The role of supervisors in further training.

Bringing the boss back in!

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1. Introduction

Direct supervisors play an important role in firm-internal decision procedures. In the top-down information flow they implement management decisions, in the bottom-up process they are the first contact in cases of job dissatisfaction, promotion matters, or further training. They have to recognise and to detect individual learning needs and uncertainties, but they are also 'gate keepers' for an often limited further training budget. Direct supervisors have a ‘sandwich-position’ between employees and top management. They have to balance employees' needs and firm needs, and should consider training leaves and team's work load simultaneously. During the last years, their role became even more important due to new responsibilities with regard to employee’s performance talks and performance-related wages. For most supervisors, these tasks are at least challenging and in many cases they need more support and instruction for their ‘job’ as skill and training manager. Often they do not have the training, resources and time for an evaluation of further training in their working group and a structured training plan.

Nevertheless, they fulfil an important role in strengthening participation in further training and skill development. For the members of their working team, they are often the first contact person in all training-related issues. Since the further training system is quite complex, especially older employees and those with lower education levels often act under constraints of 'bounded rationality’ (Simon 1955); they cannot decipher all of the complexity of their decisions and are unable to grasp all relevant factors of a training decision. However, without some certainty about potential consequences of their training decisions, it becomes difficult for many people to estimate subjective expectations of further training. Lower educated employees are often stuck in a 'certainty-difficulty gap' (Heiner 1983) which is hard to solve. In comparison to their higher skilled colleagues they often have less knowledge about the further training

system, possible long term benefits and future skill needs. To some extent, this also applies for older employees who might have difficulties to assess technological innovations and potential consequences for their work place.

In such situations of uncertainty, direct supervisors can give some orientation. They can help to overcome potential doubts about own training competencies and can send clear signals concerning the importance of further training, which might influence employees' training behaviour (Tracey & Tews 2005). Indeed, Maurer (2001) and Baron and Schömann (forthcoming) showed that especially for older and lower skilled employees direct supervisors can help to strengthen confidence in own training competence, which is an important precondition for future training participation. And Birdi et al. (1997) showed a clear positive influence of learning motivation and management support on training participation. Thus, supervisors can motivate and coach their fellows, but it is obvious that they can also deter them from training participation by giving less support, encouragement or flexibility to engage in further training. Especially in larger teams or those with frequent fluctuations, it might be quite difficult to assess the real capabilities or training needs of every single employee. In absence of this information direct supervisors might follow the widespread age and education stereotypes and discriminate against their older and less educated colleagues. Both groups are often perceived to learn slowly, be inflexible, or show poor training performance. Hence, supervisors might prevent them from training, although they need their special support.

In face of these findings, we argue in favour of 'Bringing boss (back) into' research (Baron and Bielby 1980). It is our aim to examine in detail, which factors influence a supervisor's opinion on individuals' willingness to train. In other words, how do supervisors decide whom to support. We are interested in the question, whether these

opinions differ for the mentioned focus groups in comparison to their younger and/or higher skilled colleagues, which might have consequences in different supervisor support in further training and, as a consequence, in different training participation rates. We assume that both groups become disadvantaged in the daily work life, whether or not intended by their supervisors and the firm.

Although direct supervisors play such an important role in intra-firm (training) strategies, they are seldom in the focus of labour market policies. Research focuses more on either employees (i.e. GSOEP, Adult Education Survey) or the firm context (i.e. IAB Establishment Panel), but the 'black box' of supervisors' effects on selection for training participation is rather unexplored. In our paper, we provide a step towards closing this gap using multilevel data collected within the interdisciplinary demopass project at the Jacobs Center on Lifelong Learning and Institutional Development. This gives us the unique chance to analyse cross-level interactions between supervisors and their team members using multilevel logistic regression analyses.

The remainder of this paper is as follows: In section 2 we give an overview about the theoretical mechanisms of screening and signalling, before we describe our data set, variables and methods in section 3. In section 4, we discuss the results of our two-level logistic regression analysis and section 5 provides a conclusion and an outlook on further research.

2. Screening and signalling in internal labour markets

From our point of view, there is no doubt that screening occurs in internal labour markets. Although supervisors are confronted with a sheer amount of information, they often miss relevant information on individuals' real skills, willingness to train, productivity and further training expectations. Supervisors cannot be sure of the learning capabilities of an individual, but they can observe plenty of personal data in the

form of easily observable characteristics and attributes. Gender, age, education or migration background may be applied as screening devices for filtering employees for different abilities. Supervisors who seek to maximize performance or expected profit might discriminate against employees if they believe them to be less qualified (cf. Arrow 1971, Phelps 1972, Spence 1973). They often use previous experiences with individuals with the same educational background for their decisions, or they judge on the basis of average characteristics of the group. Often, information simply stems from prevailing beliefs or stereotypes. Hence, they do not discriminate against single individuals, but against a whole group of employees with common characteristics. For this sort of statistical discrimination, England and Lewin (1989, 1992) suggested the term 'error discrimination' to describe actions of supervisors who underestimate the average abilities of a group and, based on these false expectations, are less willing to support group members in their training efforts. In the case of further training, the error about group differences might entail that men and women, or younger and older employees differ in their further training ability, when in fact no differences exist. The results of research on plasticity over the life span, for example, showed that the majority of healthy older adults are able to improve their performance after a few sessions of training or practice (Baltes et al. 2006). Thus, employees with a higher training willingness or ability than the average of their group are victims of error discrimination.

Especially higher education serves without doubt as a screening device in further training, in that it sorts out individuals of different abilities. Education has a quite high information value, because of its high probability for a fit between expectations and actual performance (Seibert/Solga 2005). First, one expects strong self-selection processes. It is a common result in social research, that employees often have a stronger incentive to avoid downward social mobility than to pursue upward mobility (cf. Breen/Goldthorpe 1997, Need/de Jong 2001). Employees with high educational

background try to maximize the chances to hold their job status, whereas employees with a medium educational background try to avoid a status decline and those employees with only a low educational background have no or only small incentives. In comparison to their higher skilled colleagues, they have no or only a small risk for status decline. Their jobs can be done with any kind of educational degree, often also without any degree. Additionally, employees with advantaged educational background often also show a higher learning ability, because cultural and economic resources of their social background can give a 'push' towards more training (Gambetta 1987), give orientation, and facilitate a better insight into general perspectives of the labour market.

Second, supervisors and their firms rely on the educational system and its filtering function for the labour market. Schools, universities and the vocational system have enough time to observe pupils' educational ability, competencies and other attributes; and sort them into different education tracks accordingly. To sum up, educational attainment and time spent in education often serve as a proxy for higher educational motivation or productivity (Riley 1976), as well as for positive characteristics like stronger sense for responsibility or reliability (Graff 1996). Direct information about these characteristics would be quite difficult and expensive to acquire. However, in general, from the supervisor's viewpoint an individual certified to be more valuable is more valuable. Thus, screening might have productivity returns, but it definitely tends to manifest the persistent inequality in the employment market (Stiglitz 1975). Those employees who are already in a worse position in the labour market tend to receive less employer-sponsored training, leading to worse career prospects, lower wages and less employability (Lassnigg 2007), and employees with already high educational background tend to receive more and more education ('Matthew-Effect'). The discussion can be summarized in our **first hypothesis**, namely that supervisors filter their fellows using the guideline of educational certificates as a proxy for the actual

willingness to train. Higher educated employees are expected to be more prepared for training participation than their lower educated colleagues.

Of course, it is also reasonable to argue that employees with higher self-perceived willingness to train have an interest to spend resources to provide their supervisors with this information (Stiglitz 1975, Riley 1976). This might lead to a self-selection process, which brings employees with higher self-perceived willingness to the attention of their supervisors, and this will sort out colleagues with lower willingness to train. They may bridge the 'structural hole' (Burt 1992, 1997) between supervisors and employees and might profit from this position within the firm's social network by having higher supervisor support and better promotion chances. However, higher self-ratings relative to the ratings of others might also have the problem of social desirability. Empirical studies have shown that employees who provided inflated self-ratings are in fact poorer performers (cf. Atwater et al. 1998). This fact might even increase supervisors' uncertainty about individuals' real willingness to train. Hence, in our **second hypothesis** we assume that educational screening by supervisors mainly occurs for employees who provide a higher self-rating compared to others in the working team.

Still, screening for age, gender, or migration background may be even more discriminating than education. In contrast to education as an alterable signal in which employees can invest over their life course, Spence (1973) has defined age, gender and migration background as fixed attributes or indices. All three groups, elderly, women and migrants, are often afflicted with stereotypes and have only some minor chances to overcome these patterns. Many supervisors have an implicit or explicit 'taste for discrimination' (Becker 1971) and are prejudiced against members of the mentioned groups. We already mentioned the well-known age stereotypes. Additionally, employers' taste for discrimination against women might stem from the apprehension

that women have more difficulties in balancing career and family than their male colleagues. They may argue that time-insensitive family responsibilities are only hardly compatible with further training efforts. Furthermore, discrimination against migrants and a stronger supervisor's preference for native fellows can mainly be explained by an ethnicized expectation of employees' performance. In many cases, they assume lower language skills, learning competence, social skills, as well as a lower work ethic in terms of punctuality or effort (Seibert/Solga 2005). However, besides this theoretical assumption, we do not expect any significant effect for migration status and gender. Any possible discrimination of migrants would almost disappear when controlling for education and our data sample also shows no distinct job segregation of migrants. Instead, they are integrated on different educational levels and are not expected to differ from their native colleagues. Additionally, gender differentiations mainly result from occupational characteristics, hence, within the same firm and working group women are not expected to differ from their male colleagues. Nevertheless, we expect in our **third hypothesis** that age still plays a role in firm-internal screening processes. Missing real information, supervisors follow established age stereotypes and have lower opinions on older colleagues' willingness to train.

To sum up, supervisors may be subject to leniency (Schriesheim et al. 1979) and favour simply their 'in-group' at the expense of other groups in terms of own evaluation or supervisor support (cf. Becker 1971). Previous research by Dasgupta (2004) and others clearly reported people's tendency to associate positive attributes with colleagues of same age or education more easily than with out-groups, and the other way round, to associate negative characteristics more easily with out-group members than with members of the same group. Thus, our **fourth hypothesis** based on the discussion above would be that screening effects should vary between in-group and out-group fellows. Whereas positive screening effects become strengthened for in-group members,

discrimination becomes more likely for out-group members.

Of course, implicit beliefs and stereotypes are omnipresent in the daily work life. However, as we argued above, these prejudices might be especially prevalent in large working teams or groups with frequent fluctuations. In smaller working teams with less personnel fluctuations supervisors might have the opportunity to learn more about the true capabilities of their team members. Therefore, we will finally test our **fifth hypothesis**, namely that smaller team size and longer joint duration of supervisor-employee relationship decrease potential screening effects.

3. Data, Operationalization, and Methods

We tested our hypotheses with data from the interdisciplinary demopass-project, a joint research project situated at the Jacobs University Bremen. The ambition of this project was to detect effects of matches and mismatches between aspects of human and social capital, corporate strategy and work organization on the physical and mental well-being of employees. The project includes and combines the five thematic sub fields further training, age climates, knowledge management, health, and adaptivity (Schütz et al. 2008, Heidemeier et al. 2009). Our data set provides a new and unique opportunity for analysing multilevel effects of individual characteristics and supervisors in one model.

We collected information on further training expectations and experiences in two firms of the supply- industry of the automobile sector in Germany and one firm of the finance sector. Further training was defined as any job-related continuation or renewal of organized learning after completion of an initial occupational training. This broad definition comprises internal training at the workplace as well as external training, and makes no differentiation between formal and informal training. Within each firm working teams were selected and all working group members were asked to complete a

questionnaire on a voluntary basis. Their direct supervisors completed a similar questionnaire. Altogether, 742 individuals clustered within 76 working teams completed our questionnaire. We dropped working groups with less than four members and lost some cases due to item non-response and denied supervisor interviewers. Therefore, our final models presented in this paper include data from 595 employees nested in 67 teams.

Table 1: Descriptive statistics

	Min/Max	Mean	SD
Low education (no degree/Hauptschule)	0/1	0.16	0.37
Medium education (Realschule)	0/1	0.35	0.48
High education (Abitur/University degree)	0/1	0.49	0.50
Age	21/62	38.93	8.61
Gender (1=female)	0/1	0.27	0.44
Migration background (1=Yes)	0/1	0.14	0.35
Previous further training/last 12 months	0/1	0.47	0.50
Positive Affectivity	1/5	3.03	0.59
Perceived importance for further training	1/5	4.04	0.71
Perceived direct and indirect costs	1/5	2.78	0.86
Supervisor: Low education	0/1	0.08	0.28
Supervisor: Medium education	0/1	0.26	0.44
Supervisor: Higher education	0/1	0.66	0.47
Supervisor: Age	31/57	43.52	5.63
Supervisor: Gender (1=female)	0/1	0.06	0.23
Supervisor: Attitude towards further training	1/5	4.16	0.98
Supervisor: Benefits from further training	3/10	8.21	1.44
Supervisor: Evaluation of job performance	1/7	5.25	1.21
Team size	4/186	28.22	34.62
Joint duration of supervisor-employee relationship/years	0.08/17	4.96	3.60

93 percent of the employees in our sample were employed as full-time workers with a permanent working contract, 23 percent were blue-collar workers. 49 percent of our participants obtained Abitur or received a university degree, 16 percent had a low educational level. 47 percent participated in further training during the last 12 months, 14 percent had a migration background, 27 percent were female, and the mean age was 39 years (see table 1 for detailed descriptive statistics).

3.1. Operationalization

For each employee we asked supervisors to rate how willing she/he is to train. Ratings were given on a 5-point scale from 1 'Very good' to 5 'Inadequate'. Additionally, employees answered five learning goal orientation items from Button and Mathieu (1996, please see appendix A for a complete list), which were averaged to form a single score for subjective willingness to train (α=0.81). Based on these two items we created a typology of fit between supervisor's opinions on willingness to train and employees' self-perception. Therefore, we centered both variables on the group mean, because we were mainly interested in the relative standing within the work group and people often tend to consider as relevant only the standards of the other people in their group (cf. Burstein 1980). Figure 1 depicts this set of fits, which we used as structure for employing a multinomial logistic regression in order to model the supervisors' decision process.

Figure 1: Fit/Misfit in training willingness expectations

Self-rating on willingness to train (Group mean)	Supervisor's rating on willingness to train: + (Group mean)	Supervisor's rating on willingness to train: - (Group mean)
+	Positive fit	Under-estimation of team members
-	Over-estimation of team members	Negative fit

The two fields on the left hand side are of special interest for our research question. In both fields, supervisors rate employees' willingness to train higher than the group mean, but the fields differ in employees' own opinions on willingness to train. While in

the upper left field as a positive and effective fit both supervisor's and self-ratings are high, employees feel less willing to train in the lower left field (Over-estimation of employees). Hence, we are able to analyse potential influences on supervisors' opinions, while holding employees' expectations constant. To conclude, the lower field on the right hand side shows a negative fit: here, employees show a lower learning goal orientation than the group mean, and their supervisors subscribe to that view. Finally, the upper right field (Under-estimation of employees) host all employees with a higher self-perceived learning goal orientation, but lower expectations by their supervisors.

We included several independent variables to capture potential screening devices: educational background, age, gender, migration background, and previous further training during the last 12 months. Due to our data structure, we decided to include a dummy variable for education. Employees with low and medium education constituted the reference category for their higher educated colleagues who hold at least 'Abitur'. We decided to center employees' age on the group mean, because we were mainly interested in the screening effect for employees above team's mean age. We checked for possible non-linear effects, but the relationship proved to be linear. A dummy item is used to differentiate between men and women, as well as between employees with and without migration background. Employees with at least one parent born in a foreign country outside Western Europe were coded as migrant. Another dummy variable distinguishes between non-participants and participants in further training during the last 12 months.

To control as much as possible for unobserved variance in employees' self-ratings, we also introduced information on positive affectivity, employees' expectations on the importance of further training and related direct and indirect costs. Burke et al. argued in 1993 that self-reports of positive aspects of work context might be influenced by

positive affectivity. Hence, we used the mean of 10 items for positive affectivity taken from Kessler and Staudinger (2009). For example, employees were asked to rate how often during the last weeks they felt at work 'euphoric', 'relaxed' or 'full of élan'. To capture perceived importance of further training participation, we asked the participants in our survey for a rating of different goals, which might be important reasons for a participation in further training. The original items were taken from the German Socioeconomic Panel (GSOEP) (Wagner et al. 2007) which we supplemented by a 5-point scale. Responses to eight items were averaged to form a single score for perceived training importance. For the assessment of expected costs we used an index of six items from the German 'Berichtssystem Weiterbildung IX' (Kuwan et al. 2006), measuring both direct and indirect costs of further training. On a five-point scale, employees were asked for their agreement with several potential reasons for non participation. For all listed control variables, appendix A lists the underlying items.

Of course, the size of screening can be also influenced by supervisors' characteristics. Hence, we included information on supervisors' educational background, age, and gender into our analysis. We did not use the direct information of education and age, but included dummy items for common group belonging (1=same age/education group). Supervisors and fellows with an age difference of less than 5 years defined the common age group. Furthermore, we controlled for supervisors' attitude towards further training and their evaluation of potential benefits from further training for the firm. For the former, we used a single item in which supervisors are asked if they can agree with the statement that 'it is taken for granted that employees always apply new knowledge and skills'. Answers ranged from 1 'Do not agree' to 5 'Agree'. The single item was adapted from the General Training Climate Scale (GTCS) by Tracey and Tews (2005). For the measurement of potential benefits, we included a single item and answers ranged from 0 'No benefit' to 10 'High benefit'.

Finally, we included supervisors' rating of overall job performance, joint duration of supervisor-employee relationship and team size as additional control variables. For the latter we used the information on real team size given by the supervisors, instead of the smaller number of survey-participants nested in working teams. While we centered team size on the grand mean, we again decided to center supervisors' rating of job performance and the information on joint duration on the group mean. Especially supervisors' judgements on job performance are always relative to the average of the group, they tend to consider as relevant only the standards of the other fellows in their working group (Davis 1966, Gambetta 1987).

3.2. Method of analysis

As aforementioned, we employed multinomial logistic regression models (MLM) with two levels to model supervisors' decision processes. This method allows us to estimate the likelihood for a positive supervisor evaluation by incorporating the influence of employees' self-perceived learning goal orientations (cf. Schimpl-Neimanns 2000, Breen & Jonsson 2000, Long & Freese 2003). We restricted our analysis to the three most interesting relationships between an underestimation of team members and a positive fit, a negative fit and a positive fit, as well as between negative fit and an overestimation of team members. The first two relationships describe the likelihood to end up in a positive fit between self-rating and supervisor rating. From our point of view, effectiveness of further training is highest for employees ending up in this field. However, we are also interested in determinants for a positive supervisor rating for those employees showing a lower self-rating than their team colleagues. With regard to the role of supervisors in strengthening further training, these results might be even more important.

Unfortunately, multinomial logistic regression models do not allow for the correct

estimation of interaction effects. Ai et al. (2003) and Norten et al. (2004) argued that interaction effects are complicated to interpret in all non-linear models, because interaction effects would require computing cross derivative of the expected value of the outcome variable. Additionally, a test for significance must be based on the estimated cross-partial derivative; a test based on the coefficients of the interaction term would be misleading. Fortunately, Norten et al. (2004) have developed the inteff-routine for STATA, which can deal with the mentioned problems for binary logit models and provides corrected coefficients and standard errors for interaction effects. Thus, we decided to use four binary models for testing the likelihood for getting a better supervisor rating versus a poorer rating. First, we employed a logit model for all employees in our sample, in a second step we split up the sample in those having a higher self-rating on further training willingness and those having a lower self-rating. Finally, we tested a fourth model for transitions between a negative fit and a positive fit. All together, we tested interaction effects between employees' age and educational background, as well as for interaction effects for both variables with team size.

4. Empirical findings

It was our aim to analyse, which factors influence supervisors' opinions on individual willingness to train of their team members. We argued that supervisors' responsibility in firm internal training increases and that they become more and more a training manager. However, we also expected that supervisors often do not have the resources, time and training for this challenging task. They often have to decide about their team members' potential training measures, without having full information about their real training capabilities. In many cases they may draw their decisions from easily observable characteristics and attributes.

Indeed, our findings provide clear support for our hypotheses on firms' internal

further training practice. In accordance with our hypotheses, table 2 shows that signalling effects of higher education and age strongly correlated with supervisors' opinions on willingness to train. The chances for ending up in a positive fit, namely to get a better supervisor-rating while also having a higher self-perception on own willingness to train, were around two times higher for higher educated employees than for their colleagues with at most a degree from German 'Realschule'. Although we could not test whether there is real discrimination ongoing, our results seem to underline the manifest 'Matthew-effect' in the educational system, namely that educational attention will usually be given to employees who are higher educated and often already participated in further training. Hence, it is obvious that supervisors' screening of team fellows may increase educational inequality.

But what are the real rationales behind the supervisors' opinions? Do they think in terms of productivity, that a rationale person would be only willing to train if the expected rate of return were greater than the expected costs (Becker 1964)? As Kenneth Arrow argued in 1973, the filtering role of education might be a productivity-adding role from the viewpoint of a supervisor, or in John Riley's words (1976), educational attainment may signal information about employees' productivity. Or do they have real prejudices against lower skilled team members, or in other words, a taste for discrimination? To answer this question, we added supervisors' rating of overall job performance to the model. Not very surprising, the coefficients showed the expected positive direction. Employees with higher performance ratings had also a higher likelihood for a positive assessment of their training willingness by their supervisors. Even more interesting, also under control for evaluation of job performance, the effects for educational background remained stable. Since we also controlled for potential in-group effects, we can conclude that the filtering function of education itself has a high impact on the likelihood for ending up in a positive fit or not.

Thus, supervisors have stereotypes against lower skilled employees who have self-ratings above the team average. Of course, from the supervisor's point of view, employees with higher willingness to train can be in fact poorer performers. However, this can be also true for higher educated employees. Thus, the results for educational background in the first two columns may be interpreted as additional filtering function of the supervisor. We take it for granted that employees with higher self-perceived willingness to train provide their supervisors with this information, but higher willingness to train does not necessarily correlate with higher training effectiveness and capability. To avoid this uncertainty problem, supervisors might follow well-known stereotypes for assessing their opinions on the training capability of their team fellows. They rely more on the efficiency of higher educated employees than of those with lower education.

Now, one could argue that the joint duration of supervisor-employee relationship might level out existing stereotypes, because with a longer joint duration, supervisors may use more directly obtained information on training willingness for their judgements. We reported the coefficient for joint duration in table 2, but an interpretation of the mean effect by holding all other factors constant is quite misleading. Instead, we tested for an interaction between joint duration of supervisor-employee relationship and educational background using a binary logit model. Interestingly, the results (please see Appendix B 2) did not show any significant effect of longer joint duration on educational discrimination.

However, educational background lost its significant signalling effect for employees with self-ratings below the team mean. For those employees, social desirability effects play no role; instead they might show lower willingness to train due to their lower training self-efficacy. Maurer (2001) defined learning self-efficacy as the belief of people that they are capable of improving and developing their skills, and Bandura

(1986) could show that people are more likely to engage in tasks or behaviours if they expect to perform successfully. In such situations with lower perceived willingness to train, supervisors can compensate for potential doubts.

They can motivate and give orientation for overcoming potential certainty-difficulty gaps in further training system. However, it is an important precondition for higher supervisor support that supervisors recognize employees' willingness to train. Team members who are rated as less willing to train often receive less support by their supervisors and management. In this context, our results were in some way multifaceted. On the one side, the chances to end up in a positive fit decreased slightly with each year of age. On the other side, employees within the same age group as their supervisor had a more than two times higher chance to get a positive rating by their supervisors than employees from different age groups. Since that was our only significant in-group effect, we cannot confirm our general assumption that supervisors associate positive attributes more likely with colleagues of same in-group. The strong effect can be rather explained by the low self-perception of the described subgroup, and that supervisors are even more aware of real capabilities than their fellows themselves. Perhaps, it is also a simple reference group effect, namely that people from same age group know each other much better than colleagues from other groups and that they therefore have some positive prejudices or even better information about real capabilities.

Additionally, the results in table 2 showed clear age effects. It is quite embarrassing that age stereotypes seem to be prevalent in firm internal further training strategies– independent from employees' self-ratings on their willingness to train and after controlling for the evaluation of overall job performance.

Table 2: Determinants for positive supervisor rating on willingness to train, estimated with multinomial logistic regression

	Field 2 → Perfect fit		Field 3 → Perfect fit		Field 3 → Field 4	
	e^b	b (s.e.)	e^b	b (s.e.)	e^b	b (s.e.)
High education (Ref. Low education)	**2.38**	0.87 (2.90)**	**1.92**	0.65 (2.40)**	1.31	0.27 (0.71)
Age	**0.96**	-0.05 (-2.40)*	**0.94**	-0.06 (-2.88)**	**0.90**	-0.11 (-5.83)***
Gender (1=female)	1.10	0.10 (0.31)	1.01	0.01 (0.04)	1.01	0.01 (0.02)
Migration background (1=Yes)	0.72	-0.33 (-0.82)	1.01	0.01 (0.01)	0.97	-0.03 (-0.06)
Previous further training/last 12 months	1.10	0.09 (0.32)	1.07	0.07 (0.20)	1.24	0.21 (0.70)
Positive Affectivity	0.78	-0.24 (-0.88)	1.29	0.25 (1.04)	0.76	-0.27 (-1.33)
Importance for further training	0.97	-0.03 (-0.13)	**2.58**	0.95 (5.07)***	1.03	0.03 (0.17)
Direct and indirect costs	0.83	-0.19 (-1.13)	**0.61**	-0.49 (-3.25)***	0.86	-0.16 (-1.08)
Supervisor:						
- Same educational background	0.71	-0.34 (-1.10)	0.64	-0.45 (-1.55)	0.74	-0.30 (-0.79)
- Same age group	0.70	-0.35 (-1.24)	1.07	0.07 (0.28)	**2.14**	0.76 (2.62)**
- Gender (1=female)	1.76	0.57 (0.97)	1.05	0.05 (0.06)	0.55	-0.60 (-0.78)
- Attitude towards further training	0.82	-0.20 (-1.38)	0.83	-0.18 (-0.99)	0.87	-0.14 (-0.75)
- Cost-benefit ratio of further training	1.04	0.03 (0.31)	1.08	0.07 (0.56)	0.965	-0.04 (-0.34)
Evaluation of job performance	**2.10**	0.74 (5.53)***	**2.28**	0.82 (6.17)***	**2.29**	0.83 (6.66)***
Joint duration	**0.88**	-0.13 (-2.47)**	**0.84**	-0.17 (-3.46)**	0.91	-0.10 (-1.52)
Team size	**1.07**	0.07 (1.84)*	1.06	0.06 (1.43)	1.05	0.05 (1.00)
Pseudo-R^2				0.17		
N				595		

*p<0.05, **p<0.01, ***p<0.001. Z-values in parentheses. Controlled for firms. Significant Odd Ratios in bold text.

The single effect per year might be small, but the cumulative effect has clear consequences for lifelong learning. The chance for a positive supervisor rating and therewith the chance for higher supervisor support decrease with each year of age. In the reverse argumentation, the results depicted the clear pattern that older employees above the team's mean age have a significant higher risk to get a poor supervisor rating. Sure, older employees beyond a certain point of age are in fact less willing to train. Shortly before retirement they do not see any need for additional training. However, for older employees with self-ratings above the team average, our results gave some evidence for existing implicit or even explicit age stereotypes in firm-internal further training. With regard to this finding, supervisors should rethink their attitudes towards older colleagues. They have to keep in mind that older employees are affected by a reduced speed of information reception, a reduced ability to react and an increased risk for jobs under time pressure, but that they also dispose of higher grades of crystallized intelligence like discernment and a higher capability for integrative thinking. Age alone does not predict the level of functioning. Rather, intelligence allows successful adaptations to the new environment and future challenges. Already Cicero argued that old employees have mind, sense and wisdom.

Furthermore, it is not very surprising that employees' perceptions for potential training benefits and costs highly interact with their self-rating on willingness to train. It was already Gary Becker (1964) who argued that in general individuals are more likely to participate in training, if they perceive higher benefits and lower costs. Indeed, the results of the second column in table 2 clearly show that the likelihood for a transition from a negative fit to a positive fit strongly increased with higher perceived benefit from training participation, but decreased with higher cost expectations.

Finally, the positive effect of team size was rather low and only significant for transitions from an underestimation of team members to a positive fit, namely for the

chance to get a positive supervisor rating while having a high self-perception. Again, an interpretation of the mean effect of team size by holding all other factors constant is quite meaningless. Instead, as formulated in our fifth hypothesis, a meaningful interpretation of team size makes only sense with regard to its effect on discrimination pattern we have described in this paper. Thus, following this argumentation we tested whether smaller team size decreases the mentioned screening effects and the answer is negative. No single interaction effect in our binary logit models showed any significance (please see appendix B for all models). We can conclude that smaller team size have no reducing effect on the screening effects of age and education. Additionally, we also tested for potential interaction effects between age and educational background, but these effects also missed any significance level. However, the results of our logit models confirmed the results of our previous multinomial logit model.

5. Conclusion

It was the aim of our paper to ask for potential factors influencing supervisors' opinions on the individual willingness to train of their team fellows. In a previous paper (Baron/Schömann, forthcoming), we showed that supervisors fulfil an important function in firm-internal further training strategies. They are not only gatekeepers and promoters of further training courses, they can also give orientation especially to those with less further training experiences. For older employees and those with less education, supervisors can help to overcome potential doubts in own training competencies, which is an important precondition for future training participation.

However, in our research done for this paper, we confirmed the well-known function of education as screening-device, which seemed to provide clear signals about employees' willingness to train. The chances for higher educated employees to get a positive supervisor rating on willingness to train were around two times higher than the

chances for their lower educated colleagues. Of course, the odds to end up in a perfect fit also depend on employees' self-ratings and potential social desirability effects. For colleagues with lower self-ratings, education showed no significant effect for the chance to get a positive supervisor rating. Additionally, we detected well-known age stereotypes, which may follow the popular belief that ability to learn decreases with age; older employees are often perceived to learn slowly, be inflexible, or show poor training performance. The coefficients were small, but their cumulative effect has a high importance for 'silver' workers. Only one significant in-group effect was found in our research. Employees with lower self-perception had a significant higher chance for a positive supervisor rating if they belonged to the same age group like their supervisor.

From our point of view, the results are of special importance, because we showed that supervisors have lower opinions on willingness to train for groups who need in fact more support to attain the same training gains like their younger and higher educated colleagues. Thus, a rethinking concerning possible education and age discrimination is important for future further training enhancements, as well as an involvement of supervisors into further training planning.

Our findings provoke some additional thoughts. It was the starting point of our analysis that firm-internal screening might be explained by over-challenged supervisors with a lack of information about real learning capabilities of their team fellows. Hence, smaller team size and a longer common job experience might lower potential screening effects. However, our results showed that smaller team size and a longer joint duration of supervisor-employee relationship do not have a positive effect for the disadvantaged employees.

Some questions remained unanswered. We were first not able to include other socio-cultural resources that also might influence supervisors' opinions. The strong effect for

evaluation of job performance shows that supervisors are also led by an overall picture of their team fellows. Second, our sample was restricted to employees and working teams of only three firms and can give only a first insight into the issue. A larger representative sample would be desirable, but such hierarchical data is very hard to collect in firms.

Nevertheless, our demopass data set gives at the moment a unique opportunity to test our hypotheses. The results reveal clear stereotypes and can therefore give clear recommendations for further training enhancements. For effective further training, firms should try to assemble as many employees as possible in a perfect fit between employees and supervisors. From a positive fit, very positive outcomes should result, i.e. higher productivity and better performance (cf. Atwater et al. 1998). In practice, scheduled employee supervisor talks once a year have proven to be valuable tools to achieve a better fit. However, from our point of view, a higher responsibility for an agreement rests with the supervisors. They have to support team fellows with lower self-perception and should not discriminate against older employees and those with lower education who show high willingness to train.

Appendix:

A: Overview of Survey Items

Learning goal orientation (Button & Mathieu 1996):

1. The opportunity to do challenging work is important to me.
2. The opportunity to learn new things is important to me.
3. I try hard to improve on my past performance.
4. The opportunity to extend the range of my abilities is important to me.
5. When I have difficulty solving a problem, I enjoy trying different approaches to see which one will work.

Reasons against further training, adapted from BSW IX (Kuwan et al. 2006)

1. If I have to give leisure time.
2. If it is exhausting.
3. If there are no offers nearby.
4. If it entails costs or loss of earnings.
5. If I have no time due to job obligations.
6. If I have no time due to family obligations.

Positive affectivity, adapted from Kessler & Staudinger (2009)

1. Relaxed	2. Full of élan	3. Serene	4. Excited
5. Resting in oneself	6. Euphoric	7. At ease	8. Delighted
9. Relieved	10. Elated		

Reasons for further training participation, GSOEP 2004 (Wagner et al. 2004)

1. To get a professional degree
2. Retraining for different job
3. Brush up professional skills
4. Adjust to constant changes in the job
5. Receive more qualifications for further career
6. New subjects for more flexibility
7. Individual development
8. More job security

Appendix B 1: B-coeff. for positive supervisor rating on training willingness, estimated with binary logit regression

	(1)		(2)		(3)		(4)		(5)	
High education (Ref. Low education)	0.58**	(0.22)	0.61**	(0.22)	0.60**	(0.22)	0.61**	(0.22)	0.60**	(0.22)
Age	-0.07***	(0.02)	-0.07***	(0.02)	-0.07***	(0.02)	-0.07***	(0.02)	-0.06**	(0.02)
Gender (1=female)	0.10	(0.23)	0.06	(0.23)	0.06	(0.23)	0.05	(0.23)	0.06	(0.23)
Migration background (1=Yes)	-0.21	(0.28)	-0.22	(0.28)	-0.22	(0.28)	-0.21	(0.28)	-0.20	(0.28)
Previous further training/last 12 months	0.13	(0.20)	0.14	(0.20)	0.13	(0.20)	0.14	(0.20)	0.13	(0.20)
Positive Affectivity	-0.22	(0.17)	-0.22	(0.17)	-0.22	(0.17)	-0.21	(0.17)	-0.21	(0.17)
Importance for further training	0.05	(0.15)	0.06	(0.15)	0.07	(0.15)	0.06	(0.14)	0.05	(0.14)
Direct and indirect costs	-0.20	(0.12)	-0.19	(0.12)	-0.19	(0.12)	-0.19	(0.12)	-0.19	(0.12)
Supervisor:										
- Same educational background	-0.31	(0.21)	-0.34	(0.21)	-0.34	(0.21)	-0.34	(0.21)	-0.34	(0.21)
- Same age group	0.16	(0.21)	0.16	(0.21)	0.16	(0.21)	0.15	(0.21)	0.15	(0.21)
- Gender (1=female)	0.10	(0.47)	0.15	(0.45)	0.16	(0.46)	0.16	(0.46)	0.16	(0.46)
- Attitude towards further training	-0.19	(0.10)	-0.18	(0.10)	-0.18	(0.10)	-0.18	(0.10)	-0.18	(0.10)
- Cost-benefit ratio of further training	0.00	(0.08)	0.00	(0.08)	-0.00	(0.08)	0.00	(0.08)	0.00	(0.08)
Evaluation of job performance	0.80***	(0.10)	0.78***	(0.10)	0.79***	(0.10)	0.78***	(0.10)	0.79***	(0.10)
Joint duration	-0.11*	(0.06)	-0.11*	(0.06)	-0.07	(0.07)	-0.11*	(0.06)	-0.11*	(0.06)
Team size	0.09**	(0.03)	0.06*	(0.03)	0.06*	(0.03)	0.06*	(0.03)	0.06*	(0.03)
High education*Team size	0.01	(0.01)								
Age*Team size			-0.00	(0.00)						
Joint duration*High education					-0.02	(0.02)				
Joint duration*Age							0.00	(0.00)		
Age*High education									-0.00	(0.01)
Pseudo R^2 / N	0.21 / 595									

*p<0.05, **p<0.01, ***p<0.001. Standard errors in parentheses. Controlled for firms.

Appendix B 2:
Determinants for transition from an underestimation to a perfect fit, b-coeff. estimated with binary logit regression

	(1)		(2)		(3)		(4)		(5)	
High education (Ref. Low education)	0.96**	(0.31)	0.97**	(0.31)	0.97**	(0.31)	0.99**	(0.31)	0.97**	(0.31)
Age	-0.05*	(0.02)	-0.05*	(0.02)	-0.05*	(0.02)	-0.04*	(0.02)	-0.04	(0.02)
Gender (1=female)	-0.01	(0.31)	-0.04	(0.30)	-0.04	(0.30)	-0.04	(0.30)	-0.03	(0.31)
Migration background (1=Yes)	-0.38	(0.37)	-0.39	(0.37)	-0.39	(0.37)	-0.41	(0.37)	-0.39	(0.37)
Previous further training/last 12 months	0.12	(0.28)	0.12	(0.28)	0.13	(0.28)	0.13	(0.28)	0.12	(0.28)
Positive Affectivity	-0.18	(0.22)	-0.19	(0.22)	-0.18	(0.22)	-0.18	(0.22)	-0.17	(0.22)
Importance for further training	-0.02	(0.21)	-0.02	(0.21)	-0.02	(0.21)	-0.02	(0.21)	-0.01	(0.21)
Direct and indirect costs	-0.21	(0.17)	-0.20	(0.16)	-0.20	(0.16)	-0.20	(0.16)	-0.20	(0.16)
Supervisor:										
- Same educational background	-0.43	(0.31)	-0.44	(0.31)	-0.44	(0.31)	-0.45	(0.31)	-0.44	(0.31)
- Same age group	-0.55	(0.29)	-0.56	(0.29)	-0.56	(0.29)	-0.55	(0.29)	-0.55	(0.29)
- Gender (1=female)	0.66	(0.62)	0.67	(0.62)	0.67	(0.62)	0.69	(0.62)	0.69	(0.62)
- Attitude towards further training	-0.32*	(0.15)	-0.31*	(0.15)	-0.31*	(0.15)	-0.31*	(0.15)	-0.31*	(0.15)
- Cost-benefit ratio of further training	0.07	(0.11)	0.07	(0.11)	0.06	(0.11)	0.07	(0.11)	0.07	(0.11)
Evaluation of job performance	0.70***	(0.13)	0.69***	(0.12)	0.69***	(0.12)	0.68***	(0.12)	0.69***	(0.12)
Joint duration	-0.09	(0.07)	-0.09	(0.08)	-0.09	(0.09)	-0.08	(0.08)	-0.09	(0.07)
Team size	0.10*	(0.05)	0.09*	(0.04)	0.09*	(0.04)	0.08*	(0.04)	0.09*	(0.04)
High education*Team size	-0.01	(0.01)								
Age*Team size			-0.00	(0.00)						
Joint duration*High education					-0.00	(0.02)				
Joint duration*Age							0.00	(0.00)		
Age*High education									-0.00	(0.01)
Pseudo R^2 / N	0.19 / 317									

*p<0.05, **p<0.01, ***p<0.001. Standard errors in parentheses. Controlled for firms.

Appendix B 3:

Determinants for transition from a negative fit to an overestimation, b-coeff. estimated with binary logit regression

	(1)		(2)		(3)		(4)		(5)	
High education (Ref. Low education)	0.31	(0.37)	0.34	(0.37)	0.36	(0.37)	0.33	(0.37)	0.32	(0.37)
Age	-0.14***	(0.03)	-0.14***	(0.03)	-0.13***	(0.03)	-0.14***	(0.03)	-0.13***	(0.04)
Gender (1=female)	0.03	(0.37)	0.01	(0.37)	0.03	(0.37)	0.00	(0.37)	0.00	(0.37)
Migration background (1=Yes)	-0.09	(0.48)	-0.05	(0.48)	-0.05	(0.48)	-0.01	(0.48)	-0.02	(0.48)
Previous further training/last 12 months	0.15	(0.33)	0.15	(0.32)	0.11	(0.33)	0.14	(0.32)	0.13	(0.32)
Positive Affectivity	-0.33	(0.31)	-0.35	(0.31)	-0.39	(0.31)	-0.34	(0.31)	-0.36	(0.31)
Importance for further training	-0.05	(0.24)	0.01	(0.24)	0.02	(0.24)	0.01	(0.24)	-0.01	(0.24)
Direct and indirect costs	-0.12	(0.19)	-0.10	(0.19)	-0.09	(0.19)	-0.10	(0.19)	-0.10	(0.19)
Supervisor:										
- Same educational background	-0.25	(0.33)	-0.31	(0.33)	-0.31	(0.33)	-0.31	(0.33)	-0.31	(0.33)
- Same age group	1.14**	(0.36)	1.10**	(0.36)	1.10**	(0.36)	1.10**	(0.36)	1.09**	(0.36)
- Gender (1=female)	-1.14	(0.90)	-0.91	(0.85)	-0.89	(0.85)	-0.93	(0.85)	-0.94	(0.85)
- Attitude towards further training	-0.07	(0.16)	-0.05	(0.16)	-0.04	(0.16)	-0.04	(0.16)	-0.03	(0.16)
- Cost-benefit ratio of further training	-0.12	(0.12)	-0.12	(0.12)	-0.12	(0.12)	-0.12	(0.12)	-0.12	(0.12)
Evaluation of job performance	1.02***	(0.17)	1.01***	(0.17)	1.02***	(0.17)	1.01***	(0.17)	1.01***	(0.17)
Joint duration	-0.17	(0.09)	-0.15	(0.09)	-0.10	(0.10)	-0.16	(0.09)	-0.15	(0.09)
Team size	0.07	(0.04)	0.03	(0.04)	0.03	(0.04)	0.03	(0.04)	0.04	(0.04)
High education*Team size	-0.03	(0.02)								
Age*Team size			-0.00	(0.00)						
Joint duration*High education					-0.03	(0.03)				
Joint duration*Age							0.00	(0.00)		
Age*High education									-0.00	(0.00)
Pseudo R^2 / N	0.29 / 278									

*p<0.05, **p<0.01, ***p<0.001. Standard errors in parentheses. Controlled for firms.

Appendix B 4:

Determinants for transition from a negative fit to a positive fit, b-coeff. estimated with binary logit regression

	(1)		(2)		(3)		(4)		(5)	
High education (Ref. Low education)	0.72*	(0.32)	0.72*	(0.32)	0.73*	(0.32)	0.71*	(0.32)	0.73*	(0.32)
Age	-0.05*	(0.02)	-0.05*	(0.02)	-0.05*	(0.02)	-0.05*	(0.02)	-0.03	(0.03)
Gender (1=female)	0.03	(0.34)	-0.07	(0.33)	-0.07	(0.33)	-0.07	(0.33)	-0.09	(0.33)
Migration background (1=Yes)	0.12	(0.45)	0.05	(0.44)	0.03	(0.44)	0.07	(0.44)	0.07	(0.44)
Previous further training/last 12 months	0.01	(0.30)	0.06	(0.30)	-0.01	(0.31)	0.03	(0.30)	0.01	(0.31)
Positive Affectivity	0.24	(0.28)	0.29	(0.28)	0.30	(0.28)	0.30	(0.28)	0.28	(0.28)
Importance for further training	1.15***	(0.26)	1.11***	(0.26)	1.15***	(0.26)	1.13***	(0.26)	1.10***	(0.26)
Direct and indirect costs	-0.40*	(0.18)	-0.38*	(0.17)	-0.39*	(0.17)	-0.39*	(0.17)	-0.39*	(0.17)
Supervisor:										
- Same educational background	-0.31	(0.32)	-0.35	(0.31)	-0.32	(0.31)	-0.36	(0.31)	-0.33	(0.31)
- Same age group	0.25	(0.33)	0.22	(0.33)	0.23	(0.33)	0.23	(0.33)	0.21	(0.33)
- Gender (1=female)	-0.06	(0.64)	0.09	(0.62)	0.08	(0.61)	0.10	(0.61)	0.12	(0.62)
- Attitude towards further training	-0.17	(0.15)	-0.16	(0.15)	-0.15	(0.15)	-0.15	(0.15)	-0.15	(0.15)
- Cost-benefit ratio of further training	0.11	(0.11)	0.11	(0.11)	0.10	(0.11)	0.10	(0.11)	0.10	(0.11)
Evaluation of job performance	0.88***	(0.14)	0.82***	(0.14)	0.85***	(0.14)	0.82***	(0.14)	0.83***	(0.14)
Joint duration	-0.16	(0.10)	-0.17	(0.09)	-0.06	(0.11)	-0.16	(0.09)	-0.15	(0.09)
Team size	0.12*	(0.05)	0.06	(0.04)	0.06	(0.04)	0.06	(0.04)	0.06	(0.04)
High education*Team size	-0.02	(0.01)								
Age*Team size			0.00	(0.00)						
Joint duration*High education					-0.04	(0.03)				
Joint duration*Age							0.00	(0.00)		
Age*High education									-0.00	(0.01)
Pseudo R^2 / N	0.31 / 325									

*p<0.05, **p<0.01, ***p<0.001. Standard errors in parentheses. Controlled for firms.

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