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Going across Europe for an apprenticeship? A factorial survey experiment on employers' hiring preferences in Germany

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<Appendix main head>Online Appendix

<Appendix sub head>Details on the Factorial Survey Experiment

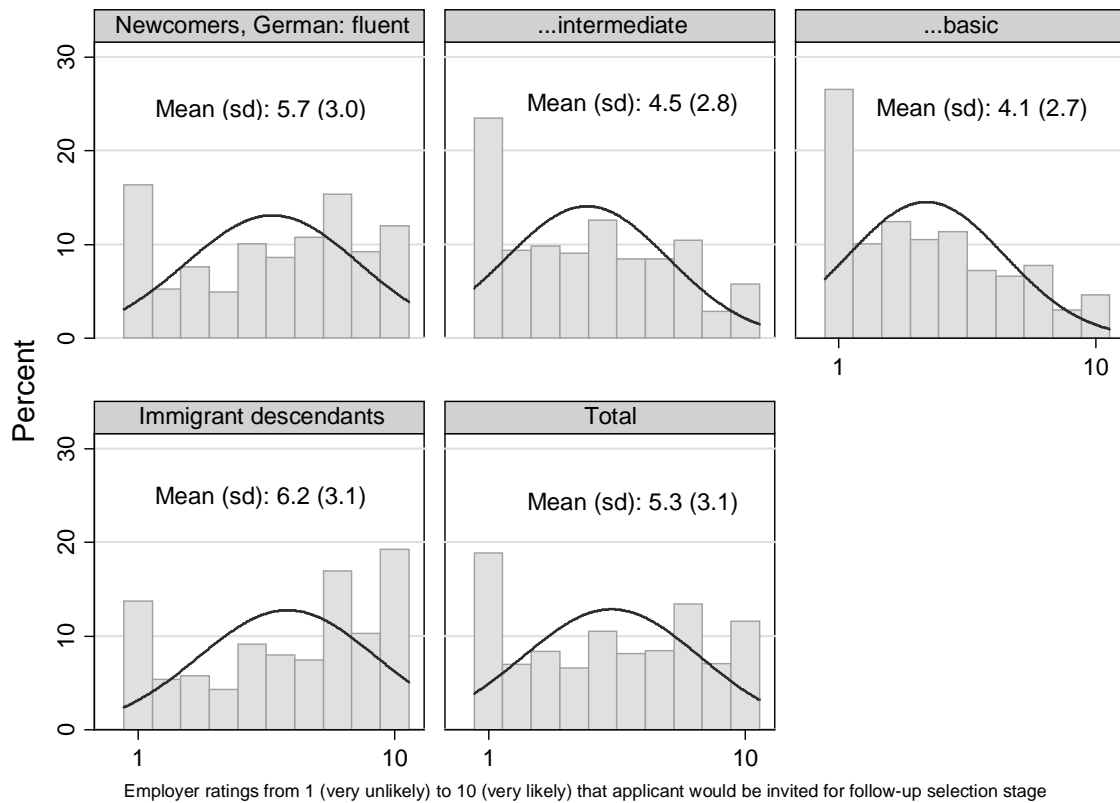
<Appendix sub sub head>Rating scale and distribution of vignette ratings

Besides the wide-ranging scale from 1 (very unlikely) to 10 (very likely), we implemented a random order of vignettes presented to each respondent, including the possibility to go back and forth while rating the vignettes and to correct ratings. This approach helps to avoid ratings disproportionately placed at the bottom or top-end of a rating scale (censored responses), although the respondent actually would have wanted to differentiate their ratings more (Auspurg and Hinz, 2015: 66f.). Figure A1 shows that respondents took the rating task seriously and differentiated their ratings across the entire scale. We are thus confident to treat the employer ratings as our metric dependent variable.

<Figure A1 near here>

<Figure starts>

<Figure head – goes below figure>**Figure A1** Distribution of vignette ratings (N: 3289)



Source: BIBB Training Panel 2014 (doi:10.7803/371.14.1.2.10), authors' own calculations.

</Figure ends>

<Appendix sub sub head>Sampling of vignettes

A d-efficient sample of vignettes was drawn from the so-called vignette universe to be distributed into sets of five vignettes (for details, see Auspurg and Hinz, 2015: 16ff.). This approach allows for estimating the effects of each dimension and their interactions independently. Vignettes displaying immigrant descendants and fluent German-speaking newcomers are oversampled to reach more precise estimates of the expected smaller difference between these two groups. Since discrimination might be partly responsible for gender inequalities, we decided to vary the vignette persons' sex only between respondents. In total, a sample of 125 vignettes distributed into 25 sets of five was multiplied by two, resulting in a total of 50 different vignette sets (25 sets

with male and 25 sets with female applicants only). These vignettes sets were randomly assigned to the employers. Furthermore, the order in which the vignettes were presented was randomized within each respondent to control for potential order effects.

<Appendix sub sub head>Test of randomization and regression techniques

Our data set consists of variable and controls at the vignette level and the firm level (see Table A1) and each respondent rated five vignettes. To account for this nested data structure, we estimated linear multi-level regression models. Table A2 shows that the randomization of vignette sets was successful because correlations between vignette-level and firm-level variables are negligible. Accordingly, regression estimates differ only minimally between models with or without firm-level variables or firm fixed-effects (see Table 2 in the main document). All findings discussed are based on random-intercept models including all control variables to account for any remaining correlations with respect to the vignette dimensions but more importantly for the correlations between the firm-level controls and the training-strategy variable.

<Tables A1 to A5 near here>

<Table starts>

<Table head – goes before table>**Table A1** Descriptive statistics of vignette-level and firm-level predictors

<i>Vignette dimensions and their levels</i>	<i>N:</i>	
	<i>Vignettes</i>	<i>Per cent</i>
1. Immigrant group		
Immigrant descendants	1,033	31.4
Newcomer, German: fluent	977	29.7
Newcomer, German: intermediate	643	19.6
Newcomer, German: basic	636	19.3
2. Education type & level		
Intermediate secondary school degree	537	16.3
Upper secondary school degree	548	16.7
School-based training/technical occupation	553	16.8
School-based training/sales & accounting occupation	549	16.7
Bachelor's degree/engineering	547	16.6
Bachelor's degree/business economics	555	16.9
3. Gender		
Male	1,587	48.3
Female	1,702	51.7

4. Relatives live in town		
Yes	1,702	51.8
No information on relatives	1,587	48.2
5. Applicant will apply for additional financial support		
Yes	1,663	50.6
No information on additional support	1,626	49.4
	3289	
<i>Firm-level variables</i>	<i>N:</i>	
	<i>Employers</i>	<i>Percent</i>
6. Type of occupation		
Male-dominated (percentage of male apprentices ≥ 70)	338	51.1
Non male-dominated (percentage of male apprentices < 70)	323	48.9
7. Region		
East Germany including Berlin	178	26.9
West Germany	483	73
8. Economic sector		
Agriculture, production, construction	286	43.3
Sales, maintenance, business support and other services	265	40.1
Public sector, education, medical and care	110	16.6
9. Firm size		
1 to 19 employees	158	23.9
20 to 99 employees	185	28
100 to 199 employees	87	13.2
200 and more employees	231	35
10. Training strategy		
High post-apprenticeship hiring rate: $\geq 75\%$ of graduates hired	338	51.1
Low post-apprenticeship hiring rate: $<75\%$ of graduates hired	323	48.9

	661
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Source: BIBB Training Panel 2014 (doi:10.7803/371.14.1.2.10), authors' own calculations.
</Table ends>

<Table starts>

<Table head – goes before table> **Table A2** Correlations of vignette dimensions and firm-level variables

	<i>Vignette-level variables</i>					<i>Firm-level variables</i>				
	1	2	3	4	5	6	7	8	9	10
1 Immigrant group	1									
2 Gender	-0.005	1								
3 Education	-0.006	0.004	1							
4 Relatives in town	-0.013	0.006	0.012	1						
5 Financial support	-0.103	-0.002	0.021	-0.001	1					
6 Firm size	-0.009	-0.040	-0.006	0.009	0.007	1				
7 Economic sector	0.000	-0.007	-0.006	-0.012	-0.005	0.030	1			
8 Region	-0.006	-0.084	-0.020	-0.006	0.007	-0.018	-0.010	1		
9 Type of occupation	0.016	0.032	-0.002	0.014	0.005	-0.029	-0.461	0.125	1	
10 Training strategy	0.010	0.021	-0.003	0.007	-0.007	0.439	-0.073	-0.081	-0.047	1

Source: BIBB Training Panel 2014 (doi:10.7803/371.14.1.2.10), authors' own calculations.

</Table ends>

sd_employer	1.876
sd_vignette	2.202
Rho	0.421

* p<0.1; ** p<0.05; *** p<0.01; se = standard error.

Dependent variable *employer ratings* is measured from 1 (very unlikely) to 10 (very likely) that applicants are invited for a follow-up selection stage, model includes all predictors of model 3, Table 2.

Number of observations: 3,289 (vignettes); 661 (employers).

Source: BIBB Training Panel 2014 (doi:10.7803/371.14.1.2.10), authors' own calculations.

</Table ends>

<Table starts>

<Table head – goes before table> **Table A4** Interaction of applicants' immigrant group and gender by firms' post-apprenticeship hiring rate; separate linear random-intercept models

	<i>Firms with low hiring rate</i>		<i>Firms with high hiring rate</i>	
	Model A4a coeff.	se	Model A4b coeff.	se
Gender (ref. male)	-0.54**	0.29	-1.01***	0.29
Immigrant group (ref. immigrant descendants)				
Newcomer, German: fluent	-0.26	0.20	-0.80***	0.21
Newcomer, German: intermediate	-1.97***	0.22	-1.81***	0.24
Newcomer, German: basic	-2.04***	0.22	-2.52***	0.24
Interaction: Gender x immigrant group				
x Newcomer, German: fluent	-0.21	0.28	0.25	0.30
x intermediate	0.51	0.31	0.13	0.33
x basic	0.06	0.31	0.37	0.33
Log likelihood	-3968.2		-3801.1	
sd_employer	1.963		1.803	
sd_vignette	2.19		2.249	
Rho	0.445		0.391	
N vignettes/employers	1,682	338	1,607	323

* p<0.1; ** p<0.05; *** p<0.01; se = standard error.

Dependent variable *employer ratings* is measured from 1 (very unlikely) to 10 (very likely) that applicants are invited for a follow-up selection stage, model includes all predictors of model 3, Table 2.

Source: BIBB Training Panel 2014 (doi:10.7803/371.14.1.2.10), authors' own calculations.

</Table ends>

<Table starts>

<Table head – goes before table> **Table A5** Employer ratings by the occupations' gender domination; separate linear random-intercept models

	Male-dominated occupations		Non male-dominated occupations	
	coeff.	se	coeff.	se
<i>Vignette-level variables</i>				
Immigrant group (ref. immigrant descendant)				
Newcomer, German: fluent	-0.59***	0.14	-0.38***	0.15
Newcomer, German: intermediate	-1.44***	0.15	-1.99***	0.16
Newcomer, German: basic	-1.73***	0.15	-2.60***	0.16
Education type & level (ref. intermediate school degree)				
Upper secondary school degree	-0.70***	0.19	0.04	0.20
School-based training/technical occupation	0.10	0.19	-0.30	0.20
School-based training/sales & accounting occupation	-0.76***	0.19	0.27	0.20
Bachelor's degree/engineering	-1.26***	0.19	-0.71***	0.20
Bachelor's degree/business economics	-1.61***	0.18	-0.46**	0.20
Gender (ref. male)	-1.34***	0.24	-0.03	0.22
Relatives live in town (ref. no information)	0.09	0.11	0.12	0.11
Additional financial support (ref. no information)	-0.09	0.11	-0.29**	0.11
<i>Firm-level variables</i>				
East Germany (ref. West Germany)	0.21	0.27	0.57**	0.28
Economic sector (ref. agric., production, construction)				
Sales, maintenance, business support and other services	1.12***	0.28	-0.20	0.31
Public sector, education, medical and care	0.13	0.50	-0.57*	0.33
Firm size (ref. 1 to 19 employees)				
20 to 99 employees	0.42	0.34	-0.27	0.32
100 to 199 employees	0.55	0.41	-0.19	0.38
200 and more employees	0.31	0.32	0.21	0.31

High post-apprenticeship hiring rate (ref. no/low hiring)	0.29	0.27	0.10	0.25
Constant	6.74***	0.12	7.85***	0.29
Log likelihood	-		-3797.1	
	3925.03			
sd_employer	1.736		1.960	
sd_vignette	2.236		2.140	
rho	0.376		0.456	
N vignettes/employers	1,677	338	1,612	323

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; se = standard errors.

Dependent variable *employer ratings* is measured from 1 (very unlikely) to 10 (very likely) that applicants are invited for a follow-up selection stage. East Germany includes Berlin.

Source: BIBB Training Panel 2014 (doi:10.7803/371.14.1.2.10), authors' own calculations.

</Table ends>

<notes>

¹ Comparing natives with immigrants is not the focus here. The factorial survey design needed for such a comparison would have required either too large a sample of employers or the deletion of another dimension to be considered, such as applicants' gender.

¹ Information for earlier years was not available to us.

¹ Differentiating the analysis by the occupations' gender domination (see Table A5, online appendix) shows that the gender difference is only significant within the male-dominated occupations – indicating that employer discrimination in male-dominated occupations is a likely explanation.