang and Wang (2012) is ‘mean and variance-adjusted weight least squares’ (WLMSV). Due to this change of estimator, path coefficients may have changed additionally from Model D to Model E.

⁸ Only one significant specific indirect path, via t1ASC, t1SEL, t2SEL

⁹ Only one significant specific indirect path, via t1SVA, t1SEL, t2SEL

t1ASC→ t2FE	-	-	-	-	0.302 ^{***}
t1STE→t2FE indirect	-	-	-	-	0.078
t1STE→t2FE spez.ind. ¹⁰	-	-	-	-	0.084 ^{**}
t1STR→t2FE indirect	-	-	-	-	0.025
t1STR→t2FE spez.ind. ¹¹	-	-	-	-	0.006 [†]
<hr/>					
R ²					
t1ASC	0.053 [*]	0.053 [*]	0.054 [*]	0.054 [*]	0.078 [*]
t1SVA	0.263 ^{***}	0.261 ^{***}	0.262 ^{***}	0.260 ^{***}	0.268 ^{***}
t1SEL	0.347 ^{***}	0.328 ^{***}	0.327 ^{***}	0.327 ^{***}	0.421 ^{***}
t1CAS	0.318 ^{***}	0.350 ^{***}	0.372 ^{***}	0.373 ^{***}	0.436 ^{***}
t2SEL			0.091	0.090	0.123 [*]
t2CAS			0.155 [†]	0.174 [*]	0.131 [*]
t2FE					0.138 [*]

Notes. [†] $p > .10$ * $p < .05$, ** $p < .01$, *** $p < .001$, STE=Support Teacher, STR=Support VET-Trainer, ASC=Ability self-concept, SVA=Skill variety, SEL=Self-esteem, CAS=Career aspirations, FE=Further education

We next assessed the significance of the specific paths with MPlus to test our hypotheses (Muthén and Muthén, 2012) (see Table 2). In the final Model E, VET-teacher support is related directly with t1 career aspirations ($\beta = .240$, $p < .001$) which supports H1a. The results further support H1b, predicting that this relationship is partially mediated by t1 ability self-concept, VET-school and t1 self-esteem ($\beta = .062$, $p < .001$). In contrast, VET-trainer support didn't have a significant direct effect. Thus H2a is rejected. However we found a significant indirect path from VET-trainer support to t1 career aspirations ($\beta = .137$, $p < .001$). This supports H2b, predicting that the relation between VET-trainer support and t1 career aspirations is mediated by skill variety and self-esteem.

The direct paths from t1 support (VET-teacher and VET-trainer) to t2 career aspirations are not significant, but we found a significant specific indirect path from VET-teacher support to t2 career aspirations via t1 ability self-concept at VET-school, t1 self-esteem and t2 self-esteem ($\beta = .014$, $p < .05$). Similar results were obtained for VET-trainer support: We found a specific indirect path to t2 career aspirations via t1 skill variety, t1 self-esteem and t2 self-esteem ($\beta = .030$, $p < .01$). These results support H3 and H4 expecting that (only) indirect paths lead from t1 support to career aspirations at t2.

As expected, relations from t1 support to further education are only weak: For VET-teacher support, there is a specific indirect effect via ability self-concept at VET-school ($\beta = .084$, $p < .01$). For VET-trainer support, a near-significant indirect path leads to t2 further education via t1 skill variety, t1 self-esteem, t2 self-esteem and t2 career aspirations ($\beta = .006$, $p < .1$). Hence, results support H5a at least partially. Finally the path from t1 ability self-concept ($\beta = .302$, $p < .001$) is highly significant. Thus Hypothesis 5b is confirmed.

The final Model E is presented in Figure 2.

¹⁰ Only one significant specific indirect path, via t1ASC

¹¹ One nearly significant specific indirect path, via t1SVA, t1SEL, t2SEL, T2CAS

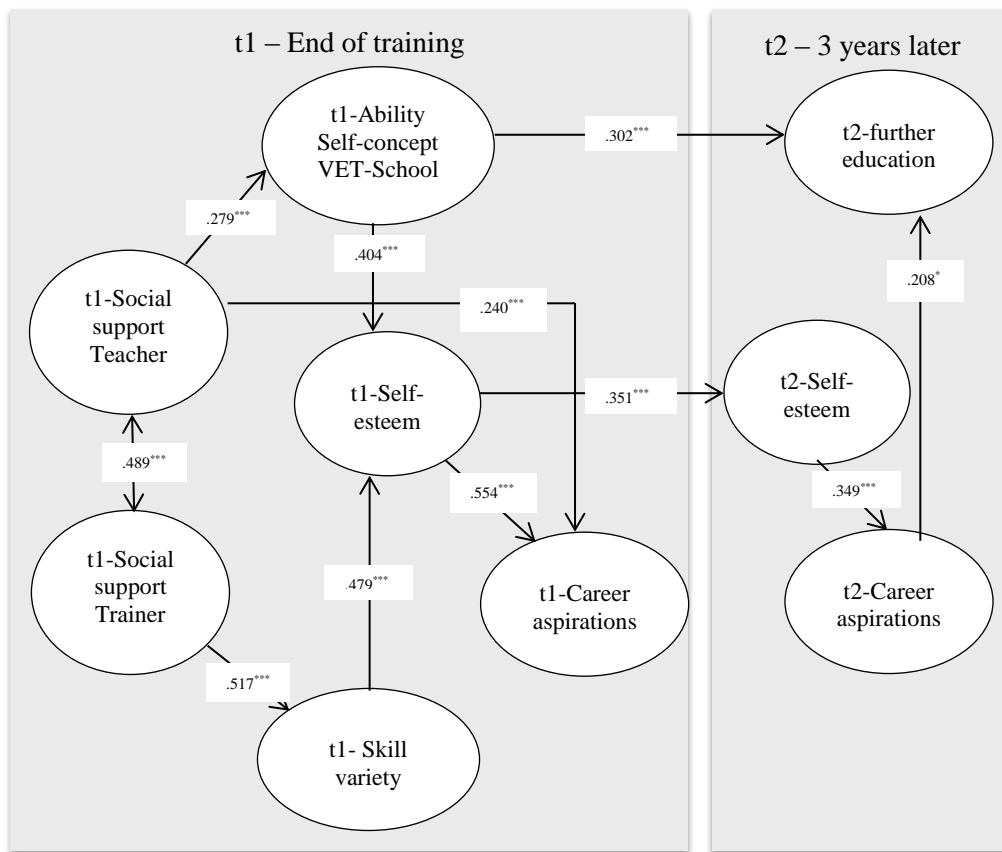


Figure 2: Influences of social support on career aspirations at the end of the training and three years later (only significant paths, N=525)

5 Discussion and conclusions

The goal of this study was to expand our understanding of the relationships between support during VET and career development for young adolescents with learning difficulties. We argued that the two learning environments (VET-school, VET-company) with their specific demands, offer different support opportunities and modalities. We therefore hypothesised different paths between VET-teacher support and VET-trainer support to career outcomes.

Our final structural model supported the general hypothesis that indirect paths are important in this context. As predicted, VET-teacher support positively influenced ability self-concept at VET-school and in this way self-esteem and career aspirations at the end of the apprenticeship. Moreover, VET-teacher support was directly related to career aspirations. Things are different for VET-trainer support where we only found indirect effects on career aspirations via skill variety and self-esteem, but these paths were stronger than VET-teacher's indirect effects.

This difference—direct effects for the VET-school environment and indirect effects only for the VET-company environment—makes sense if we consider the different conditions and cultures of the two learning contexts. At the VET-company, training is embedded in the production process and apprentices participate in everyday work situations (Stalder and Nägele, 2011). Learning and practicing of skills is done under the supervision of the VET-trainer or an experienced worker colleague. Thus feedback and coaching of the VET-trainer is

closely related to company-specific tasks and often takes place under time pressure (see Berweger et al., 2013). Vocational schools on the other hand complement and expand the practical training of the companies by providing theoretical knowledge in the occupational field and in general subjects (Stalder and Nägele, 2011). VET-teachers knowledge transfer is based more on communication and direct instruction, and they provide learning content aimed at the practice of the profession in general (Neuenschwander et al., 2012). Therefore, career prospects and planning are probably more prominent in this context.

However, the importance of the indirect paths in both areas supports previous findings in this context (e.g., Pan et al., 2011; Pinquart et al., 2003). Contrary to expectations, we did not find direct effects of VET-teacher or VET-trainer support on self-esteem. The respective paths were completely mediated by domain specific beliefs ('ability self-concept at VET-school') or opportunities at the VET-company ('skill variety'). VET-teachers and VET-trainers are probably most credible in their own sphere of influence (see Thoits, 2011), and their direct influence on more stable constructs as self-esteem is limited. Nonetheless, self-esteem is essential for the pathway from support to career aspirations: As our results show, self-esteem mediates the relation between the two domain-specific concepts and career aspirations. We conclude that this more general self-evaluation serves to integrate domain specific information about the self in view of future career options.

Our findings concerning the cross-sectional relations at t1 are a contribution to identifying some of the underlying processes involved in different supporting relationships in the two learning contexts of VET. On the other hand, and in line with other studies (e.g., Diemer, 2007; Frese, 1999), we had problems detecting longitudinal effects over three years of social support in general and finding effects on behaviour (undertaking further education) in particular. Even career aspirations themselves were not stable from t1 to t2. The lack of significant longitudinal effects may be due to different reasons. First of all, we asked at the end of the training for effects of past support (during apprenticeship) and related it to later career aspirations in a work-situation usually not in the same company. Secondly, we have an interval of three years. In these three years, all young adults changed from an educational context into the labour market. During the three year period, most likely, additional factors (e.g., support from work colleagues, work-satisfaction) were relevant for career motivation and aspirations and probably caused instability of career aspirations as well.

5.1 Limitations and further research needs

This study has some limitations. First off, our sample-size was at the lower end of what is necessary to examine complex interrelations. This may have restricted the power needed to obtain significant results. Indeed, Wang and Wang (2012) recommend as a rule of thumb that the minimum sample size should be at least five times the number of free parameters; with kurtotic data even more. This is a particular concern for t2 where we have an N of only 268. The response rate is 51%, which is usual, but nevertheless high, panel mortality.

Secondly, causality cannot be inferred for our cross-sectional results (t1). Based on theory and past research, the proposed causal order is reasonable, but other directions of influence cannot be excluded. While some reverse relationships are not convincing (e.g., that career aspirations influence self-esteem), others are possible. For example, it can be argued that people with high self-esteem are more proactive in their careers and hence more likely to search for support and to find

work contexts that offer learning possibilities. Furthermore, people's career success could increase the chances of obtaining a mentor (Whitely, 1991 in Day; Allen, 2004, p. 87). However, we think that in our context (apprenticeship for apprentices with learning difficulties and special needs), support is more institutionalised. Thus the need for support should elicit support independent of the apprentice's motivation. In any case, longitudinal studies with more measurement points would allow for cross-lagged models and causality conclusions.

Thirdly, this study relies on self-reports as the method of data collection. With the exception of 'undertaking further education' (which is, as factual information, probably less likely to suffer from problems of common method variance; Day and Allen, 2004), all other variables are subjective. Furthermore, we cannot exclude social desirability effects. Although it may be that the problem of common method variance has been overstated (Spector, 2006), future research should include multisource ratings. It would be especially interesting to have information about the quantity and quality of support from the perspective of the supporters (VET-teacher, VET-trainer). Additionally, family support and interaction effects between different support sources (e.g., between private and professional support) could be included in more elaborated models.

5.2 Practical implications

Given the limited resources that young people with learning difficulties have, maximizing the impact of professional support upon their career development in both learning environments is vital. VET-teacher's direct influence on career aspirations (and via ability self-concept on undertaking further education) seems to be essential. The key role of the VET-teacher also implies a high responsibility to give adequate feedback and really recognise the potential of some apprentices (without neglecting the others). VET-teachers normally have many students at the same time, and they may thus underestimate the importance of their influence on their students. It is important to inform VET-teachers about their crucial role.

Trainers at the VET-company are in another position, as already mentioned above. Offering a wide range of tasks and 'skill variety' seems crucial, and it is important that VET-companies and VET-trainers are aware of this. Moreover, it may be possible to strengthen direct positive effects of VET-trainers (or colleagues at the VET-company) on career aspirations by making career planning and further education a more important subject of discussion in the VET-company. However, both learning sites address theoretical and practical issues, and cooperation between VET-schools and VET-companies is essential and has already been strengthened (Stalder and Nägele, 2011), especially in the two-year VET-program.

Finally, it is important to note that career support does not necessarily end with the end of the training and successful graduation. For though the rate of 95% with a qualification at the upper secondary level has almost been met, the youth unemployment rate in Switzerland increased (OECD, 2013). Young workers with learning difficulties are especially at risk here. New models aimed to facilitate labour-market entry are evaluated under the label of 'supported employment', which promises longer-lasting professional integration and employability, especially for weaker employees in the labour market.

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