

DISCUSSION PAPER SERIES

IZA DP No. 11403

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ABSTRACT

Further Training and Affective Commitment

We investigate the relation of further training and employees' affective commitment. In doing so, we distinguish between a support effect and a participation effect: On the one hand we analyze how a firm's general support for further training is associated with the affective commitment of their employees and on the other hand how individual participation in further training relates to affective commitment. Using the Linked Personnel Panel (LPP), which is a longitudinally linked employer-employee data set, we are able to control for several human resource management instruments additionally to the usual demographics and job characteristics. Moreover, the two-level structure of the data allows us to analyze the support effect from a firm's perspective and an individually perceived perspective. Results show that employees' participation in further training is positively related to affective commitment, but that a general perceived firm's support for personnel development mediates the positive relation of participation in further training and individual affective commitment. Furthermore, we find that the relation of perceived firm's interest in personnel development and affective commitment is increasing with years of schooling and decreasing with age.

JEL Classification: M53, M12, J24

Keywords: commitment, further training, signalling,
linked employer-employee data

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1. Introduction

Employees' commitment towards their organizations has become a widely discussed topic during the last quarter of a century. Empirical work indicates strong associations between commitment and important outcome variables for organizations, such as lower absenteeism and turnover rates as well as higher performance and productivity level of employees (Randall, 1990; Cooper-Hakim & Viswesvaran, 2005). In particular, the affective component of organizational commitment shows meaningful relations to these relevant outcome variables (Mowday, Steers, & Porter, 1979; Meyer et al., 2002; Bergmann, 2006). Hence, one of the key questions for human resource management in organizations is that of how to increase the affective commitment of employees. The meta-analyses by Mathieu and Zajac (1990) and Meyer et al. (2002) show different measures for organizations which are significantly positively related to employees' commitment, such as the employees' perception of fairness regarding the communication with, decision procedures of, performance appraisal by and feedback from the leader and the perceived task autonomy. Moreover, the amount of pay and the feasible benefits are positively related to the affective commitment of employees (Meyer & Smith, 2000).

Additionally, there are a few empirical findings which state that (perceived support for) further training is significantly and positively related to the (affective) commitment of employees (Bartlett, 2001; Ahmad & Bakar, 2003; Bartlett & Kang, 2004; Al-Emadi & Marquardt, 2007; Bulut & Culha, 2010; Ling, Quing, & Shen, 2014; Bashir & Long, 2015; Cao & Hamori, 2016; Kooij & Boon, 2018). These studies, however, analyze very specific and small samples and include only a few control variables.

We build on these studies and add to the literature by investigating the relation of further training and affective commitment with two complementing facets. We disentangle the relevance that an employer's general support for further training holds and the relevance which an employee's individual participation in further training holds for the individual affective commitment. To do so, we make use of the German Linked Personnel Panel (LPP), which combines firm-based information with information provided by several of those employees. The two-level structure of the data allows us to analyze two distinctive channels of how further training affects employees' commitment: the pure availability of further training on a firm level vs. the actual participation in further training on an individual level. Hence, the main question is: Is the availability of further training (a support effect) sufficient to raise the affective commitment of employees or is participation in it (a participation effect) necessary for higher affective commitment? Moreover, due to the structure of the LPP, we are able to measure the support effect

from the firm perspective on the one hand and additionally from the individually perceived perspective on the other hand. Results show that this differentiation is significantly important for the relation of (perceived support for) further training and affective commitment, because we find that neither participation in further training nor the firm's perspective measure of further training, but employees' generally perceived support from the firm for personnel development is the relevant construct to significantly raise employees' affective commitment. In addition, the LPP provides some information about further human resource management instruments on a firm level and an individual level that can also lead to higher affective commitment of employees. These instruments have not been considered in previous work on the topic.

Allen and Meyer (1990) establish the three-component concept of organizational commitment, which consists of the three constructs "affective", "continuance" and "normative" commitment. The first of these describes the emotional component of employees and their psychological attachment towards the organization. Allen and Meyer define their concept thus: "Employees with strong affective commitment remain because they want to, those with strong continuance commitment because they need to, and those with strong normative commitment because they feel they ought to do so" (Allen & Meyer, 1990, p. 3). Affectively committed individuals identify with their organization, since the values and goals of the organization go along with employees' perceptions. For this reason, the individual develops a feeling of pride and loyalty towards the organization (Mowday et al., 1979; Allen & Meyer, 1990). Therefore, Allen and Meyer developed a scale to explicitly measure the affective commitment of employees based on the Organizational Commitment Questionnaire (OCQ) of Porter et al. (1974). The short form and scale of affective commitment developed by Meyer and Allen (1993) is part of the LPP.

The remainder of this contribution is structured as follows: Section 2 contains the theoretical framework, hypotheses and previous empirical findings followed by a description of the data and the empirical strategy in Section 3. We present our results in Section 4 and mention some limitations. In Section 5 we conclude and show some implications for organizations.

2. Theoretical background and previous empirical work

The social exchange concept assumes in general that in response to a beneficial act, individuals will reciprocate these gestures of goodwill in the future (Blau, 1964). This assumption is used to explain why employees exhibit behaviors that are contractually not enforceable, such as loy-

alty and commitment to the firm (Settoon, Bennett, & Robert, 1996). The concept of gift exchange, which has evolved from the context of organizations, is directly connected to the social exchange concept. Employees can perceive participation in further training as a gift from their firm and - as a gift sent in return - the employees increase their positive attitudes towards their organization (Akerlof, 1982; Akerlof, 1984). The norm of reciprocity is a characteristic of both social exchange theory and the gift exchange approach (Gouldner, 1960; Fehr & Gächter, 2000). Many trust or gift-exchange games show that participants react in a reciprocal way. The higher the received amount of money, which they can decide whether to share with another participant, the higher the portion for the counterpart if they do decide to share (Fehr, Kirchsteiger, & Riedl, 1993; Berg, Dickhaut, & McCabe, 1995; McCabe, Rassenti, & Smith, 1996). Kampkötter and Marggraf (2015) examine the effect of employees' participation in general trainings on turnover rates and find a negative impact. They explain their findings with the concept of gift exchange. Additionally, this result stresses the relevance of the affective commitment of employees as our dependent variable, because the concepts of gift exchange and reciprocity include also the emotional component of the affective commitment of employees. Bartlett (2001) examined the relationship of employee perceptions of training and organizational commitment among a sample of 337 nurses from five hospitals. The results are mainly based on a bivariate correlation analysis and show that duration and frequency of training participation are significantly and positively related to affective commitment. Perceived access to and support for training, motivation to learn and perceived benefits of training are also positively related to organizational commitment when controlling for organizational size and job satisfaction, but not when controlling for other individual or job-based characteristics (Bartlett, 2001). Bulut and Culha (2010) find similar results for the relationship between employees' perceived support for, access to and benefits from training and affective commitment. Again, the results are based on a correlation analysis and a very restricted sample of 298 employees of hotels operating in Turkey. Furthermore, a few different studies found positive and significant binary correlations between employees' perceived support for, access to, benefits from and motivation for training and employees' organizational commitment (Ahmad & Bakar, 2003; Bashir & Long, 2015; Al-Emadi & Marquardt, 2007). Finally, Benson (2006) finds in a cross-sectional analysis of employees from one specific firm that participation in on-the-job training is positively related to affective commitment.

Based on these concepts and findings, we assume that employees can perceive participation in further training as a gift from their firm. Employees feel as though they are valued by and important to their firm, so they react in a reciprocal way and consequently develop a higher affective commitment to the firm. This leads to the following

Hypothesis 1: Participation in further training is positively related to the individual affective commitment of employees.

Furthermore, according to signaling theory, people interpret organizations' observable actions as signals of less observable firm characteristics (Spence, 1973; Butts, Wendy, & Tae, 2013), such that the availability of further training in a firm can be interpreted as a signal that the organization cares about its employees. Additionally, perceived organizational support theory indicates that employees develop a belief of the extent to which the organization cares about their well-being, which leads to obligations within individuals to return something positive (Eisenberger et al., 1986; Settoon et al., 1996). The employees might reciprocate through higher affective commitment. Bartlett and Kang (2004) find in their cross-sectional analysis of nurses that perceived supervisory support for training is positively related to affective commitment of employees, as well as Ling et al. (2014) who investigate a small sample of Chinese employees in a cross-sectional design. This leads to our second hypothesis:

Hypothesis 2: A firm's general support for further training is positively related to the individual affective commitment of employees.

The considerations named above lead to the key question of our paper. Is a firm's support for further training sufficient for higher affective commitment of employees or is the latter's actual participation in further training necessary in order to raise their affective commitment? Butts et al. (2013) find evidence that the firm's signal of benevolence is already related to higher work attitudes of employees. This might suggest that the relation of participation in further training and work attitudes of employees, i.e. affective commitment, is mediated by a firm's making further training available.

Hypothesis 3: The positive relation of participation in further training and individual affective commitment is partly mediated by a firm's general support for further training.

Previous empirical work with regard to the latter hypothesis is limited due to data restrictions: Cao and Hamori (2015) find in a cross-sectional analysis of 312 young professionals that development assignments and perceived support from senior management regarding their career

are the strongest driver of organizational commitment compared to other development practices as training and mentoring. However, this study does not include further HR instruments, e.g. conduction of appraisal interviews or employee surveys, as control variables and measure all relevant variables only from an employees' perceived perspective. The study of Kooij and Boon (2018) indicates, by using a structural equation model, that perceived high-performance work practices affect employees' affective commitment positively, but possible different HR instruments effects on affective commitment are not analyzed in this study.

3. Data, variables and methodology

The analysis is based on the Linked Personnel Panel (LPP), which is a longitudinally linked employer-employee data set of establishments and several of their employees in Germany (Bellmann et al., 2015). On the establishment level, the LPP is representative of German establishments with 50 and more employees in the processing industry and in the service sector. The industries are divided into the following categories: processing industry; metal, electrical industry and automotive sector; commerce, traffic and communication; company-related and financial services; IT, communication and other services. The first wave (2012/2013) of LPP contains a survey of 1,219 establishments and 7,500 employees of these establishments and the second wave (2014/2015) implies 771 establishments and about 7,200 employees (3,000 employees are the same). The LPP includes information on job, firm and personnel characteristics as well as employee attitudes towards the organization. Moreover, the LPP can be linked to the IAB establishment panel, which includes additional establishment information.¹

We restrict our sample to employees who reported valid information about their affective commitment and are between 21 and 65 years old. Additionally, we dropped all employees with a monthly gross pay of less than 450 € and more than 100,000 €. Furthermore we excluded those establishments with only one corresponding employee in the data. About 2,300 employees did not agree to the merging of data, such that our unbalanced panel includes 8,469 observations of 7,000 individuals in 837 firms.

Our dependent variable *affective commitment* is computed as a standardized index measured by six items with possible answers from 1 (does not apply at all) to 5 (fully applies) based on the

¹ Data access was provided via on-site use at the Research data Centre (FDZ) of the German Federal Employment Agency (BA) at the Institute for Employment Research (IAB) and subsequently remote data access. The project-number is fdz1234.

affective commitment questionnaire of Allen and Meyer (1990). For example, the participants are asked to respond to “I would be very happy to spend the rest of my career with this organization”, “This organization has a great deal of personal meaning for me”, “I really feel as if this organization’s problems are my own” and three items are asked on a reversed scale.² On the individual level, *participation in further training* adopts 1 if the employee has taken part in any courses of further training in the most recent year and 0 otherwise (participation effect).

To find out whether the support or the participation effect prevails for the relationship between further training and affective commitment, the following variables are considered as well: We measure the support effect from two perspectives. First, on the individual level, the variable *perceived firm’s interest in personnel development* indicates to what extent employees consider their establishment to be interested in further development of their professional knowledge and competencies (Kampkötter et al., 2016). Hence, this variable measures the employees’ general perception about the extent to which the employer is interested in developing human capital on a five-point Likert scale from 1 “strongly disagree” to 5 “strongly agree”. Second, on the firm level, there is information on the availability of further training in the firm, such as *support of employees for further training*, which is a binary variable. The employer declared whether they had actively supported employees’ qualification activities, leading to a higher educational qualification, in the last two years, e.g. by releasing them from work or partially bearing the costs. The *firm’s training volume* is measured as the total number of participants in further training divided by the total number of employees.³ This variable is also measured on firm level and depicts an alternative for examining the support effect.

We also use information from the employer survey in order to control for numerous human resource management instruments which may signal to employees that their firm cares about them, such as the availability of development and staffing plans, the conduction of appraisal interviews and employee surveys, the existence of target agreements and participation in auditing processes. We use these variables as control variables for the support effect regarding a firm’s support for further training. Neglecting these HR instruments may otherwise lead to an

² These items are taken from the affective commitment short form and scale of Meyer et al. (1993). For a detailed list of the items, see Appendix 1 and Kampkötter et al. (2016).

³ The information about “Total number of participants in further training” refers to a period of time in the survey (the first half of a particular year), whereas the information about “Total number of employees” refers to a point in time (30 June of a particular year).

omitted variable bias, because these instruments are significantly correlated to the provision of further training.⁴

Further control variables for employees' participation in certain human resource management instruments are the appraisal interview of employees with their superior in the most recent year and whether working from home is feasible. In addition, the employee survey provides information about the employees' perceived fairness of income, decision procedures and supervisors, which represent the three dimensions of distributive, procedural and interactional justice and are measured on a five-point Likert scale from 1 (does not apply at all) to 5 (fully applies). Several studies show that this variable is relevant for affective commitment (Mathieu & Zajac, 1990; Dailey & Kirk, 1992; Sweeney & McFarlin, 1993; Lemons & Jones, 2001). Furthermore, we control for the average affective commitment of other firm employees by computing the mean of the affective commitment of all employees, excluding the particular individual, in order to control for a potential spill-over commitment effect and capturing some unobserved firm effects.

We also control for socio-demographic variables as well as for individual job-related and further firm characteristics, such as employment situation and leadership position, part-/full-time, wage, collective agreement, work's council, firm size, region and industry. Most of these variables have been identified as relevant for (affective) commitment in previous studies (Meyer & Smith, 2000; Meyer et al., 2002; Ahmad & Bakar, 2003) or are significantly correlated with further training.

A share of 0.36 of the employees participated in further training during the years 2012 and 2014 (Table 1). On average, employees report a level of affective commitment of about 3.7 (from 5) and of their perceived firm's interest in personnel development of about 3.54 (from 5). About 0.73 employees of our sample are male. On average, the employees are 46 years old, 0.84 are in a relationship and 0.25 of them have children under 14 years. 0.02 of individuals are non-German nationals. On average, the employees exhibit 12.54 years of schooling. About 0.88 of them work full-time and at least earn € 3,459 per month. Two out of five individuals have either a blue collar or a white collar position, whereas 0.2 work as a manager with some kind of leadership tasks. About half of the employees participated in appraisal interviews with their

⁴ See Appendix 4 for detailed correlations.

supervisors. Only 0.14 of the employees are allowed to work from home. On average, employees report a level of perceived fairness regarding income, decision procedures and supervisors of about 3.61 (from 5).

Four out of five firms declared that they support their employees in further training, and the training volume per firm is 0.37, which means that a firm conducted about 0.37 activities of further training per employee in the first half of the particular year. The average commitment of other firm employees is about 3.71 (from 5.56). About 0.71 of the sample consists of firms with collective wage agreements and 0.35 are firms with 500 and more employees. In addition, about 0.68 of the firms are in the processing and metal, electrical industries. About 0.79 of the firms have staffing plans and target agreements for their employees, conduct appraisal interviews and participate in certification and auditing processes. Almost two thirds of firms have development plans for their employees and half of them conduct employee surveys.

Those employees who have participated in further training (n=3,066) report a higher level of perceived firms' interest in personnel development of about 4 (from 5) compared to employees who have not participated in further training (n=5,403). Furthermore, a share of 0.29 of employees who have participated in further training are managers. Only 0.16 of employees who have not participated in further training are manager on average. Employees who have participated in further training tend to work from home (0.25), are more likely to participate in appraisal interviews (0.63) and earn on average 700 € more than employees who have not participated in further training. Moreover, employees who have participated in further training tend to work in firms with higher training volume and which implement HR instruments more frequently than employees do who have not participated in further training.

Table 1: Descriptive Statistics

Variable	Whole sample (n=8,469)				Further training (n=3,066)	No further training (n=5,403)
	Mean/Share	SD	Min	Max	Mean/Share	Mean/Share
Individual variables						
Affective commitment	0	1	-3.03	1.45	0.17	-0.09
Affective commitment (not standardized)	3.7	0.89	1	5	3.85	3.62
Participation in further training	0.36		0	1	1	0
Perceived firm's interest in personnel development	3.54	1.23	1	5	4.00	3.28
Female	0.27		0	1	0.27	0.27
Age	45.96	10.5	21	65	45.18	46.41
Children < 14	0.25		0	1	0.27	0.24
In relationship	0.84		0	1	0.86	0.83
Non-German national	0.02		0	1	0.02	0.02
Schooling (in years)	12.54	2.29	7	18	13.01	12.27
Big Five Openness	3.35	0.5	1	5	3.38	3.33
Big Five Conscientiousness	4.37	0.48	1.33	5	4.35	4.37
Big Five Extraversion	3.71	0.72	1	5	3.77	3.68
Big Five Neuroticism	2.72	0.77	1	5	2.64	2.76
Big Five Agreeableness	4.06	0.57	1	5	4.07	4.06
Part-time	0.12		0	1	0.11	0.13
Occupational status						
Blue-collar worker	0.40		1	3	0.27	0.48
White-collar worker	0.39				0.44	0.36
Manager	0.21				0.29	0.16
Monthly gross pay (in €)	3459.50	2520.38	450	100,000	3,911.36	3,200.87
Work from home	0.18		0	1	0.25	0.13
Participation in appraisal interview	0.47		0	1	0.63	0.39
Perceived fairness	3.61	0.79	1	5	3.74	3.54

Firm variables						
Support for further training	0.79		0	1	0.83	0.76
Firm's training volume	0.37	0.34	0	3.63	0.43	0.34
<hr/>						
Firm size			1	4		
50-99 employees	0.13				0.12	0.14
100-249 employees	0.26				0.23	0.27
250-499 employees	0.26				0.25	0.26
500 and > employees	0.35				0.4	0.33
Region ^{a)}			1	4		
North	0.16				0.17	0.16
East	0.27				0.24	0.29
South	0.26				0.29	0.25
West	0.29				0.3	0.3
Industry			1	5		
Processing industry	0.31				0.31	0.32
Metal, electrical industry	0.37				0.34	0.39
Commerce, traffic industry	0.11				0.12	0.11
(Financial) services	0.14				0.14	0.13
IT, communication	0.07				0.09	0.05
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Collective wage agreement	0.71		0	1	0.74	0.69
Work's council	0.81		0	1	0.85	0.79
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Incidence of existing HR instruments						
Auditing	0.79		0	1	0.80	0.78
Development plans	0.62		0	1	0.67	0.59
Employee survey	0.49		0	1	0.54	0.46
Conduction of appraisal interview	0.79		0	1	0.84	0.79
Staffing plan	0.79		0	1	0.82	0.76
Target agreements	0.78		0	1	0.83	0.75
<hr/>						
Average commitment of other firm employees	0	1	-7.84	3.89	0.11	-0.06
<hr/>						
Average commitment of other firm employees (not standardized)	3.71	0.89	0	5.56	3.77	3.68

Notes: ^{a)}Northern region: Lower Saxony, Schleswig-Holstein, Hamburg, Bremen; Eastern region: Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt, Thuringia; Southern region: Bavaria, Baden-Wuerttemberg; Western region: North Rhine-Westphalia, Hesse, Saarland, Rhineland-Palatinate.

We apply OLS and fixed effects estimations in order to analyze the relation of further training and affective commitment, which can be described by the following equation:

$$\begin{aligned}
 AC_{i,t} = & \beta_0 + \beta_1 * \textit{participation in further training}_{i,t} \\
 & + \beta_2 * \textit{firm's training volume}_{i,t} \\
 & + \beta_3 * \textit{support for further training}_{i,t} \\
 & + \beta_4 * \textit{perceived firm's interest in personnel development}_{i,t} \\
 & + \gamma * \textit{controls}_{i,t} + \varepsilon_{i,t} ,
 \end{aligned}$$

where $AC_{i,t}$ is the individual *affective commitment* of employees and the binary variable *participation in further training* is our main measure for the possible participation effect as described above. The *firm's training volume* and the dummy variable *firm's support for employees in further training* (1=yes) measure the support effect on firm level. The extent of the *perceived firm's interest in personnel development* measures the support effect on an individual level. *Controls* is a vector of socio-demographic, individual job-related variables and firm characteristics, and control variables for employees' participation in or a firm's support for HR instruments mentioned above. By clustering standard errors at the firm level, we take some firm differences into account.

4. Results

We start our empirical analysis by examining the relation of participation in further training and affective commitment. The results of our OLS estimations with affective commitment as dependent variable are reported in Model (1-3) of Table 2. Model (1) includes information on employees' participation in further training and socio-demographic variables which have been identified as relevant variables for affective commitment in previous studies (Mathieu & Zajac, 1990; Meyer et al., 2002). Employees' participation in further training is significantly and positively related to the individual affective commitment. The results of the demographics indicate, at first glance, that women are less committed than men.

In Model (2) we include individual job-related variables and firm characteristics which have been identified as relevant variables for affective commitment in the literature (Meyer & Smith, 2000; Ahmad & Bakar, 2003). We also find a highly significant and positive relation of gross pay and affective commitment. Besides, managers exhibit a significantly higher affective commitment than blue-collar workers do. Additionally, we find that employees working part-time

are significantly more highly affectively committed than employees working full-time. Moreover, there is a significant, negative relation of employees' years of education and their affective commitment. The higher an employee's education, the more valuable that employee is to other firms on the market, which can reduce her or his affective commitment to the current firm. The results with regard to the firm characteristics indicate that employees working in the IT and communication industry or in the company-related and financial services industry are significantly less affectively committed than employees in the processing industry. The negative coefficient for females in Model (1) now turns around. Further analyses – available by the authors on request – reveal that the consideration of log gross pay leads to this shift. Moreover, employees who work in firms with collective wage agreements and/or with work's councils and/or in firms which are in East Germany show a significantly higher affective commitment compared to employees working in firms which are in North Germany and/or have no collective wage agreement or work's council. The coefficient of employees' participation in further training decreases but is still highly significantly and meaningfully positively related to individual affective commitment.

In order to disentangle the possible impact of further training on affective commitment from that of other management instruments, we additionally control for the incidence of several further HR instruments in Model (3). Employees who participated in appraisal interviews with their supervisors are significantly more highly affectively committed than employees who have not taken part in such interviews. Furthermore, employees who cannot work from home have a significantly lower affective commitment than employees who are able to work from home.

Moreover, employees working in firms which have employee surveys and staffing plans are significantly more highly affectively committed compared to employees who work in firms without such surveys and plans. Employees working in firms that agree targets with their employees have a significantly lower affective commitment. Participation in further training is still significantly positively associated with employees' affective commitment, which seems to confirm Hypothesis (1). However, the coefficient of participation in further training is not significant in the fixed effects model (4).

Table 2: OLS and individual fixed effects estimations on affective commitment

	OLS			Fixed effects
	(1)	(2)	(3)	(4)
Participation in further training	0.2758*** (0.0234)	0.1964*** (0.0228)	0.1659*** (0.0229)	0.0220 (0.0362)
Female	-0.1095*** (0.0266)	0.0853*** (0.0302)	0.0790*** (0.0298)	-
Age	0.0210*** (0.0011)	0.0169*** (0.0011)	0.0176*** (0.0011)	0.4388*** (0.1456)
Children < 14	0.0455* (0.0263)	0.0274 (0.0252)	0.0258 (0.0250)	-0.0543 (0.0746)
In relationship	0.1066*** (0.0308)	0.0298 (0.0293)	0.0193 (0.0294)	-0.0689 (0.0892)
Non-German national	-0.0044 (0.0751)	0.0201 (0.0733)	0.0474 (0.0729)	0.0339 (0.0892)
Schooling	0.0012 (0.0049)	-0.0387*** (0.0053)	-0.0434*** (0.0055)	-
Big Five Openness	0.0784*** (0.0251)	0.0518** (0.0248)	0.0419* (0.0246)	-
Big Five Conscientiousness	0.0624** (0.0253)	0.0722*** (0.0247)	0.0743*** (0.0246)	-
Big Five Extraversion	0.1018*** (0.0165)	0.0968*** (0.0162)	0.0913*** (0.0160)	-
Big Five Neuroticism	-0.0441*** (0.0159)	-0.0156 (0.0156)	-0.0124 (0.0155)	-
Big Five Agreeableness	0.1093*** (0.0210)	0.1398*** (0.0204)	0.1397*** (0.0204)	-
Part-time		0.2203*** (0.0393)	0.1947*** (0.0386)	0.1151 (0.1089)
Employment situation (Reference: Blue-collar worker)				
White-collar worker		0.0395 (0.0276)	0.0147 (0.0273)	-0.0154 (0.0731)
Manager		0.1724*** (0.032)	0.1322*** (0.0325)	0.0632 (0.0917)
Gross pay (log)		0.4790*** (0.0342)	0.4209*** (0.0339)	0.1388* (0.0811)
Collective agreement		0.0662** (0.031)	0.0589* (0.0315)	0.0745 (0.0787)
Work's council		0.0722* (0.0386)	0.0499 (0.0375)	0.0423 (0.1693)
Firm size (Reference: 50-99)				
100-249 employees		-0.0196 (0.0412)	-0.0274 (0.0406)	-0.0331 (0.1609)
250-499 employees		0.0084 (0.0430)	-0.0248 (0.0418)	0.0766 (0.1864)
500 and > employees		-0.0260 (0.0446)	-0.0664 (0.0445)	0.0092 (0.2064)

Region (Reference: North)				
East		0.0967** (0.0427)	0.0966** (0.0403)	-
South		0.0034 (0.0429)	0.0078 (0.0425)	-
West		0.0324 (0.0422)	0.0396 (0.0408)	-
Industry (Reference: Processing industry)				
Metal, electrical industry		0.0200 (0.0291)	0.0347 (0.0291)	-
Commerce, traffic industry		-0.0191 (0.0453)	-0.0222 (0.0443)	-
(Financial) services		-0.1506*** (0.0461)	-0.1592*** (0.0437)	-
IT, communication		-0.2875*** (0.0642)	-0.2870*** (0.0669)	-
Participation in appraisal interview			0.1854*** (0.0231)	0.0264 (0.0451)
Work from home			0.1072*** (0.0326)	0.0809 (0.0619)
Auditing			-0.0334 (0.0303)	0.0479 (0.0506)
Development plans			0.0161 (0.0315)	-0.0327 (0.0494)
Employee survey			0.0711*** (0.0262)	0.0009 (0.0482)
Conduction of appraisal interview			0.0049 (0.0356)	0.0372 (0.0563)
Staffing plan			0.0457 (0.0393)	-0.0948* (0.0539)
Target agreements			-0.0628* (0.0327)	-0.0031 (0.0620)
Year-dummy	yes	yes	yes	yes
Adjusted R ²	0.0880	0.1434	0.1539	0.0204
# Observations	8,469	8,469	8,469	8,469

Notes: Clustered robust standard errors at firm (OLS) and individual level (fixed effects) in parentheses.
*significant at 10%, **significant at 5%, ***significant at 1%.

In order to disentangle the relevance of the general support for further training from the employer and the individual participation in further training of employees, we add the different measures for the support effect in Table 3, which are *firm's training volume* and *support for further training* on the firm level and *perceived firm's interest in personnel development* on the individual level. We again control for all variables as in Model (3) of Table 2.

Model (1) of Table 3 shows that the firm's training volume is not significantly related to employees' affective commitment. The coefficient of participation in further training is still positively significant and comparable in size. We add the variable average commitment of other

firm employees (Model 2) in order to control for possible firm differences. Including a firm's average commitment of other firm employees indicates a potential spill-over effect, which means that the higher a firm's average commitment of other employees, the higher the individual affective commitment. This shows that differences in the average firm's commitment of employees seem to be relevant for the relation of participation in further training and individual affective commitment. But employees' participation in further training is still significantly and positively related to affective commitment.

We include the perceived fairness of employees regarding income, decision procedures and supervisor's behavior in Model (3), which is identified as a relevant measure for affective commitment by the literature (Mathieu & Zajac, 1990; Meyer et al., 2002). The coefficient of perceived fairness is highly significant and positive and the coefficient of participation in further training decreases in the amount of third. It is still meaningful and highly statistically significant, though. Model (3) explains about 0.29 of the variance of affective commitment, which is an increase of about 50% compared to the previous models. A firm's support for further training is also significantly positively related to employees' affective commitment (Model 4), which is in line with Hypothesis (2). However, participation in further training is still strongly significant and positive, such that the participation effect seems to prevail.

Model (5) shows a significant and positive relation of employees' general perception about the extent to which employers are interested in developing their human capital and their affective commitment. The relation of employees' participation in further training and affective commitment is no longer significant, which indicates that the support effect of a firm can be sufficient for higher affective commitment of its employees. However, we cannot rule out that a possible feeling by employees of esteem, triggered by positive feedback from the employer, could also lead to a higher affective commitment of employees and not just the signal effect. Model (5) includes all relevant variables and clarifies that a firm's general support significantly mediated the positive relation of participation in further training and individual affective commitment.

Table 3: OLS and individual fixed effects estimations on affective commitment

	OLS				Fixed effects	
	(1)	(2)	(3)	(4)	(5)	(6)
Participation in further training	0.1627*** (0.0232)	0.1563*** (0.0227)	0.1195*** (0.0209)	0.1156*** (0.0208)	0.0258 (0.0203)	-0.0049 (0.0348)
Firm's training volume	0.0600 (0.0427)	0.0456 (0.0379)	0.0467 (0.0336)	0.0276 (0.0335)	0.0139 (0.0306)	0.0264 (0.0711)
Support for further training				0.1434*** (0.0266)	0.1219*** (0.0254)	-0.0220 (0.0476)
Perceived firm's interest in personnel development					0.2067*** (0.0090)	0.0891*** (0.0203)
Average commitment of other firm employees		0.0735*** (0.0150)	0.0353*** (0.0132)	0.0285** (0.0131)	0.0192 (0.0125)	-0.0700*** (0.0241)
Perceived fairness			0.4892*** (0.0137)	0.4904*** (0.0136)	0.3672*** (0.0143)	0.2733*** (0.0324)
Controls	yes	yes	yes	yes	yes	yes
Adjusted R ²	0.1542	0.1588	0.2880	0.2906	0.3336	0.1132
# Observations	8,469	8,469	8,489	8,469	8,469	8,469

Notes: Clustered robust standard errors at firm (OLS) and individual level (fixed effects) in parentheses.

*significant at 10%, **significant at 5%, ***significant at 1%. Controls: female, age, children<14, in relationship, non-German nationals, schooling, big five, part-time, employment situation, gross pay, collective agreement, work's council, firm size, region, industry, participation in appraisal interviews, work from home, auditing, development plans, employee survey, conduction of appraisal interview, staffing plan, target agreement, year.

In Model (6) we run individual fixed effects estimations, which strengthen our previous results. An individually more highly perceived firm's interest in personnel development leads to higher affective commitment of employees, which shows again that it is the perceived general support for personnel development that is decisive for employees' affective commitment towards their organizations. Neither participation in further training nor the firm's perspective measure of support for further training is relevant for the individual affective commitment anymore. In sum, these results are in line with our Hypothesis (3).

Additionally, the positive coefficient of the average commitment of other firm employees in previous models now turns around. The OLS estimations indicate that there are differences

between employees and firms. Using the fixed effects model there is a somewhat surprising negative correlation considering the individual within variation.⁵

Previous research hints that younger and better educated employees have particular preferences for career prospects (Grund, 2013). To analyze the support effect in more detail, we extend our previous models by including interaction terms of a perceived firm's interest in personnel development and schooling as well as age (Table 4). Indeed, we find that the relation of a perceived firm's interest in personnel development and affective commitment is increasing in years of schooling (Model 1) and decreasing in age (Model 2). Both results are robust in a joint estimation of the two interaction terms in Model (3). The fixed effects model shows no significant results regarding the interaction terms. Coefficients of further interaction terms as a perceived firm's interest in personnel development and different HR instruments are also not significant (see Appendix 3).

We complement our analysis with the following robustness checks (see Appendix 2). First, we run our estimation model with the dependent variable *turnover intention* instead of affective commitment. The variable turnover intention is measured on five-point Likert scale from 1 (never) to 5 (daily). The participants are asked "How many times in the past 12 months have you thought about changing your job?". Hence, this variable is very similar to the individual affective commitment, since employees who are affectively committed to their organization should exhibit a lower turnover intention. Model (1) of Appendix 2 shows that an individually more highly perceived firm's interest in personnel development leads to significantly lower turnover intention, which confirms our main results. Models (2) and (3) include information only for the years 2012 (Model 2) and 2014 (Model 3). The results of the cross-sectional analysis are in line with our previous findings. Additionally, our results are robust for gender-specific estimations.

⁵ This result is not driven by changes in the composition of firms' employees asked for the LPP. Focusing on individuals who are included in both waves, the correlation of the changes in individual affective commitment and changes in average commitment of other firm employees is also significantly negative (-0.0587, $p = -0.0587^{**}$).

Table 4: OLS and individual fixed effects estimations on affective commitment (interaction effects)

	OLS			Fixed effects
	(1)	(2)	(3)	(4)
Participation in further training	0.0238 (0.0203)	0.025 (0.0203)	0.0231 (0.0203)	-0.0047 (0.0347)
Firm's training volume	0.0141 (0.0304)	0.0144 (0.0305)	0.0145 (0.0303)	0.0198 (0.0716)
Support for further training	0.1232*** (0.0254)	0.1235*** (0.0254)	0.1247*** (0.0254)	-0.0205 (0.0476)
Perceived firm's interest in personnel development	0.0749 (0.0458)	0.3144*** (0.0374)	0.1839*** (0.0583)	0.1906 (0.1408)
Age	0.0171*** (0.0010)	0.0254*** (0.0031)	0.0251*** (0.0030)	0.4569** (0.2295)
Schooling	-0.0624*** (0.015)	-0.024*** (0.0048)	-0.0611*** (0.0150)	-
Perceived firm's interest in personnel development * schooling	0.0107*** (0.0036)		0.0103*** (0.0036)	0.0017 (0.0080)
Perceived firm's interest in personnel development * age		-0.0023*** (0.0008)	-0.0022*** (0.0008)	-0.0025 (0.0020)
Controls	yes	yes	yes	yes
Adjusted R ²	0.3343	0.3344	0.3350	0.1142
# Observations	8,469	8,469	8,469	8,469

Notes: Clustered robust standard errors at firm (OLS) and individual level (fixed effects) in parentheses. *significant at 10%, **significant at 5%, ***significant at 1%. Controls: female, children<14, in relationship, non-German national, big five, part-time, employment situation, gross pay, collective agreement, work's council, firm size, region, industry, participation in appraisal interviews, work from home, auditing, development plans, employee survey, conduction of appraisal interview, staffing plan, target agreement, average commitment of other firm employees, perceived fairness, year.

Some limitations of this paper should be acknowledged. First, the longitudinal design of our study consists of only two waves, which leads to very small variation of the data regarding the important variables. However, several previous studies analyzing the relation of different dimensions of training and individual commitment have used a cross-sectional research design. Second, due to the fact that the number of employees of each firm is rather small, the possibility of examining subgroups of employees within the firms is somewhat limited. Third, due to the fact that employees with higher affective commitment tend to participate in further training or work in organizations with higher support for further training, the positive relation of further training and affective commitment could be the result of reverse causation.

5. Conclusions and implications

In contrast to previous studies that mainly concentrate either on the relation of *participation* in further training and affective commitment or perceived *support* for further training and affective commitment, this paper combines the two facets and examines whether the support or the participation effect is the crucial factor that leads to higher affective commitment of employees. Additionally, the structure of the data allows us to control for a bundle of human resource management instruments that can also be related to individual affective commitment and which have not been considered in previous work. First we find that participation in further training and a firm's support for further training are both significantly positively related to affective commitment of employees. We address the support effect in two different ways. We find that a general perceived firm's support for personnel development by the employees' acts as a decisive mediator for organizations to increase employees' affective commitment towards their firms. Neither actual participation in further training nor the firm's perspective measure of support in further training have an additional effect beyond the general support in personnel development. Hence, according to the signaling and perceived organizational support theories, it is important for organizations to signal that they care about employees' well-being and about the further personnel development of their professional knowledge and competencies. This study shows that HR instruments regarding employee's development, such as participation in appraisal interviews and in particular firms' support towards employees, both of which are controllable by managers' actions, are strongly related to individual affective commitment. Hence, employers should create an environment of encouragement to demonstrate their recognition of employees' contribution. A firm's signal of being supportive regarding employees' personnel development and competencies is particularly relevant for younger and better educated employees with regard to emotionally bonding with their organizations. Hence, our results hint at the specific necessity of firms' retention devices towards highly educated and young employees.

Future research may address the relation of further training and affective commitment over a longer period of time than two waves in order to monitor changes in employee attitudes. Moreover, with regard to the causality problem, additional information about employees' motivation to participate in further training on the one hand and about the firms' decision on who will be supported on the other hand would help to clarify the relation of further training and affective commitment in future research.

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Appendices

Appendix 1: Items of Affective Commitment in LPP

I would be very happy to spend the rest of my career with this organization.	I do not feel a strong sense of “belonging” to my organization. (R)
This organization has a great deal of personal meaning for me.	I do not feel “emotionally attached” to this organization. (R)
I really feel as if this organization’s problems are my own.	I do not feel like “part of the family” at my organization. (R)

Note: These items are measured on a five-point Likert scale from 1 (does not apply at all) to 5 (fully applies).

Appendix 2: Robustness Checks

	Turnover intention	year=2012	year=2014	Men	Women
	(1)	(2)	(3)	(4)	(5)
Participation in further training	-0.0087 (0.0377)	0.0016 (0.0266)	0.0509 (0.0310)	0.0326 (0.0229)	-0.0495 (0.0398)
Firm’s training volume	-0.0420 (0.0693)	0.0132 (0.0375)	0.0233 (0.0548)	0.0545 (0.0343)	-0.0745 (0.0507)
Support for further training	0.0461 (0.0551)	0.0864** (0.0341)	0.1700*** (0.0391)	0.1197*** (0.0298)	0.1444*** (0.0488)
Perceived firm’s interest in personnel development	-0.0730*** (0.0221)	0.2149*** (0.0135)	0.1947*** (0.0144)	0.2039*** (0.0115)	0.2147*** (0.0187)
Average commitment of other firm employees	-0.0477** (0.0245)	0.0178 (0.0161)	0.0115 (0.0201)	0.0266* (0.0143)	0.0107 (0.0204)
Perceived fairness	-0.2194*** (0.0356)	0.3749*** (0.0191)	0.3576*** (0.0215)	0.3842*** (0.0169)	0.3321*** (0.0264)
Controls	yes	yes	yes	yes	yes
Adjusted R ²	0.0738	0.3449	0.3172	0.3396	0.3174
# Observations	8,414	4,561	3,908	6,163	2,306

Notes: Clustered robust standard errors at firm (OLS) and individual (fixed effects) level in parentheses.

*significant at 10%, **significant at 5%, ***significant at 1%. Controls: female, age, children<14, in relationship, non-German national, schooling, big five, part-time, employment situation, gross pay, collective agreement, work’s council, firm size, region, industry, participation in appraisal interviews, work from home, auditing, development plans, employee survey, conduction of appraisal interview, staffing plan, target agreement, year.

Model (1): Individual fixed effects regression on turnover intention; Models (2, 3): Cross-sectional OLS regression on affective commitment; Models (4, 5): OLS regression on affective commitment included men and women only.

Appendix 3: Further interaction effects

	OLS	Fixed effects
	(1)	(2)
Participation in further training	0.0251 (0.0203)	-0.0065 (0.0349)
Firm's training volume	0.0134 (0.0306)	0.0286 (0.0713)
Support for further training	0.1212*** (0.0253)	-0.0163 (0.0472)
Perceived firm's interest in personnel development	0.2274*** (0.0239)	0.0943* (0.0530)
Perceived firm's interest in personnel development * auditing	-0.0123 (0.0198)	0.0138 (0.0385)
Perceived firm's interest in personnel development * development plans	-0.0186 (0.0196)	0.0320 (0.0360)
Perceived firm's interest in personnel development * employee survey	-0.0045 (0.0182)	0.0167 (0.0365)
Perceived firm's interest in personnel development * conduction of appraisal interview	0.0202 (0.0218)	-0.0139 (0.0378)
Perceived firm's interest in personnel development * staffing plan	-0.0338 (0.0231)	-0.0775** (0.0370)
Perceived firm's interest in personnel development * target agreements	0.0068 (0.0212)	-0.1191 (0.1734)
Perceived firm's interest in personnel development * participation in appraisal interview	0.0206 (0.0192)	-0.0098 (0.0339)
Perceived firm's interest in personnel development * work from home	0.1236 (0.1009)	0.0293 (0.0386)
Controls	yes	yes
Adjusted R ²	0.3336	0.1163
# Observations	8,469	8,469

Notes: Clustered robust standard errors at firm (OLS) and individual level (fixed effects) in parentheses.
 *significant at 10%, **significant at 5%, ***significant at 1%. Controls: age, schooling, female, children<14, in relationship, non-German national, big five, part-time, employment situation, gross pay, collective agreement, work's council, firm size, region, industry, participation in appraisal interviews, work from home, auditing, development plans, employee survey, conduction of appraisal interview, staffing plan, target agreement, average commitment of other firm employees, perceived fairness, year.

Appendix 4: Pearson correlations

	Affective Commitment	Participation in further training	Support for further training	Firm's training volume	Perceived firm's interest in personnel development	Age	Female	Non-German national
Affective commitment	1							
Participation in further training	0.1254***	1						
Support for further training	0.0987***	0.0801***	1					
Firm's training volume	0.0680***	0.1301***	0.1919***	1				
Perceived firm's interest in personnel development	0.4263***	0.2818***	0.1056***	0.1196***	1			
Age	0.2067***	-0.0566***	-0.0286	-0.0259	-0.0139	1		
Female	-0.0421***	-0.0054	-0.0366*	0.0121	-0.0399**	0.0008	1	
Non-German national	-0.0135***	-0.0105	-0.0273	-0.0166	-0.0203	-0.0593***	0.0184	1
In relationship	0.0971***	0.0336	0.0402**	0.0137	0.0388**	0.1895***	-0.0191	0.0049
Children < 14	-0.0200	0.0295	0.0027	0.0055	0.0202	-0.2710***	-0.0688***	0.0575***
Schooling	0.0125	0.1558***	0.0347	0.0575***	0.0581***	-0.0287	0.0370*	0.0246
Part-time	-0.0253	-0.0259	-0.0575***	-0.0060	-0.0357*	0.0640***	0.4839***	-0.0019
Gross pay (log)	0.2401***	0.2086***	0.1331***	0.1107***	0.2154***	0.1252***	-0.3839***	-0.0088
Employment situation	0.1366***	0.2161***	0.0274	0.0790***	0.1831***	0.0242	0.0568***	-0.0208
Participation in appraisal interview	0.1558***	0.2262***	0.1115***	0.1700***	0.3438***	-0.0564***	0.0086	-0.0170
Work from home	0.1283***	0.1449***	0.0209	0.0174	0.1272***	0.0461***	-0.0702***	-0.0100
Perceived fairness	0.4542***	0.1168***	0.0566***	0.0661***	0.4718***	0.0497***	-0.0389**	-0.0044
Work's council	0.1108***	0.0719***	0.1388***	0.1273***	0.0786***	0.0316	-0.0803***	-0.0028
Collective agreement	0.0716***	0.0408**	0.1223***	0.0477***	0.0693***	0.0145	-0.0600***	-0.0209
Auditing	0.0271	0.0193	0.0960***	0.0561***	0.0250	0.0144	-0.0719***	0.0055
Development plans	0.0865***	0.0809***	0.2656***	0.2189***	0.1483***	-0.0051	-0.0750***	-0.0015
Employee survey	0.0593***	0.0794***	0.1420***	0.1594***	0.1178***	-0.0232	0.0037	-0.0245
Conduction of appraisal interview	0.0576***	0.0800***	0.1999***	0.1555***	0.1231***	-0.0601***	-0.0342	0.0025
Staffing plan	0.0830***	0.0671***	0.2476***	0.1649***	0.0904***	0.0000	-0.0420***	-0.0047
Target agreement	0.0299	0.0908***	0.2405***	0.1508***	0.1066***	-0.0248	0.0127	0.0264
Average commitment of other firm employees	0.1606***	0.0839***	0.1917***	0.1315***	0.1578***	0.0135	-0.0599***	-0.0332

	In relationship	Children > 14	Schooling	Part-time	Gross pay (log)	Employment situation	Participation in appraisal interview	Work from home
Affective commitment								
Participation in further training								
Support for further training								
Firm's training volume								
Perceived firm's interest in personnel development								
Age								
Female								
Non-German national								
In relationship	1							
Children < 14	0.1973***	1						
Schooling	0.0380**	0.0761***	1					
Part-time	0.0300	0.0529***	-0.4165***	1				
Gross pay (log)	0.1217***	0.0373*	0.3566***	-0.4165***	1			
Employment situation	0.0728***	0.0449***	0.3948***	0.0231	0.3844***	1		
Participation in appraisal interview	0.0394**	0.0386**	0.1903***	-0.0081	0.2626***	0.2344***	1	
Work from home	0.0855***	0.0789***	0.3541***	-0.0504***	0.4032***	0.3858***	0.1871***	1
Perceived fairness	0.0266	0.0072	0.0228	0.0030	0.2264***	0.0999***	0.2026***	0.0820***
Work's council	0.0428***	0.0139	0.0560***	-0.0258	0.3017***	0.0426***	0.1643***	0.0632***
Collective agreement	0.0339	0.0011	0.0138	-0.0122	0.1821***	-0.0203	0.1016***	0.0175
Auditing	0.0193	-0.0135	-0.0265	-0.0458***	0.0563***	-0.0418***	0.0403**	0.0057
Development plans	0.0143	0.0157	0.0413***	-0.0312	0.1646***	0.0141	0.2490***	0.0518***
Employee survey	0.0244	0.0017	0.0286	0.0421***	0.0434***	0.0170	0.1896***	0.0079
Conduction of appraisal interview	0.0201	0.0090	0.0260	0.0022	0.1080***	0.0166	0.2683***	0.0636***
Staffing plan	0.0337	0.0022	0.0216	0.0032	0.1213***	0.0135	0.1499***	0.0135
Target agreement	0.0052	0.0115	0.0436***	0.0241	0.1260***	0.0590***	0.2218***	0.0769***
Average commitment of other firm employees	0.0557***	-0.0122	0.0337	-0.0304	0.2165***	0.0358*	0.1369***	0.0642***

	Perceived fairness	Work's council	Collective agreement	Auditing	Development plans	Employee survey	Conduction of appraisal interview	Staffing plan	Target agreement	Average commitment of other firm employees
Affective commitment										
Participation in further training										
Support for further training										
Firm's training volume										
Perceived firm's interest in personnel development										
Age										
Female										
Non-German national										
In relationship										
Children < 14										
Schooling										
Part-time										
Gross pay (log)										
Employment situation										
Participation in appraisal interview										
Work from home										
Perceived fairness	1									
Work's council	0.1109***	1								
Collective agreement	0.1220***	0.3616***	1							
Auditing	0.0264	0.0744***	0.0550***	1						
Development plans	0.1213***	0.2384***	0.2529***	0.1714***	1					
Employee survey	0.0878***	0.1452***	0.1480***	0.1572***	0.3218***	1				
Conduction of appraisal interview	0.1028***	0.1486***	0.1068***	0.1481***	0.3776***	0.3137***	1			
Staffing plan	0.0856***	0.3107***	0.2209***	0.1722***	0.4048***	0.2298***	0.2983***	1		
Target agreement	0.0780***	0.1973***	0.1419***	0.1152***	0.2867***	0.2253***	0.3839***	0.2741***	1	
Average commitment of other firm employees	0.1775***	0.2100***	0.1209***	0.0287	0.1628***	0.0992***	0.1013***	0.1521***	0.0581***	1

Notes: *significant at 10%, **significant at 5%, ***significant at 1%. We use the Pearson correlation in order to make the coefficients comparable, although a measure of association for two binary variables is the Phi coefficient. However, a Pearson correlation estimated for two binary variables will return the phi coefficient (see Guilford 1954), such that there are no significant differences between the coefficients.