When Managers Choose: Gender Disparities in Employer Training Provision

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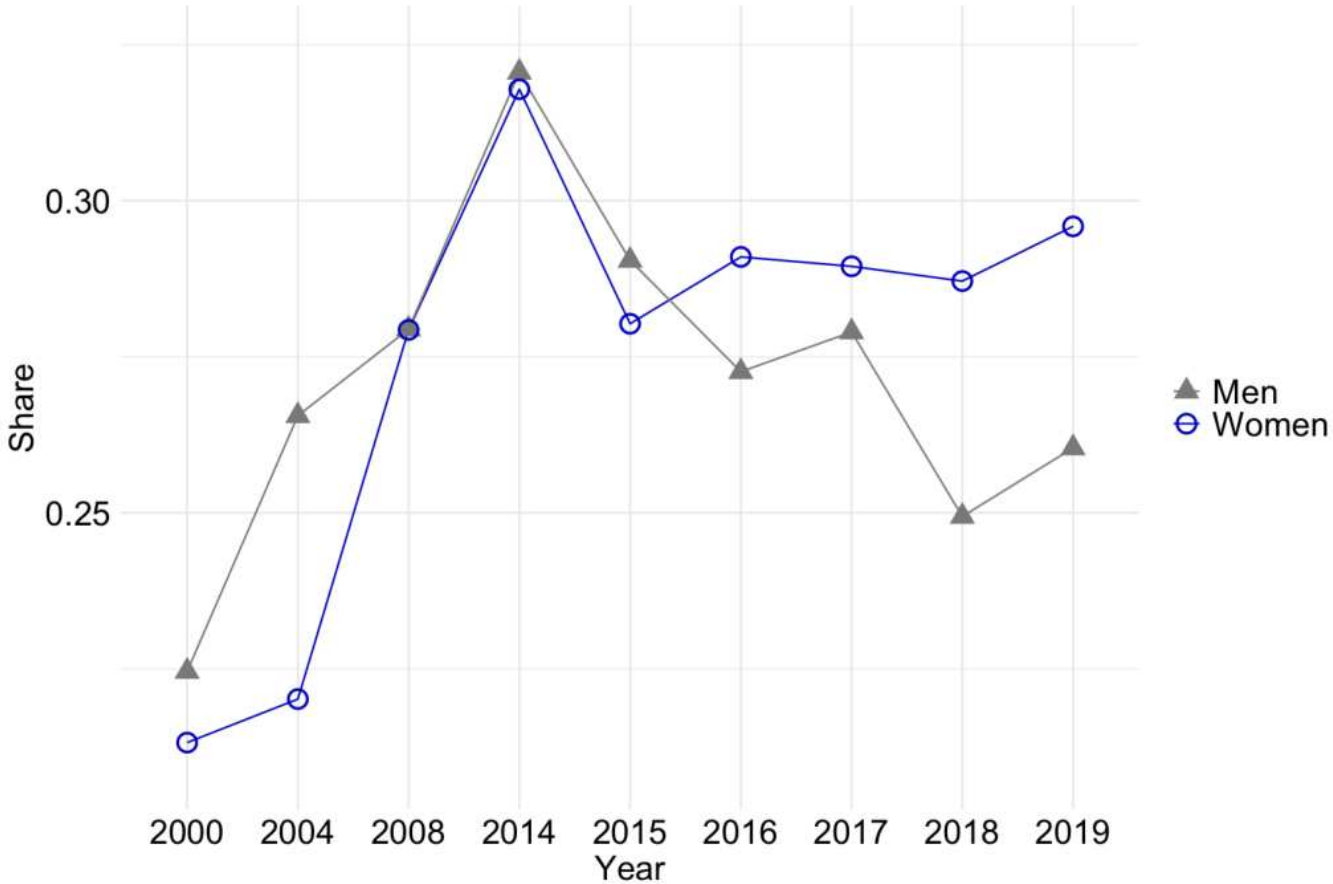
- In this context: **on-the-job training** is crucial for workers to acquire new skills and to stay updated (EU: participation rate of 50% in 2025)
- **Equal access to on-the-job training** is key to providing all socio-demographic groups with equal opportunities to adapt to changes in the labor market. One dimension of this is **gender equality**, especially at the **early career stage**.

On-the-Job Training Participation in Germany

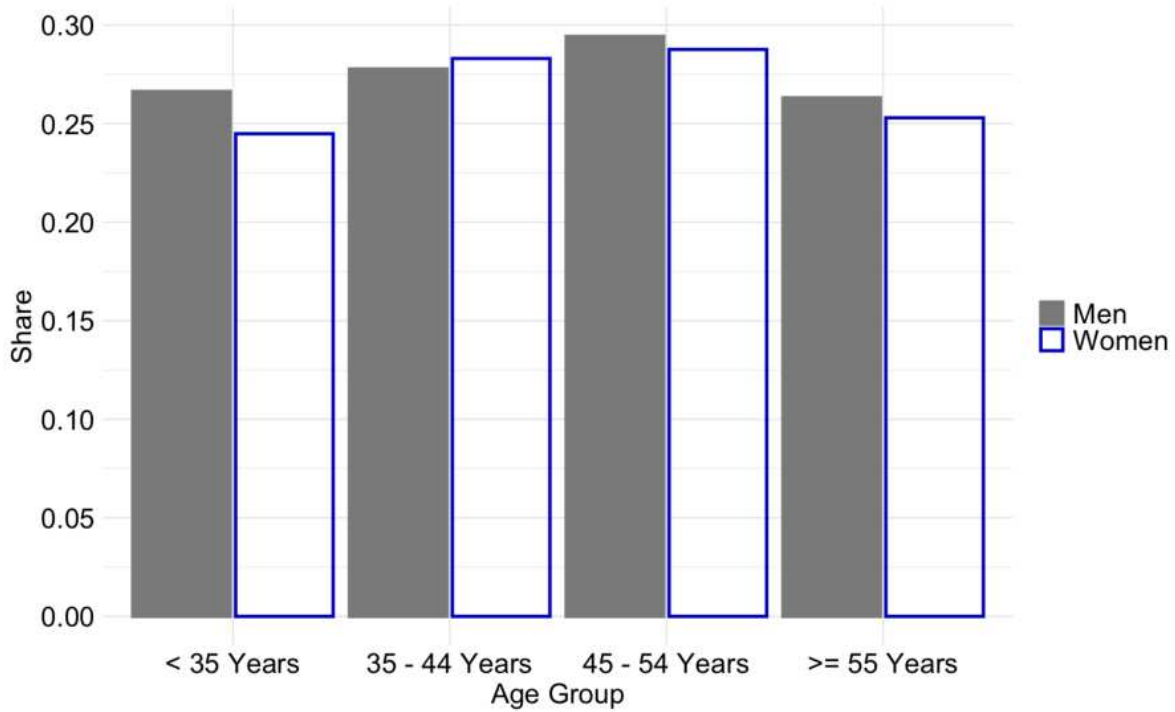
Figure: On-the-Job Training Participation Over Time by Gender



Data: SOEP v36, years 2000, 2004, 2008, 2014-2019, age 25-65, no self-employed

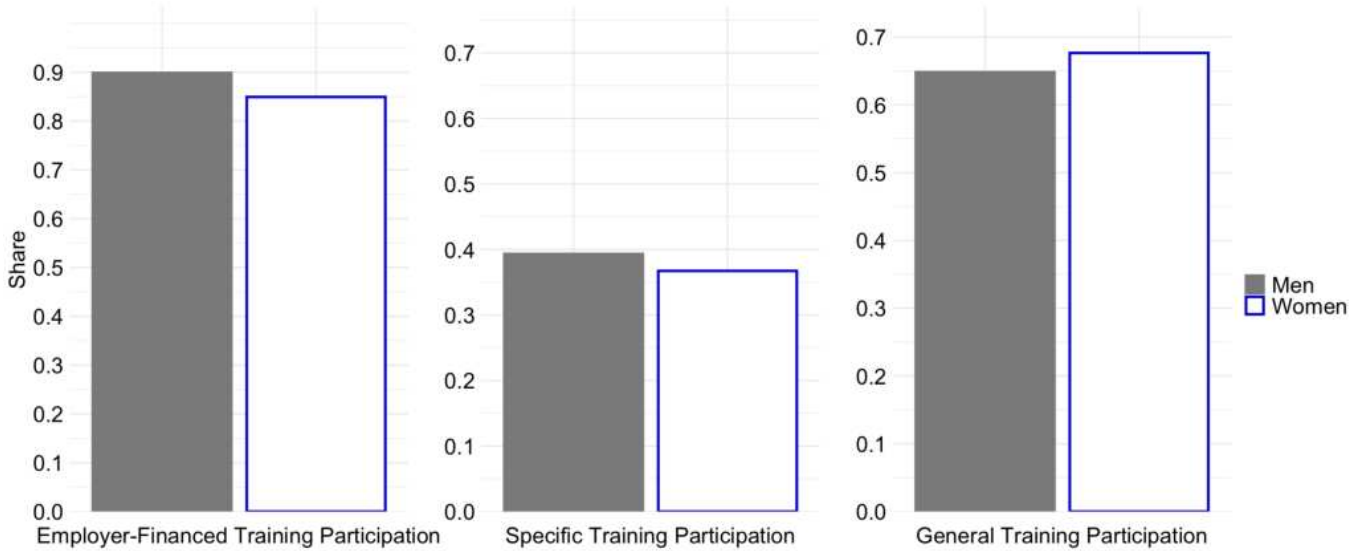
On-the-Job Training Participation: by Age ....

Figure: On-the-Job Training Participation by Age of Trainees



... and Type of Training

Figure: On-the-Job Training Participation by Type of OJT



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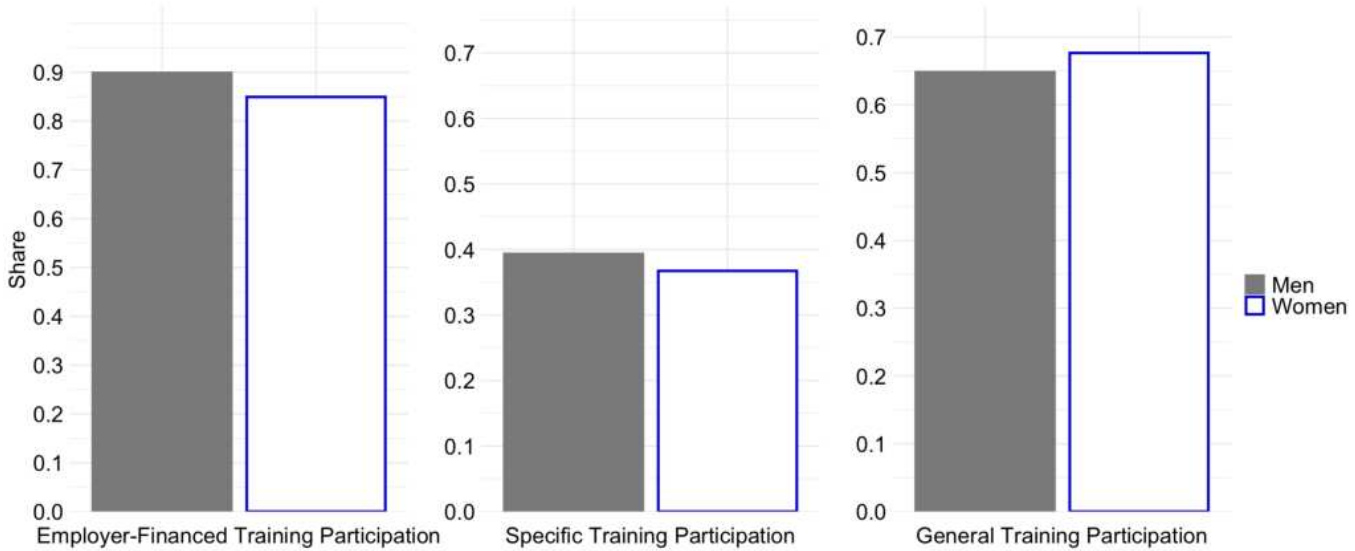

- There is a **gender gap in training participation** for **young workers** and concerning **employer-financed & specific training**.
- In line with **previous research on gender-specific training participation** (e.g. Lynch, 1992; Fitzenberger and Muehler, 2015, Caliendo et al., 2024).

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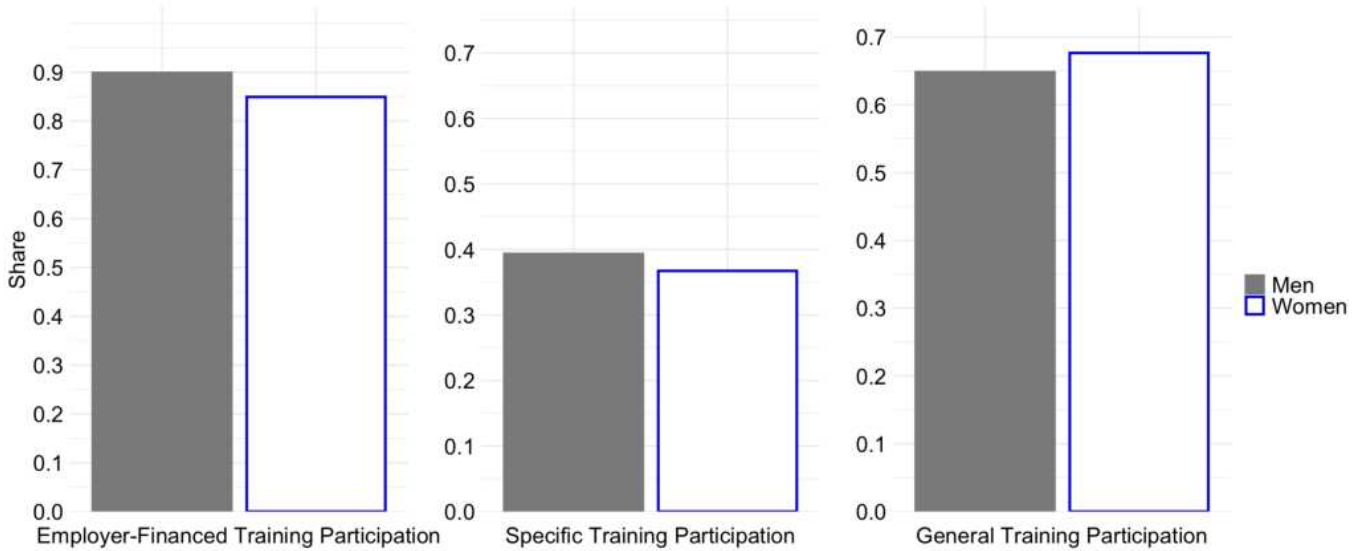

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- In line with **previous research on gender-specific training participation** (e.g. Lynch, 1992; Fitzenberger and Muehler, 2015, Caliendo et al., 2024).
- BUT: with SOEP data we cannot disentangle the demand for training (**employee's training participation**) from the supply of training (**training offer of the manager**).

Research Questions

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- **Research Question 1**: Is there a gender gap in the **provision of on-the-job training**, i.e. are female training candidates offered more (or less) training than male training candidates?
- **Research Question 2**: How does the **training offer decision** differ by the **gender of the manager**?

Related Literature (1)

- **Importance of on-the-job training**
  - **for the employee:** allows to acquire new skills, stay updated, enhances productivity; positive impact on wages and promotions (Frazis and Loewenstein, 2005; Melero, 2010; Haelermans and Borghans, 2012)
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- **Determinants of on-the-job training participation**:
  - **Age, education, ability, occupational status, experience** and **contract type** (Lynch 1992; Oosterbeek, 1996; Lynch and Black, 1998; Bassanini et al., 2007; Maximiano, 2012; Cabrales et al., 2017).
  - **Labour market sector** (Oosterbeek, 1998) and **firm size** (Lynch and Black, 1998; Maximiano, 2012).
  - **Personality characteristics, preferences** (Caliendo et al., 2023, 2024) and **gender** (e.g. Lynch, 1992; Dieckhoff and Steiber, 2011; Fitzenberger and Muehler, 2015; Caliendo et al., 2024)

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$\Rightarrow$ **Our contribution:** We utilize employer data to **provide novel insights into on-the-job training from the supply side**, and provide **causal evidence on the provision** of on-the-job training.

Related Literature (2)

- **The role of managers and their characteristics:**
  - for **firms' performances** (Bertrand and Schoar, 2003; Bloom and Van Reenen, 2010; Lazear et al., 2015; Bandiera et al., 2020; Fenizia, 2022) and **career progression** of workers (Haegele, 2022)
  - for **employee turnover** (Hoffmann and Tadelis, 2021), the **effort** workers provide (Fredrisksen et al., 2020), **task allocation** (Adhvaryu et al., 2019), provision of **on-the-job training** (Caliendo et al., 2024)
  - **Manager's gender** plays a significant role for decision making (hiring, evaluations, promotions), but direction of the **effect of female managers** on persisting gender gaps inconclusive (e.g. Bagues and Esteve-Volart; Kunze and Miller, 2017; Bagues et al., 2017; Bertrand et al., 2019; Bossler et al., 2020; Maida and Weber, 2021; Arceo-Gomez and Campos-Vazquez, 2022)

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$\Rightarrow$ **Our contribution:** We investigate the **role of the gender of the manager** for the provision of on-the-job training and provide a number of **potential channels** through which the effects could operate.

Data: The BIBB Cost-Benefit Survey

- **BIBB Cost-Benefit Survey** is a cross-sectional firm-level survey that is run every five years
- Representative sample based on the firm register of the Federal Employment Agency (at least one employee subject to SSC)
- About **3,500 responding firms** with computer-assisted personal interviewing (CAPI) method; out of which about **1,100 firms** are randomly chosen to answer the training vignette
- Respondents are **managers** (firm owners, HR managers, etc.), very large firms (top percentile, >2,600 employees) are excluded
- **Firm information**: firmsize, firmtype, work council, collective bargaining agreement, institutional information, firm sector
- **Manager information**: gender, firm position, qualification, tenure, decision making power and personality traits

Background Characteristics: Managers

	Mean	Median	Min	Max
Female	0.43	0.50	0	1
Firm Position:				
Owner	0.35	0.48	0	1
CEO	0.13	0.34	0	1
Department Head	0.07	0.26	0	1
Head HR	0.17	0.38	0	1
Head Commerce	0.08	0.28	0	1
Head of Training	0.07	0.25	0	1
Other Position	0.11	0.32	0	1
Qualification:				
No Vocational Training	0.01	0.08	0	1
Vocational Training	0.21	0.40	0	1
Advanced Voc Degree	0.35	0.48	0	1
Academic Degree	0.44	0.50	0	1
Firm Tenure in Years	14.55	10.49	0	51
Observations	1,144			

Source: BIBB-CBS 2017/2018, own calculations.

[a] *Note:* For these variables the number of observations is slightly lower due to item non-response.

Firms

Vignette Design (1) – Attributes and Choice Sets

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  - gender (male/female)
  - age (25, 35, 45, 55 years)
  - professional competence (above/below/average)
  - and job mobility in last 5 years (changed employer never/once/twice).

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  - Duration (2, 5, 10 days) and
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  - the cost sharing agreement between the employer and the employee (0, 50, 100%).
- This results in (2 x 4 x 3 x 3 x 3 x 3 x 3) = **1,944 alternatives** or vignettes, making a **full factorial design** infeasible.
- Instead, we reduce the number of choice sets and employ a **fractional factorial design** that meets the requirements of an **efficient choice design** (Huber and Zwerina, 1996).

Proportional frequencies Attributes

Vignette Design (2) – Example

Figure: Example of the Discrete-Choice Experiment on Training Decisions

Irrespective of the actual situation in your company, please imagine the following scenario:

Two of your skilled workers would like to continue their professional development. For operational reasons, however, only one of the two skilled workers can participate in further education. Which one would you choose?

The two skilled worker differ according to gender, age, professional competence and occupational mobility. The further training differs with regard to the applicability of acquired competences in your or other companies as well as the training's duration and costs. The skilled worker is released for the duration of the training. The daily rate for course fees and travel costs is €250. With regard to all features not listed, skilled workers and trainings are identical. All information about the two skilled workers and the trainings can be found below.

Please indicate if you would like to train skilled worker 1 or 2.

Profile Skilled worker 1	**Profile Skilled worker 2**
The skilled worker …	*The skilled worker …*
... is female.	… is male.
... is 45 years old.	... is 55 years old.
... has above average professional competencies.	... has average professional competencies.
... 1 time changed employer within the last 5 years.	... never changed employer within the last 5 years.
The training …	*The training …*
... is completely useable also in other firms.	… is partly useable also in other firms.
... takes 5 working days.	... takes 2 working days.
... is covered by 100% of the employer. The participant has no costs.	... is not covered by the employer. 100% of costs are taken over by the participant.

Econometrics

- **Each participant** (manager) i chooses repeatedly between **two alternatives**
- Each choice alternative j in choice set t can be characterized by the **observed attributes** x_{ijt} of the hypothetical training candidate and training context.
- Given choice set t, manager i chooses alternative k if

$$U_{ikt} > U_{ist} \forall s \neq k.$$

The **manager's utility** is given by:

$$U_{ijt} = \beta_i' x_{ijt} + \epsilon_{ijt} = (\bar{\beta} + \nu_i)' x_{ijt} + \epsilon_{ijt}$$

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- The individual likelihood contribution L_i conditional on unobserved heterogeneity is described by:

$$L_i|\nu_i = \prod_{t=1}^{T} \frac{\exp(\beta_i' x_{i1t})^{d_{i1t}} \exp(\beta_i'(x_{i2t}))^{1-d_{i1t}}}{\sum_{j=1}^{2} \exp(\beta_i' x_{ijt})},$$

where d_{i1t} is a dummy variables which is equal to one if individual i chooses alternative $j = 1$ in choice set t.

Question:

In general, how are the **attributes** of the training candidate and the training context related to the **training offer decision**?

Baseline Specification: Parameter Estimates & Marginal Effects

	Mixed Logit		
	Mean	SD	AME
	(1)	(2)	(3)
Female	0.078**	0.429***	0.0121**
Age *(ref. cat.: 55 Years)*			
25 Years Old	0.885***	0.504***	0.1409***
35 Years Old	0.842***	0.426**	0.1350***
45 Years Old	0.663***	0.344*	0.1072***
Occupational Experience *(ref. cat.: below av.)*			
Above Average	0.908***	1.191***	0.1389***
Average	0.508***	0.180	0.0856***
Job Mobility	-0.486***	0.412***	-0.0630***
Usability in other Firms *(ref. cat.: not usable)*			
Completely	-0.543***	0.230	-0.0846***
Partly	-0.470***	0.024	-0.0730***
Training Duration	-0.054***	0.104***	-0.0276***
Cost Coverage by the Employer *(ref. cat.: 0)*			
100 Percent	-0.200***	0.069	-0.0314***
50 Percent	0.024	0.333**	0.0035
Number of Observations	13,494	13,494	13,494
Log-Likelihood	-4,052	-4,052	-4,052

Source: BIBB-CBS 2017/2018. Own calculations.
Note: ***/**/* indicate statistical significance at the 1%/5%/10%-level. Estimation based on 300 scrambled Halton draws.

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Questions:

How does the **gender of the training candidate** interact with the other attributes of the training (candidate) ?

Does the **gender of the manager** play a role for the provision of on-the-job training?

Interaction with Gender of Training Candidate: Parameter Estimates

	Mixed Logit Interacted Female Candidate	
	Mean (1)	Int. with Female (2)
Female	0.220	
Age		
25 Years Old	1.062***	-0.450**
35 Years Old	0.876***	-0.166
45 Years Old	0.615***	-0.025
Occupational Experience		
Above Average	0.769***	0.294
Average	0.412***	0.202
Job Mobility	-0.433***	-0.149
Usability in other Firm		
Completely	-0.635***	0.100
Partly	-0.485***	0.003
Training Duration	-0.066***	0.023
Cost Coverage by the Employer		
100 Percent	-0.043	-0.348*
50 Percent	0.091	-0.116
Number of Observations		13,494
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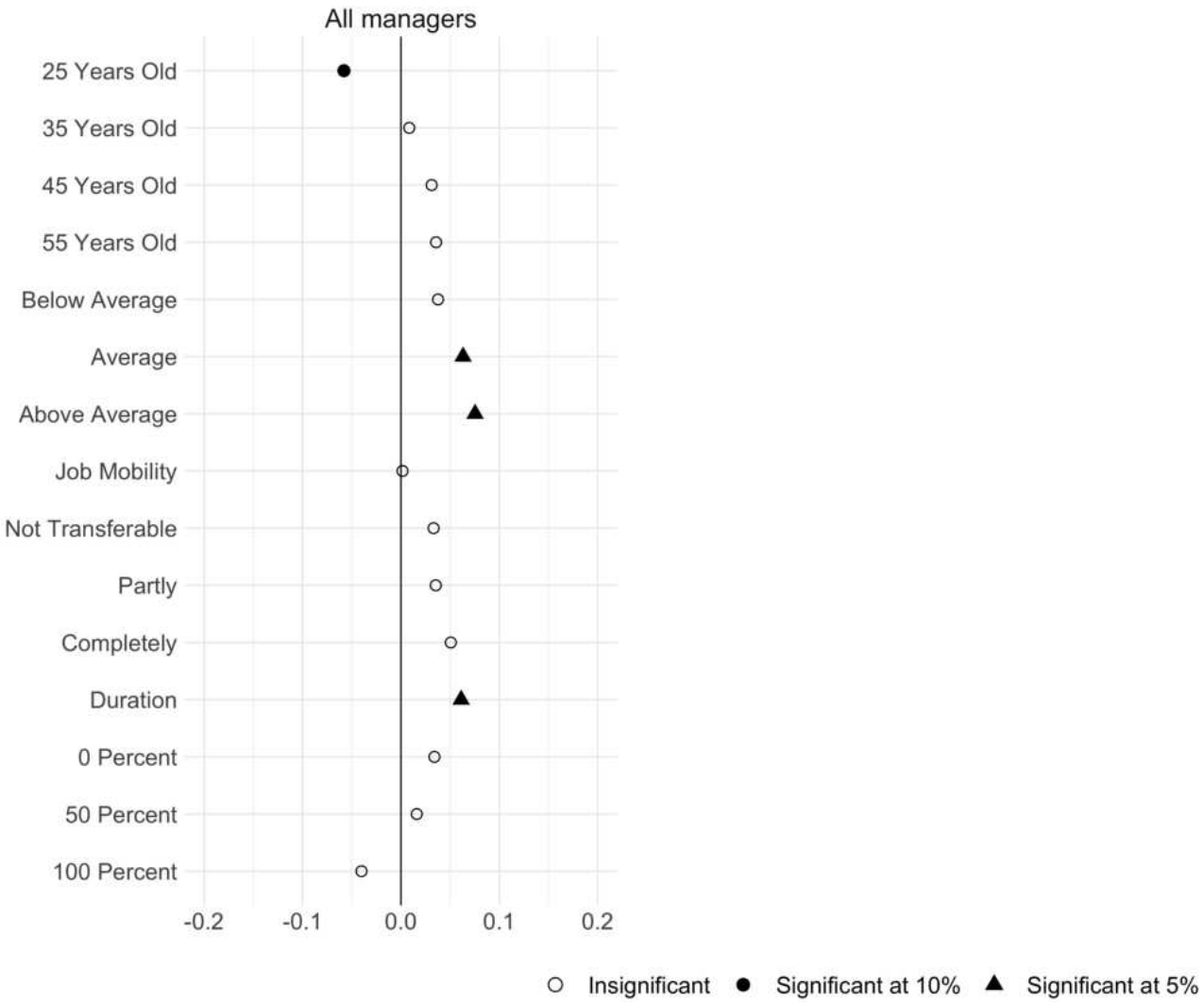
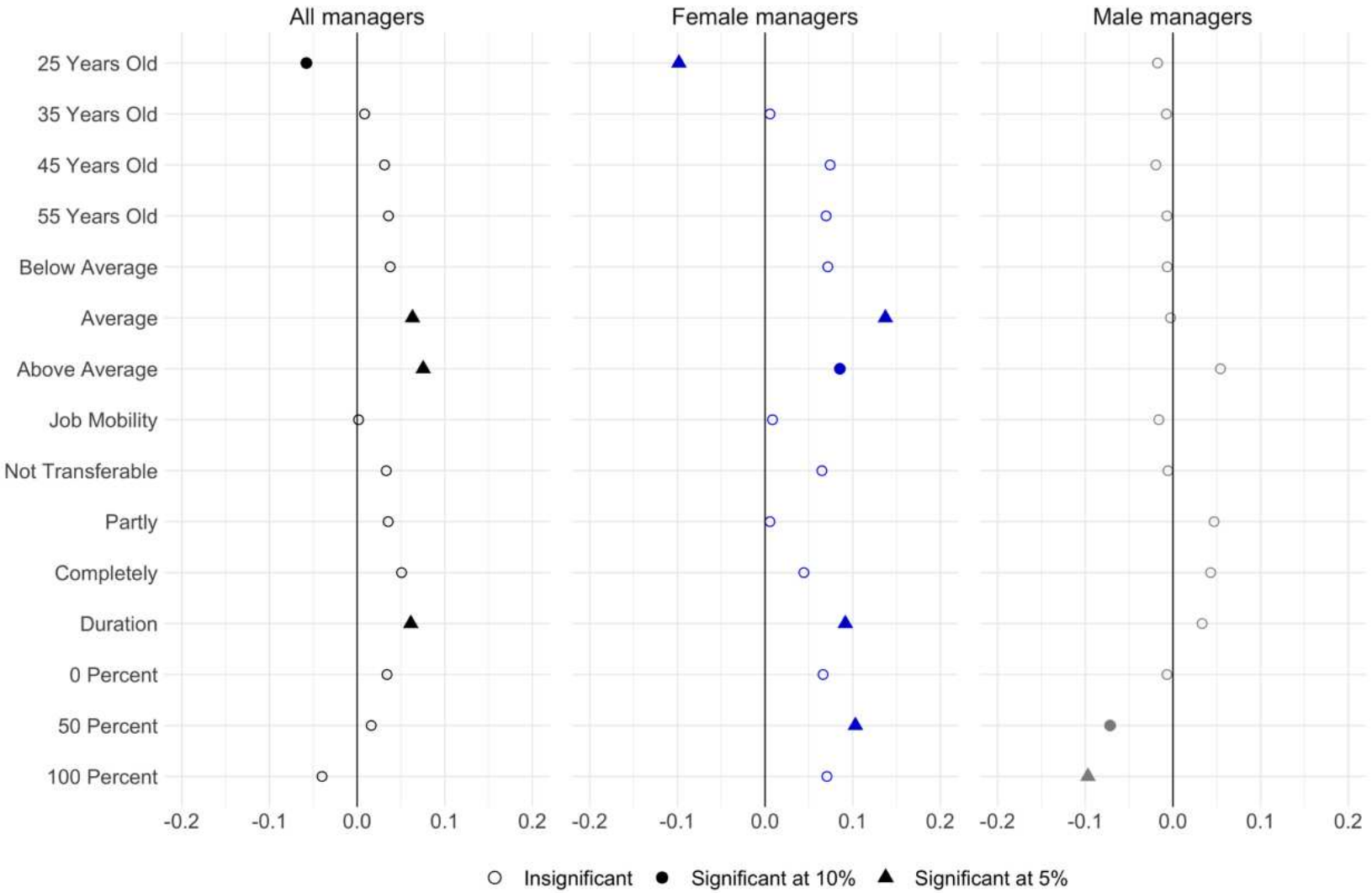
Gender gap in average marginal effects

Figure: Gender gap in training offers of vignette attributes I



Gender gap in average marginal effects

Figure: Gender gap in training offers of vignette attributes II



Robustness Checks

Weighted Specification

- Managers not only vary in their gender, but in several **other observed and unobserved characteristics**
- We use our extensive background information, to test how sensitive our results are to variation in **observable characteristics** (firm position, education, tenure, personality traits, decision-making power, firmsize, firmtype, sector, legal status, work council, collective bargaining agreement)
- We conduct a **robustness analysis** by re-estimating our split sample heterogeneity analysis, using **propensity score weights** to balance all observable characteristics between male and female managers

Diffs

MEs Matching Quality

Without Owners

- Owners might have potentially **different incentives** to maximize returns and profits
- We want to rule out that our results are driven by this particular group of managers

MEs

Summary and relation to previous results

Most important findings:

- The **gender of the candidate** plays a role for the training decision regarding **young workers and experience**. Young females receive less training offers than young males, however females are preferred over males when having (above) average experience.
- Training offer decisions **differ between male and female managers**.

Summary and relation to previous results

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Relation to previous results:

- **Age-dependent gender discrimination** has been observed in previous studies in the context of hiring (Petit, 2007), fully employer-financed training participation (Fitzenberger and Muehler, 2015) or teaching evaluations (Mengel et al., 2019)
- Gallen (2024) shows that **women who look most like future mothers** experience the largest gaps between pay and productivity and this is - at least partly - due to statistical discrimination by employers.

Possible explanations and potential channels

- **Product market competition**: Disadvantage for young female employees is driven by **female managers in firms operating in a more competitive environment**. Heterogeneity by competition
- **Industry gender ratio**: Disadvantage for young female employees is driven by **female managers in male-dominated industries**. Heterogeneity by male/female-dominated industry
- **Industrial relations systems**: Disadvantage for young female employees is driven by **female managers in firms without CBA** Heterogeneity by CBA

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- **Industrial relations systems**: Disadvantage for young female employees is driven by **female managers in firms without CBA** Heterogeneity by CBA
- **Workplace culture**: Disadvantage for young female employees is similar in **firms with higher and lower gender wage gaps**. Overall, however, women receive more training in more inclusive workplaces. Heterogeneity by GWG
- **What else?**: Manager characteristics like firm tenure or risk aversion do not drive our effects.

Preliminary Conclusions & Policy Implications

Contributions

- We shed light on gender differences on the **supply side of training investment**, by studying employers' allocation of on-the-job training offers
- We contribute to the literature, by exploring the **role of the manager's gender** on training investment choices
- We provide suggestive evidence for a number of **potential channels**

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Policy Implications

1. "Too low" training rates might not only be caused by some workers' reluctance to engage in training. **Managers' reluctance to offer training** likely contributes to the training gaps we observe.
2. Policies targeting increased training among under-represented groups need to be **sensitive to managers' motivations** for offering training.

Thanks for your attention!

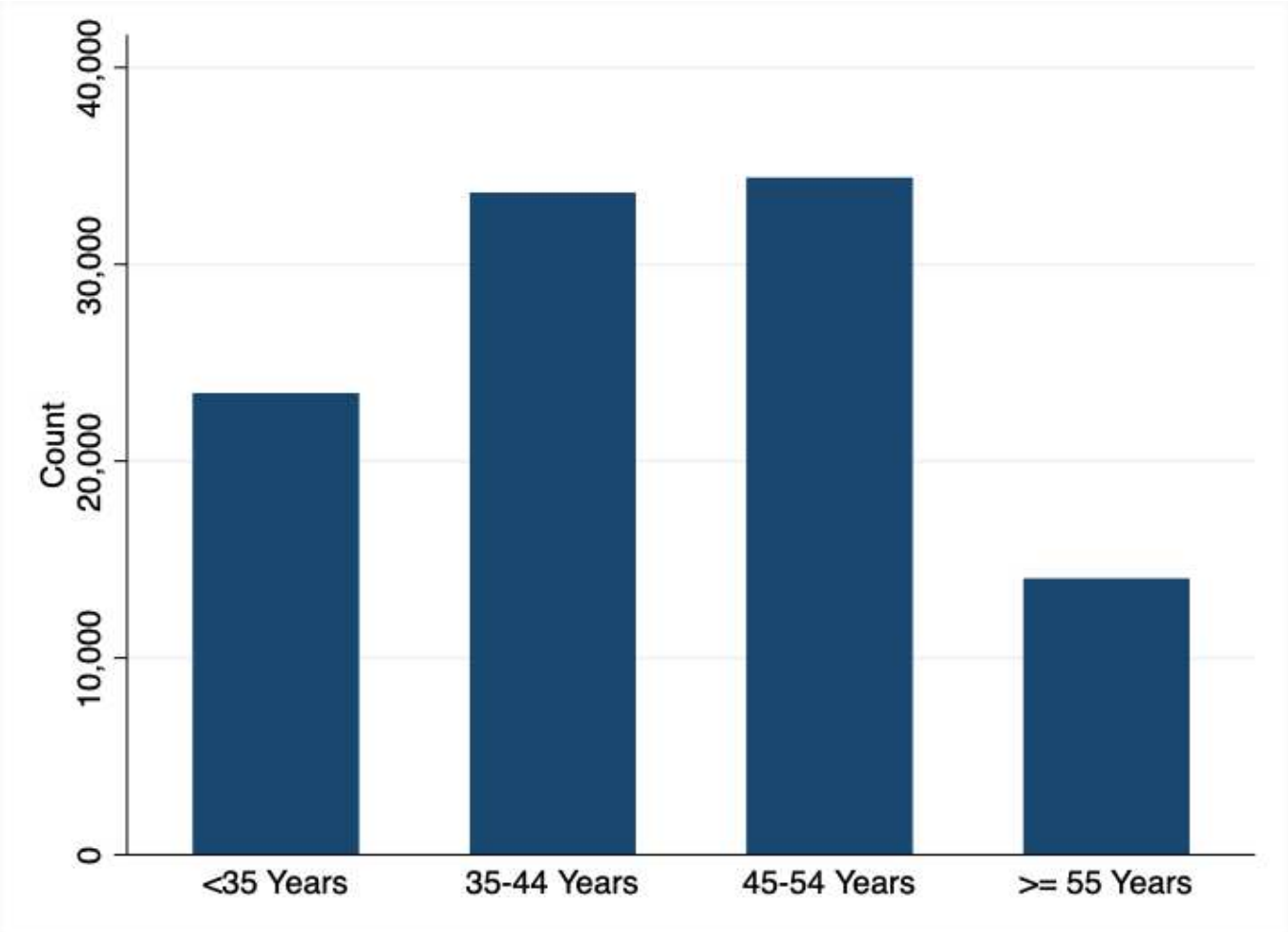
✉ sophie.wagner@uni-potsdam.de

Additional

- Age category distribution in the SOEP
- On-the-Job Training Participation: Conditional Gender Differences
- On-the-job training participation : Training Type Heterogeneity
- On-the-job training participation : Age Heterogeneity
- Background Characteristics – Firms
- Differences: Male - Female Managers
- Proportional Frequencies and Choices Made
- Possible values of vignette attributes
- Average Marginal Effects Mixed Logit
- Parameter Estimates Split Sample Specification
- Average Marginal Effects Weighted Mixed Logit
- Propensity score estimation and matching quality
- Average Marginal Effects Weighted Mixed Logit without owners
- Potential Mechanism: Male versus Female dominated industry
- Potential mechanism: Tenure of the manager
- Potential mechanism: High competition firm (yes/no)
- Potential mechanisms: Collective bargaining (yes/no)

Age categories

Figure: Age category distribution SOEP



On-the-Job Training Participation: Conditional Gender Differences

	Logit Training participation		
	2000-2008	2014-2019	2000-2019
	(1)	(2)	(3)
Female	-0.166***	0.004	-0.038
Age			
<35 Years	0.704***	0.041	0.211***
35-44 Years	0.615***	0.156**	0.256***
45-54 Years	0.422***	0.153***	0.198***
$\geq$ 55 Years	Ref.	Ref.	Ref.
Risk-affinity	0.071**	0.006	0.023
Locus of control	0.188***	0.069***	0.100***
Controls	yes	yes	yes
Number of Observations	17,545	38,625	56,170
Log-Likelihood	-8,699	-21,088	-29,941

Source: Socio-Economic Panel (SOEP), version 36. Own calculations.
Note: Control variables include information on socio-demographics, firm and occupation characteristics and personality traits, as well as yearly dummy variables.
***/**/* indicate statistical significance at the 1%/5%/10%-level.

On-the-Job Training Participation: Training Type Heterogeneity

	Logit Training participation			
	Employer-financed (1)	Self-financed (2)	General (3)	Specific (4)
Female	-0.429***	0.534***	-0.092	-0.174***
Controls	yes	yes	yes	yes
Number of Observations	6,228	6,228	17,545	17,545
Log-Likelihood	-2,169	-2,175	-7,075	-5,212

Source: Socio-Economic Panel (SOEP), version 36. Own calculations.
Note: Control variables include information on socio-demographics, firm and occupation characteristics and personality traits, as well as yearly dummy variables.
***/**/* indicate statistical significance at the 1%/5%/10%-level.

On-the-Job Training Participation: Age Heterogeneity

	Logit Training participation		
	2000-2008 (1)	2014-2019 (2)	2000-2019 (3)
Female	-0.220*	0.175**	0.115
Age			
<35 Years	0.768***	0.203*	0.373***
35-44 Years	0.613***	0.299***	0.383***
45-54 Years	0.337***	0.234***	0.251***
≥ 55 Years	Ref.	Ref.	Ref.
Interacted with female by:			
Age			
<35 Years	-0.076	-0.274**	-0.276***
35-44 Years	0.037	-0.248**	-0.223***
45-54 Years	0.196	-0.145	-0.095
Controls	Yes	Yes	Yes
Number of Observations	17,545	38,625	56,170
Log-Likelihood	-8,695	-21,080	-29,930

Source: Socio-Economic Panel (SOEP), version 36. Own calculations.
Note: Control variables include information on socio-demographics, firm and occupation characteristics and personality traits, as well as yearly dummy variables.
***/**/* indicate statistical significance at the 1%/5%/10%-level.

Background Characteristics: Firms

	Mean	SD	Min	Max
On-the-Job Training (yes=1)	0.77	0.42	0	1
Firmsize	88.25	235.30	1	2,600
Firmsize				
Firmtype:				
Autonomous Holding	0.07	0.26	0	1
Independent Operation	0.09	0.29	0	1
Coorperate Headquarter	0.05	0.22	0	1
Branch Office	0.05	0.21	0	1
Foundation	0.22	0.42	0	1
Something Different	0.40	0.49	0	1
Insitutional:				
Work Council	0.10	0.31	0	1
Collective Bargaining Coverage	0.67	0.47	0	1
Export-oriented	0.25	0.43	0	1
High Competition	0.34	0.47	0	1
Training Cooperations	0.58	0.49	0	1
Flexible Working Hours	0.02	0.13	0	1
Firm Sector:				
Agriculture	0.08	0.27	0	1
Electricity	0.08	0.27	0	1
Water Supply	0.16	0.37	0	1
Construction	0.03	0.16	0	1
Wholesale, Retail Trade	0.07	0.25	0	1
Transportation	0.04	0.19	0	1
Finance and Insurance	0.10	0.29	0	1
Real Estate Activities	0.07	0.25	0	1
Public Administration	0.12	0.32	0	1
Education	0.01	0.09	0	1
Human Health, Social Work	0.06	0.23	0	1
Arts, Recreation	0.08	0.28	0	1
Observations	1,144			

Source: BIBB-CBS 2017/2018, own calculations.

back

Differences : Male and Female Managers

	Manager			
	All (1)	Female (2)	Male (3)	ttest (4)
Gender				
Male	0.57	0.00	1.00	.
Female	0.43	1.00	0.00	.
Firm Position				
Owner	0.35	0.19	0.48	0.00
CEO	0.13	0.10	0.16	0.00
Department Head	0.07	0.06	0.08	0.39
Head HR	0.17	0.29	0.09	0.00
Head Commerce	0.08	0.09	0.08	0.46
Head of Training	0.07	0.09	0.05	0.01
Other Position	0.11	0.18	0.07	0.00
Qualification				
No Vocational Training	0.01	0.00	0.01	0.31
Vocational Training	0.21	0.28	0.15	0.00
Advanced Voc Degree	0.35	0.28	0.40	0.00
Academic Degree	0.44	0.44	0.44	1.00
Firm Tenure in Years	14.55	12.71	15.92	0.00
Risk-Affinity	5.47	5.25	5.63	0.00
Number of Employees	88.25	102.70	77.41	0.07
Small Firm (1-49)	0.70	0.63	0.75	0.00
Large Firm (50+)	0.30	0.37	0.25	0.00
Export Oriented	0.10	0.09	0.12	0.08
High Competition	0.67	0.67	0.67	0.97
Labor Market Tightness	3.89	3.71	4.02	0.00
Number of Observations	1,144	490	654	1,144

back

Proportional frequencies and choices made

		Manager			
	Alternatives (1)	All (2)	Male (3)	Female (4)	ttest (5)
Gender					
Male	0.50	0.48	0.48	0.48	1.00
Female	0.50	0.52	0.52	0.52	1.00
Age					
25 Years Old	0.25	0.28	0.29	0.28	0.39
35 Years Old	0.25	0.28	0.28	0.28	0.46
45Years Old	0.25	0.25	0.25	0.25	0.83
55 Years Old	0.25	0.19	0.18	0.20	0.07
Professional Competency					
Below Average	0.33	0.26	0.26	0.26	0.70
Average Prof Competencies	0.33	0.34	0.33	0.35	0.08
Above Average	0.34	0.40	0.41	0.39	0.06
Job Mobility					
Never Changed Employer	0.33	0.41	0.41	0.41	1.00
1 Time Changed Employer	0.33	0.33	0.33	0.33	0.84
2 Times Changed Employer	0.34	0.26	0.26	0.26	0.84
Usability in other Firms					
Only Usable in Firm	0.32	0.37	0.37	0.37	0.65
Partly	0.34	0.32	0.32	0.32	0.66
Completely	0.34	0.31	0.31	0.31	0.97
Training Duration					
Takes 2 Working Days	0.34	0.37	0.36	0.38	0.04
Takes 5 Working Days	0.33	0.34	0.34	0.33	0.56
Takes 10 Working Days	0.33	0.29	0.30	0.28	0.14
Cost Coverage by the Employer					
0 Percent	0.34	0.35	0.34	0.36	0.12
50 Percent	0.33	0.34	0.33	0.34	0.35
100 Percent	0.33	0.32	0.33	0.30	0.01
Number of Observations	1,144	1,144	654	490	1,144

Source: BIBB-CBS 2017/2018. Own calculations.

back

Possible values of vignette attributes

Attribute	Attribute Values
	The skilled worker ...
Gender	(1) ... is male. (2) ... is female.
Age	(1) ... is 25 years old. (2) ... is 35 years old. (3) ... is 45 years old. (4) ... is 55 years old.
Occupational Experience	(1) ... has below average occupational experience. (2) ... has average occupational experience. (3) ... has above average occupational experience.
Occupational Mobility	(1) ... never changed employer within the last 5 years. (2) ... 1 time changed employer within the last 5 years. (3) ... 2 times changed employer within the last 5 years.
	The training ...
Content	(1) ... is only useable in your firm and not in other firms. (2) ... is partly useable also in other firms. (3) ... is completely useable also in other firms.
Duration	(1) ... takes 2 working days. (2) ... takes 5 working days. (3) ... takes 10 working days.
Cost Coverage	(1) ... is not covered by the employer. 100% of costs are taken over by the participant. (2) ... is covered by 50% of the employer. The participant takes over the remaining 50% of the costs. (3) ... is covered by 100% of the employer. The participant has no costs.

back

Average Marginal Effects

	All Decision Makers		Only Female Decision Makers		Only Male Decision Makers	
	ME (1)	SE (2)	ME (3)	SE (4)	ME (5)	SE (6)
Age						
25 Years Old	-0.0580*	(0.0341)	-0.0983**	(0.0493)	-0.0175	(0.0476)
35 Years Old	0.0085	(0.0307)	0.0056	(0.0527)	-0.0075	(0.0427)
45 Years Old	0.0312	(0.0308)	0.0742*	(0.0464)	-0.0195	(0.0445)
55 Years Old	0.0357	(0.0392)	0.0696	(0.0459)	-0.0069	(0.0443)
Professional Competency						
Above Average	0.0753**	(0.0350)	0.0853*	(0.0415)	0.0542	(0.0505)
Average	0.0631**	(0.0301)	0.1373***	(0.0491)	-0.0028	(0.0429)
Below Average	0.0377	(0.0305)	0.0716	(0.0454)	-0.0065	(0.0462)
Job Mobility	0.0016	(0.0382)	0.0085	(0.0493)	-0.0161	(0.0408)
Usability in other Firms						
Completely	0.0507	(0.0340)	0.0443	(0.0430)	0.0430	(0.0474)
Partly	0.0354	(0.0383)	0.0055	(0.0501)	0.0470	(0.0432)
Only Usable in Firm	0.0332	(0.0363)	0.0649	(0.0485)	-0.0057	(0.0397)
Training Duration	0.0612**	(0.0251)	0.0916**	(0.0440)	0.0333	(0.0365)
Cost Coverage by the Employer						
100 Percent	-0.0400	(0.0329)	0.0706	(0.0470)	-0.0970***	(0.0453)
50 Percent	0.0161	(0.0314)	0.1031**	(0.0506)	-0.0717*	(0.0408)
0 Percent	0.0340	(0.0274)	0.0662	(0.0492)	-0.0069	(0.0411)
Number of Observations	13,494		5,812		7,682	

Source: BIBB-CBS 2017/2018. Own calculations.
Note: ***/**/* indicate statistical significance at the 1%/5%/10%-level. Estimation based on 300 scrambled Halton draws.

back1 back2

Split-Sample Specification: Parameter Estimates

back

	Only Female Managers Mixed Logit		**Only Male Managers** Mixed Logit	
	Mean (1)	Int. with Female (2)	Mean (3)	Int. with Female (4)
Female	0.418		-0.040	
Age				
25 Years Old	1.123***	-0.947***	1.041***	-0.076
35 Years Old	0.802***	-0.384	0.962***	-0.009
45 Years Old	0.527***	0.039	0.704***	-0.083
Occupational Experience				
Above Average	0.769***	0.146	0.660***	0.432
Average	0.209	0.479*	0.573***	0.023
Job Mobility	-0.360***	-0.260*	-0.513***	-0.043
Usability in other Firms				
Completely	-0.498***	-0.145	-0.765***	0.325
Partly	-0.239	-0.384	-0.702***	0.351
Training Duration	-0.076***	0.020	-0.063***	0.036
Cost Coverage by the Employer				
100 Percent	-0.305*	0.020	0.157	-0.607**
50 Percent	-0.115	0.235	0.288*	-0.444*
Number of Observations		5,812		7,682
Log-Likelihood		-1,746		-2,271

Source: BIBB-CBS 2017/2018. Own calculations.

Note: ***/**/* indicate statistical significance at the 1%/5%/10%-level. Estimation based on 300 scrambled Halton

Average Marginal Effects: Weighted Regression

	Only Female Decision Makers		Only Male Decision Makers	
	ME (1)	SE (2)	ME (3)	SE (4)
Age				
25 Years Old	-0.1341***	(0.0507)	0.0132	(0.1131)
34 Years Old	-0.0178	(0.0482)	0.1492	(0.1089)
45 Years Old	0.0550	(0.0488)	0.0880	(0.1039)
55 Years Old	0.0297	(0.0447)	0.0790	(0.1085)
Occupational Experience				
Below Average	0.0306	(0.0454)	0.0848	(0.1159)
Average	0.1415***	(0.0405)	0.0882	(0.0865)
Above Average	0.0755	(0.0529)	0.0918	(0.0979)
Job Mobility	-0.0284	(0.0419)	0.0479	(0.0777)
Usability in other Firms				
Not transferable	0.0276	(0.0402)	0.0734	(0.1016)
Partly	-0.0521	(0.0452)	0.0416	(0.0779)
Completely	0.0282	(0.0404)	0.0398	(0.0859)
Training Duration	0.0628*	(0.0379)	0.1913**	(0.0969)
Cost Coverage by the Employer				
100 Percent	0.0408	(0.0469)	-0.0624	(0.1067)
50 Percent	0.0634	(0.0457)	-0.0721	(0.1023)
0 Percent	0.0282	(0.0414)	0.0747	(0.1036)
Number of Observations		4,944		6,742

Source: BIBB-CBS 2017/2018. Own calculations.
Note: ***/**/* indicate statistical significance at the 1%/5%/10%-level. Estimation based on 300 scrambled Halton draws.

back

Additional - Matching Quality (1/4)

back

	Logit	MSB (% bias)			
	P(*female* = 1)	Unmatched	Matched	t-test	p-value
	(1)	(2)	(3)	(4)	(5)
Firm Position:					
Owner	-2.216***	-65.4	-5.1	-2.77	0.006
CEO	-1.683***	-25.2	-1.7	-0.96	0.336
Department Head	-1.034***	-3.4	-3.7	-1.82	0.069
Head HR	0.685***	58.6	5.8	2.33	0.020
Head Commerce	-0.716***	7.0	0.3	-0.17	0.867
Head of Training	-0.3212***	16.2	-0.4	-0.17	0.867
Other Position	Ref.	35.1	5.4	2.25	0.025
Firm Tenure in Years	0.002	-30.7	3.9	1.95	0.051
Educational Status:					
No Vocational Degree	-1.693***	-8.6	-0.9	-0.62	0.536
Vocational Degree	0.551***	32.0	12.0	5.45	0.000
Advanced Voc. Degree	-0.135**	-24.6	-3.1	-1.56	0.118
Academic Degree	Ref.	-1.6	-6.8	-3.31	0.001
Firm's Training Decision:					
Alone	-1.359***	-46.4	-4.7	-2.53	0.011
Together	-1.033***	-6.8	-6.4	-3.13	0.002
Support	-0.689***	37.2	13.4	5.89	0.000
Not Involved	Ref.	36.7	1.2	0.46	0.647

Source: BIBB-CBS 2017/2018. Own calculations.
Note: ***/**/* indicate statistical significance at the 1%/5%/10%-level.

Additional - Matching Quality (1/4)

back

	Logit	MSB (% bias)			
	P(*female* = 1)	Unmatched	Matched	t-test	p-value
	(1)	(2)	(3)	(4)	(5)
Firm Position:					
Owner	-2.216***	-65.4	-5.1	-2.77	0.006
CEO	-1.683***	-25.2	-1.7	-0.96	0.336
Department Head	-1.034***	-3.4	-3.7	-1.82	0.069
Head HR	0.685***	58.6	5.8	2.33	0.020
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Support	-0.689***	37.2	13.4	5.89	0.000
Not Involved	Ref.	36.7	1.2	0.46	0.647

Source: BIBB-CBS 2017/2018. Own calculations.
Note: ***/**/* indicate statistical significance at the 1%/5%/10%-level.

Additional - Matching Quality (1/4)

back

	Logit	MSB (% bias)			
	P(*female* = 1)	Unmatched	Matched	t-test	p-value
	(1)	(2)	(3)	(4)	(5)
Firm Position:					
Owner	-2.216***	-65.4	-5.1	-2.77	0.006
CEO	-1.683***	-25.2	-1.7	-0.96	0.336
Department Head	-1.034***	-3.4	-3.7	-1.82	0.069
Head HR	0.685***	58.6	5.8	2.33	0.020
Head Commerce	-0.716***	7.0	0.3	-0.17	0.867
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Other Position	Ref.	35.1	5.4	2.25	0.025
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Educational Status:					
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Vocational Degree	0.551***	32.0	12.0	5.45	0.000
Advanced Voc. Degree	-0.135**	-24.6	-3.1	-1.56	0.118
Academic Degree	Ref.	-1.6	-6.8	-3.31	0.001
Firm's Training Decision:					
Alone	-1.359***	-46.4	-4.7	-2.53	0.011
Together	-1.033***	-6.8	-6.4	-3.13	0.002
Support	-0.689***	37.2	13.4	5.89	0.000
Not Involved	Ref.	36.7	1.2	0.46	0.647

Source: BIBB-CBS 2017/2018. Own calculations.
Note: ***/**/* indicate statistical significance at the 1%/5%/10%-level.

Additional - Matching Quality (1/4)

back

	Logit	MSB (% bias)			
	P(*female* = 1)	Unmatched	Matched	t-test	p-value
	(1)	(2)	(3)	(4)	(5)
Firm Position:					
Owner	-2.216***	-65.4	-5.1	-2.77	0.006
CEO	-1.683***	-25.2	-1.7	-0.96	0.336
Department Head	-1.034***	-3.4	-3.7	-1.82	0.069
Head HR	0.685***	58.6	5.8	2.33	0.020
Head Commerce	-0.716***	7.0	0.3	-0.17	0.867
Head of Training	-0.3212***	16.2	-0.4	-0.17	0.867
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Firm Tenure in Years	0.002	-30.7	3.9	1.95	0.051
Educational Status:					
No Vocational Degree	-1.693***	-8.6	-0.9	-0.62	0.536
Vocational Degree	0.551***	32.0	12.0	5.45	0.000
Advanced Voc. Degree	-0.135**	-24.6	-3.1	-1.56	0.118
Academic Degree	Ref.	-1.6	-6.8	-3.31	0.001
Firm's Training Decision:					
Alone	-1.359***	-46.4	-4.7	-2.53	0.011
Together	-1.033***	-6.8	-6.4	-3.13	0.002
Support	-0.689***	37.2	13.4	5.89	0.000
Not Involved	Ref.	36.7	1.2	0.46	0.647

Source: BIBB-CBS 2017/2018. Own calculations.
Note: ***/**/* indicate statistical significance at the 1%/5%/10%-level.

Additional - Matching Quality (2/4)

	Logit	MSB (% bias)			
	P(*female* = 1)	Unmatched	Matched	t-test	p-value
	(1)	(2)	(3)	(4)	(5)
Reciprocity	-0.164***	-17.6	12.6	5.58	0.000
Internal Locus of Control	-0.058*	-6.5	-2.2	-1.11	0.266
Big Five:					
Openness	0.206***	10.5	5.8	2.89	0.004
Conscientiousness	0.343***	18.9	8.8	4.50	0.000
Extraversion	0.091***	9.8	2.2	1.07	0.282
Agreeableness	0.132***	14.1	-0.2	-0.10	0.923
Emotional Stability	-0.307***	-20.0	6.6	3.11	0.002
Number of Employees in Firm	0.000*	9.1	-7.9	-3.52	0.000
Vocational Training Provider	-0.223***	-2.2	-4.1	-2.04	0.042
Firm:					
Export-oriented	-1.044***	-17.3	1.1	0.62	0.538
High Competition	-0.036	2.0	1.3	0.63	0.530
Training Cooperations	-0.173***	-3.9	1.3	0.65	0.519
Profit Sharing	-0.215***	-3.1	-6.6	-3.21	0.001
Flexible Work Hours	0.002	5.0	-0.8	-0.42	0.677

Source: BIBB-CBS 2017/2018. Own calculations.
Note: ***/**/* indicate statistical significance at the 1%/5%/10%-level.

Additional - Matching Quality (3/4)

	Logit	MSB (% bias)			
	P(*female* = 1)	Unmatched	Matched	t-test	p-value
	(1)	(2)	(3)	(4)	(5)
Firmtype:					
Autonomous Individual Holding	0.467***	-16.5	6.6	-3.21	0.001
Independent Operation as Part of Enterprise	0.238*	7.6	2.0	0.92	0.356
Corporate Headquarter	0.275*	10.8	-2.4	-1.05	0.294
Branch Office	0.047	-0.3	-4.4	-2.09	0.037
Foundation, Institution, Authority	-0.192	4.8	3.8	1.83	0.068
Something Different	Ref.	8.5	-12.8	-5.24	0.000
Firm's Utilized Capacity	0.003	0.3	3.9	1.90	0.057
Firm Sector:					
Agriculture (A)	0.387**	-6.3	0.3	0.15	0.884
Manufacturing (C)	-0.524***	-20.6	-0.3	-0.20	0.842
Water Supply (E)	0.150	5.1	0.8	0.36	0.718
Construction (F)	-1.234***	-35.6	1.8	1.35	0.178
Wholesale, Retail Trade (G)	0.230**	-5.0	-8.4	-4.05	0.000
Transportation (H)	-0.596***	-9.7	-1.1	-0.64	0.525
Accommodation Activities (I)	0.112	0.5	-7.2	-3.31	0.001
Information Activities (J)	0.291**	9.5	0.1	0.05	0.958
Finance and Insurance (K)	0.012	2.0	-0.2	-0.09	0.931
Real Estate Activities (L)	0.471**	5.4	-3.0	-1.26	0.206
Professional Activities (M)	0.306***	0.7	9.3	4.81	0.000
Administrative Activities (N)	1.198***	18.4	-1.9	-0.81	0.421
Public Administration (O)	-0.601***	-8.2	1.6	0.93	0.351

Source: BIBB-CBS 2017/2018. Own calculations.
Note: ***/**/* indicate statistical significance at the 1%/5%/10%-level.

Additional - Matching Quality (4/4)

	Logit	MSB (% bias)			
	P(*female* = 1)	Unmatched	Matched	t-test	p-value
	(1)	(2)	(3)	(4)	(5)
Firm sector:					
Education (P)	2.646***	21.2	15.8	6.99	0.000
Human Health, Social Work (Q)	1.056***	24.3	10.8	4.89	0.000
Arts, Recreation (R)	0.501**	2.8	-2.6	-1.14	0.255
Other service Activities (S)	1.131***	10.1	-12.2	-5.02	0.000
Other Branches	Ref.	-5.0	-0.5	-0.25	0.803
Work Council	-0.638***	7.1	-10.4	-4.82	
Collective Bargaining Coverage	0.057	-4.2	-3.5	-1.71	0.087
Constant	-0.281				
Observations	11,686				
Sample	Ps R2	LR chi2	p>chi2	Mean Bias	B
Unmatched	0.278	4419.84	0.00	14.5	137.4
Matched	0.035	460.51	0.00	4.6	44.3

Source: BIBB-CBS 2017/2018. Own calculations.
Note: ***/**/* indicate statistical significance at the 1%/5%/10%-level.

Without owners

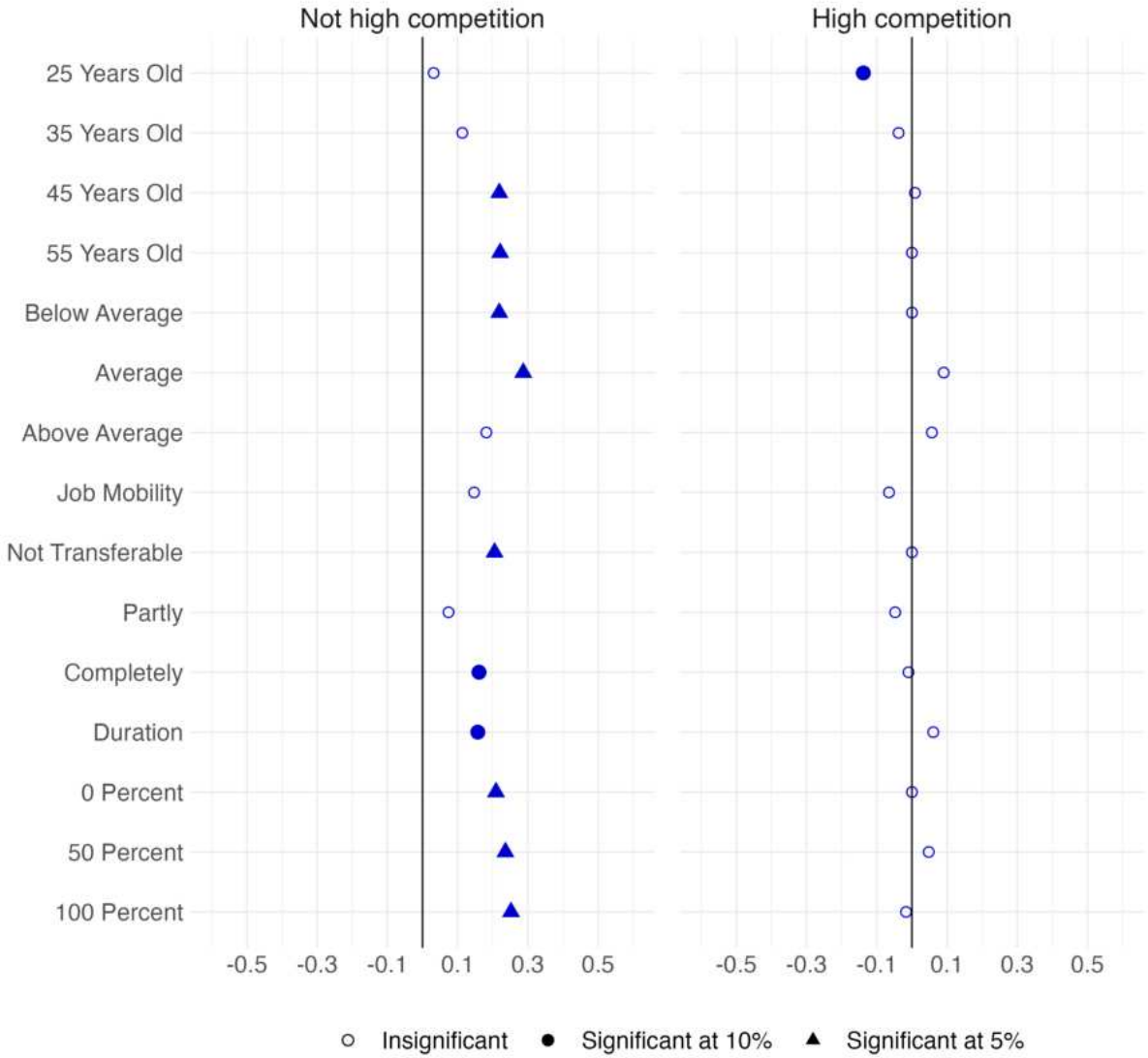
	All Decision Makers		Only Female Decision Makers		Only Male Decision Makers	
	ME	SE	ME	SE	ME	SE
	(1)	(2)	(3)	(4)	(5)	(6)
25 Years Old	0.0065	(0.0437)	-0.0965*	(0.0560)	0.0653	(0.0663)
35 Years Old	0.0326	(0.0396)	0.0157	(0.0562)	0.0322	(0.0619)
45 Years Old	0.0626	(0.0419)	0.0887	(0.0593)	0.0183	(0.0650)
55 Years Old	0.0822**	(0.0396)	0.0709	(0.0558)	0.0770	(0.0656)
Occupational Competency						
Below Average	0.0856**	(0.0406)	0.0725	(0.0563)	0.0815	(0.0677)
Average	0.1151***	(0.0404)	0.1318**	(0.0528)	0.0905	(0.0616)
Above Average	0.1124**	(0.0450)	0.0880	(0.0616)	0.1386**	(0.0673)
Job Mobility	0.0378	(0.0372)	0.0017	(0.0523)	0.0626	(0.0585)
Usability in other Firms						
Only Usable in Firm	0.0757**	(0.0357)	0.0658	(0.0517)	0.0695	(0.0582)
Partly	0.0614*	(0.0362)	-0.0159	(0.0562)	0.1390**	(0.0588)
Completely	0.0728**	(0.0319)	0.0239	(0.0472)	0.1236**	(0.0535)
Training Duration	0.0765**	(0.0338)	0.0888*	(0.0482)	0.0539	(0.0545)
Cost Coverage by the Employer						
0 Percent	0.0778**	(0.0370)	0.0670	(0.0524)	0.0721	(0.0617)
50 Percent	0.0605	(0.0413)	0.0975*	(0.0580)	-0.0335	(0.0683)
100 Percent	0.0282	(0.0427)	0.0925	(0.0590)	-0.0997	(0.0699)
Number of Observations	8,874		4,816		4,058	

Source: BIBB-CBS 2017/2018. Own calculations.
Note: ***/**/* indicate statistical significance at the 1%/5%/10%-level. Estimation based on 300 scrambled Halton draws.

back

Product market competition I

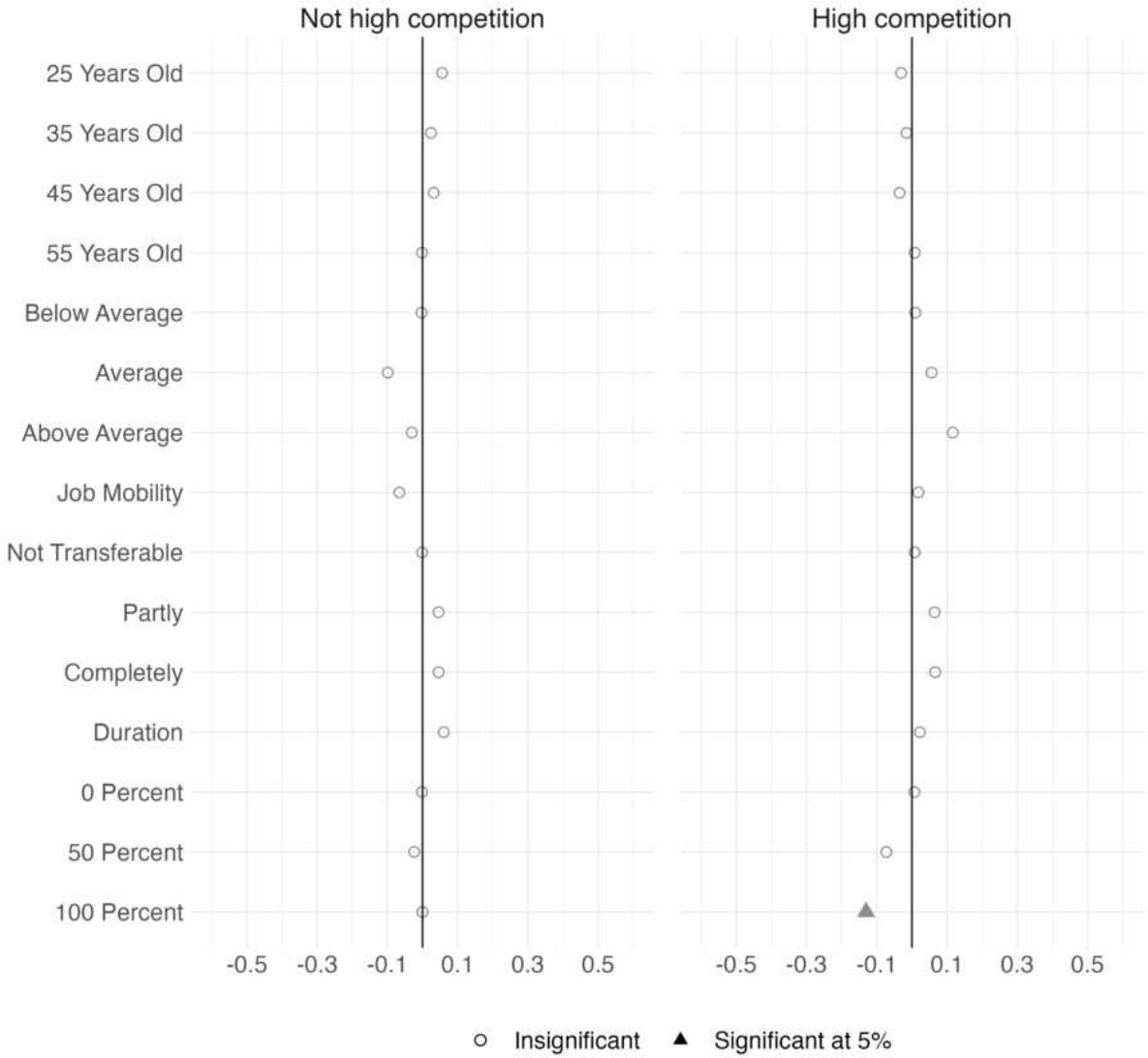
Figure: Gender gap in training offers of female managers back



Product market competition II

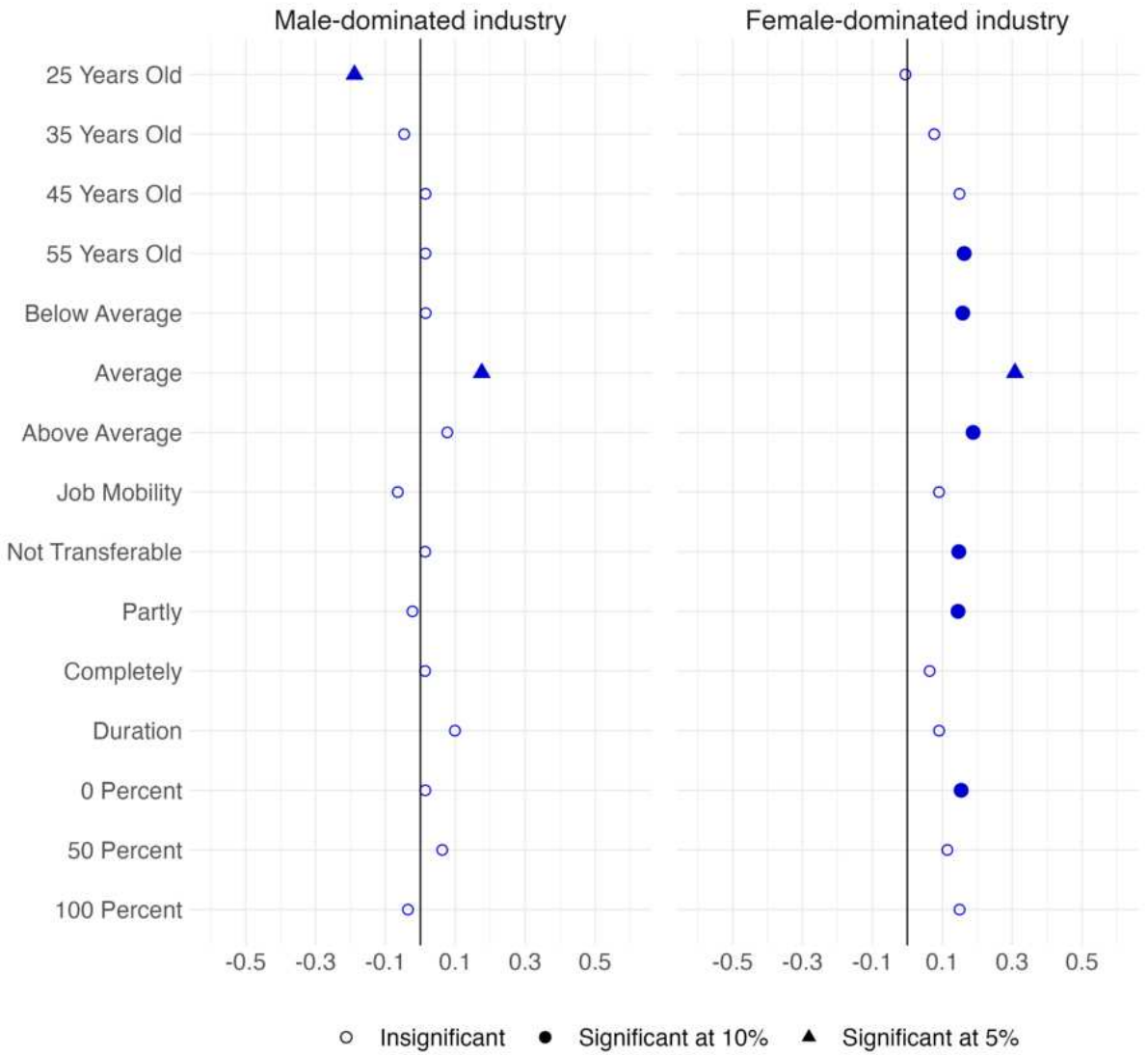
Figure: Gender gap in training offers of male managers

back



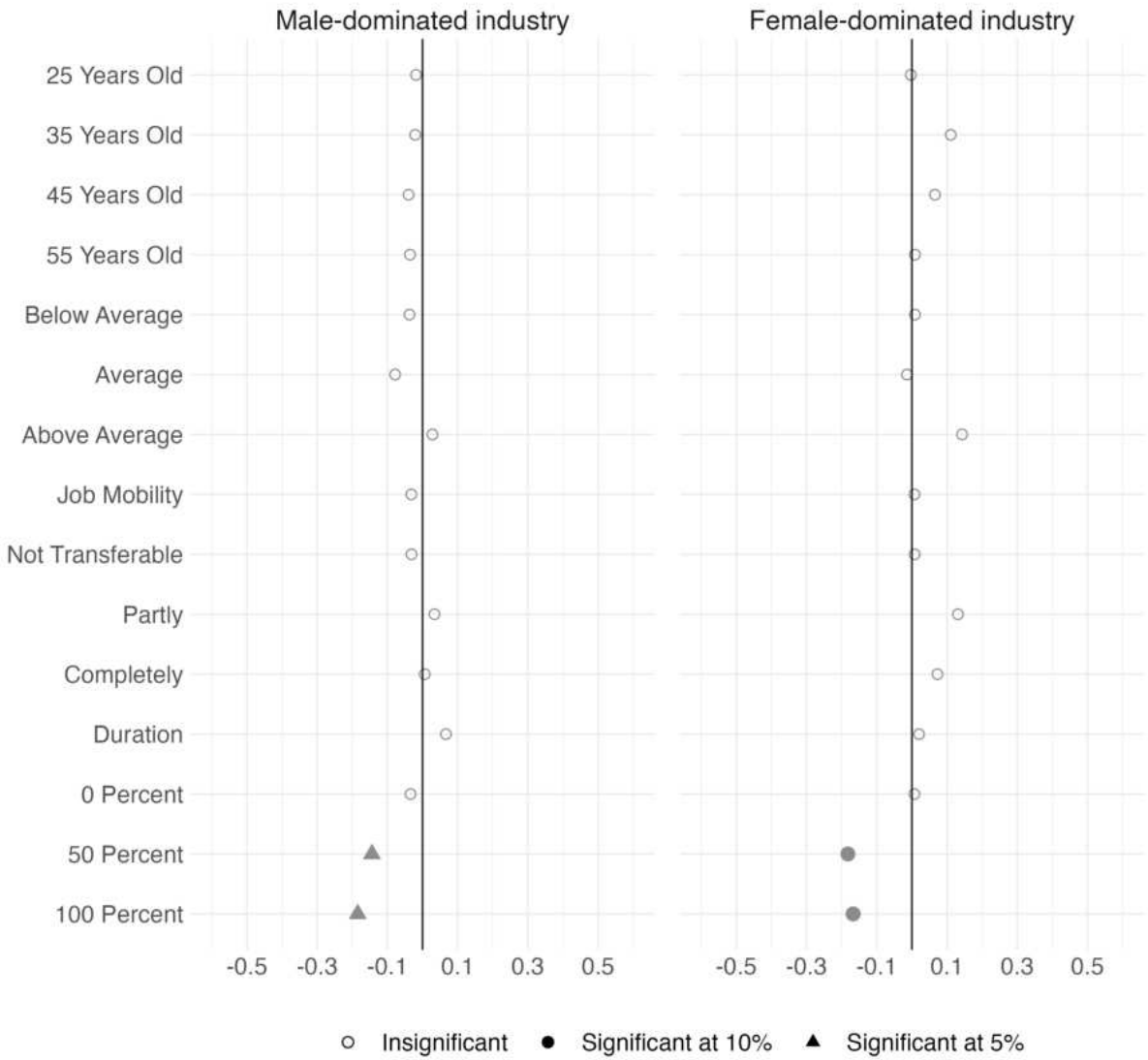
Male versus female dominated industries I

Figure: Gender gap in training offers of female managers back



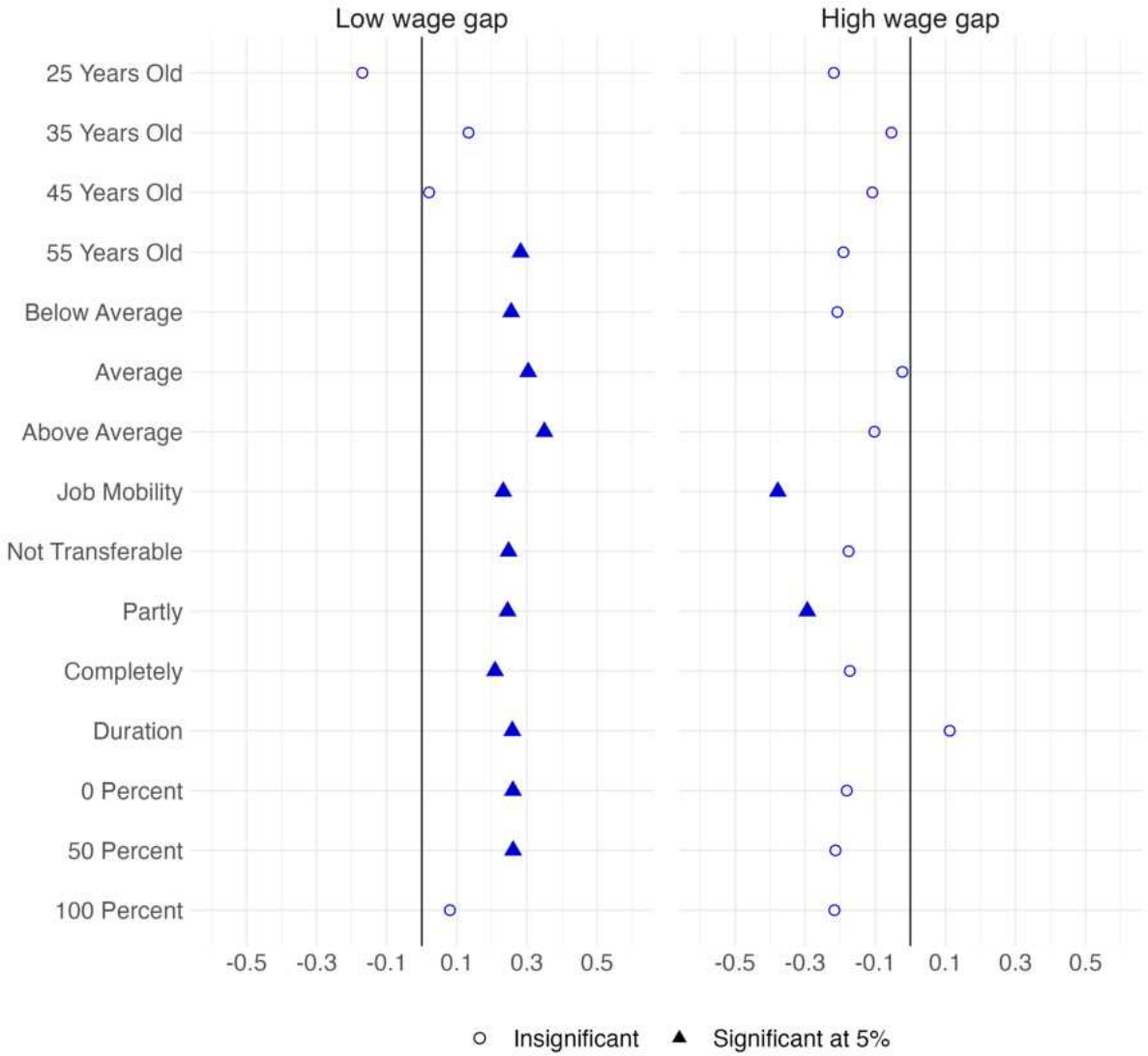
Male versus female dominated industries II

Figure: Gender gap in training offers of male managers back



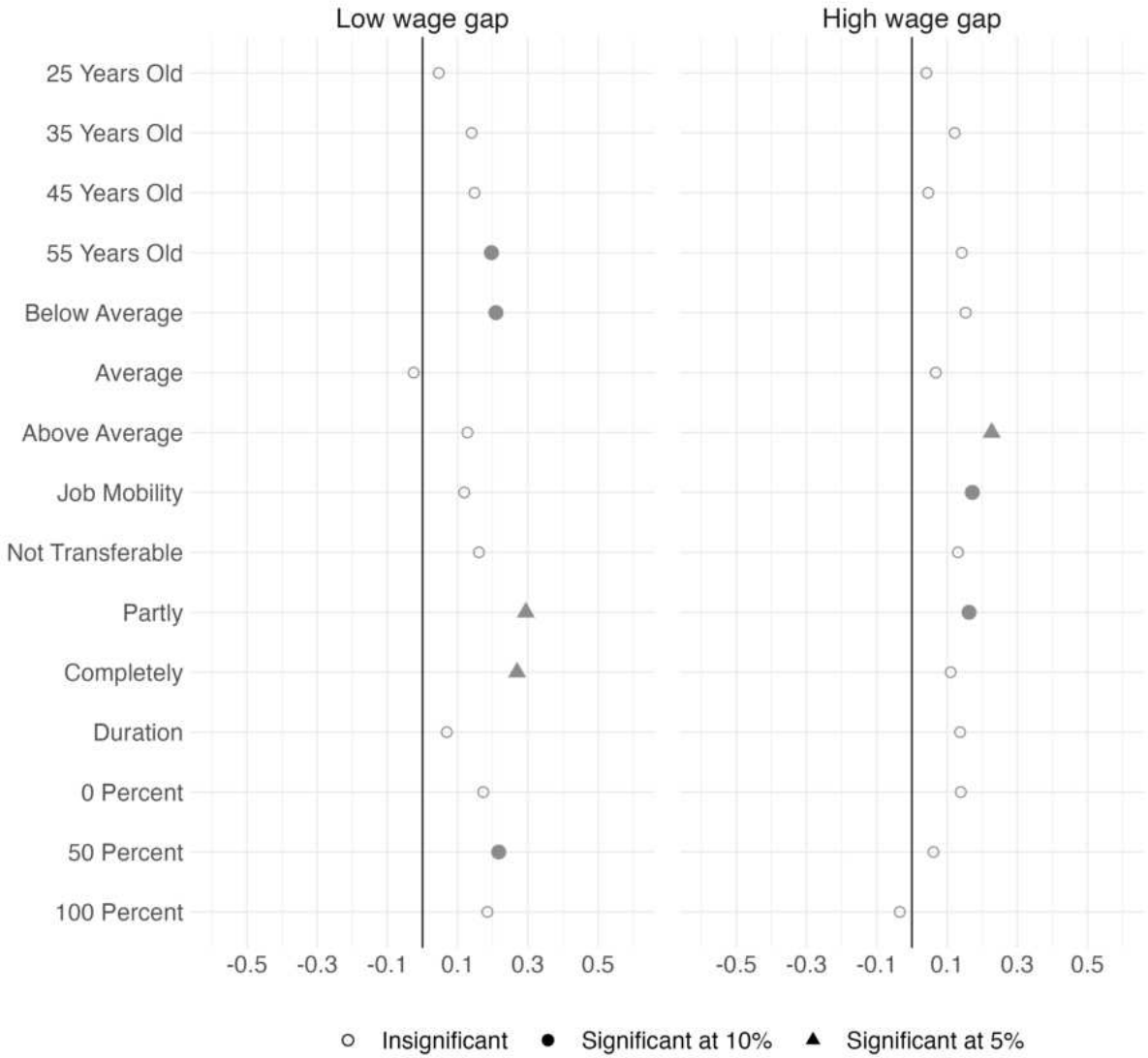
Workplace culture I

Figure: Gender gap in training offers of female managers back



Workplace culture II

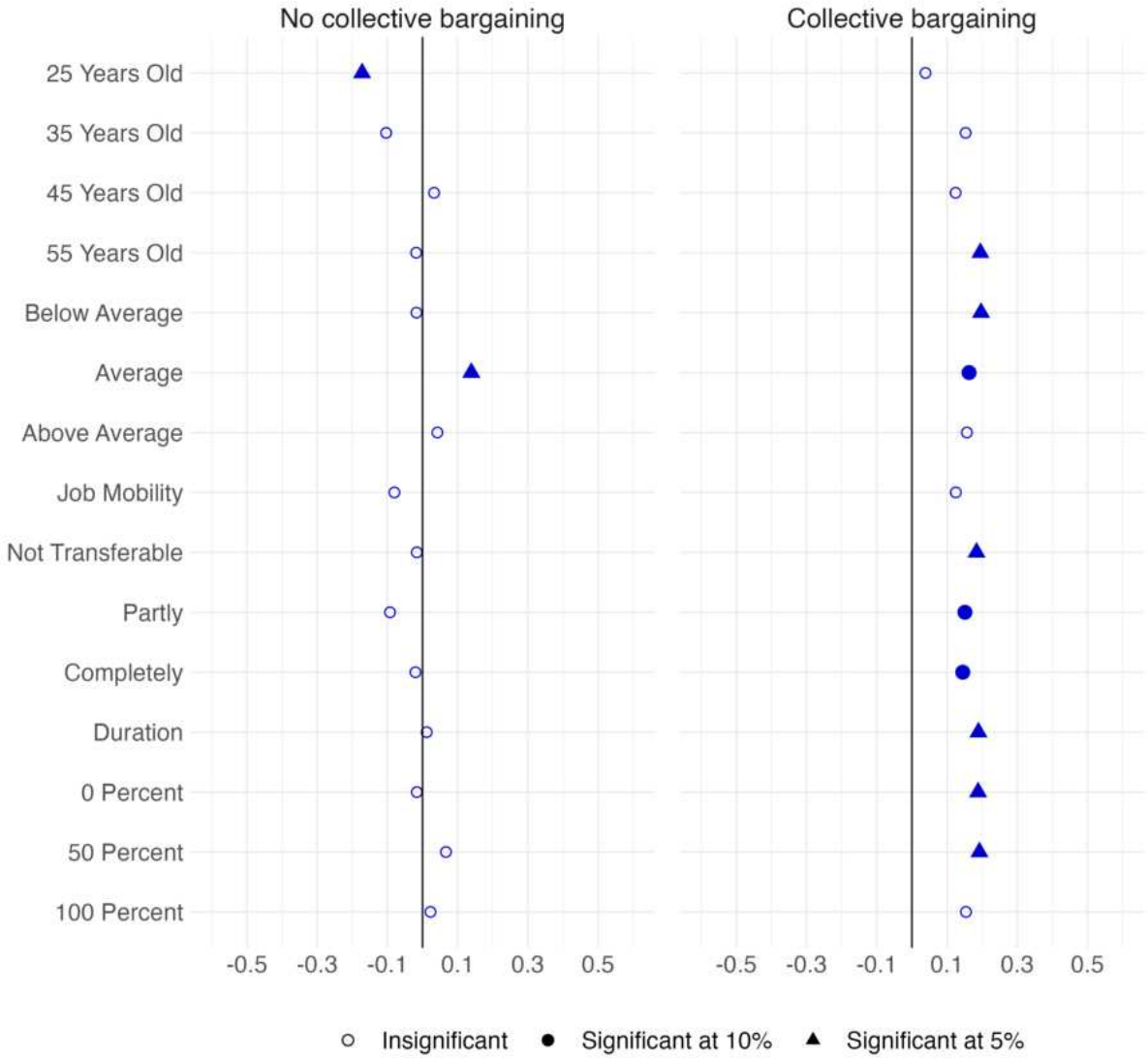
Figure: Gender gap in training offers of male managers back



Collective bargaining I

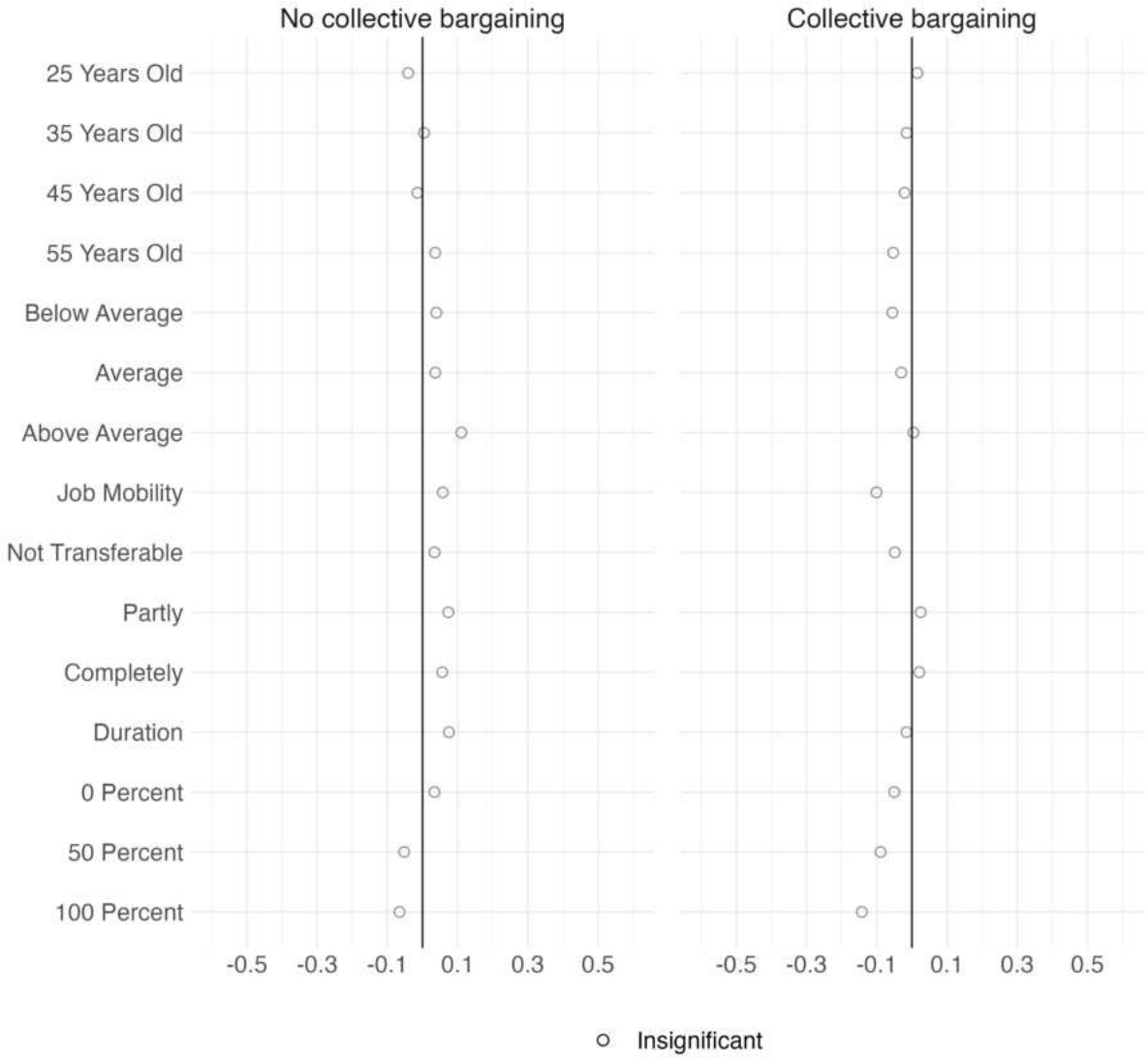
Figure: Gender gap in training offers of female managers

back



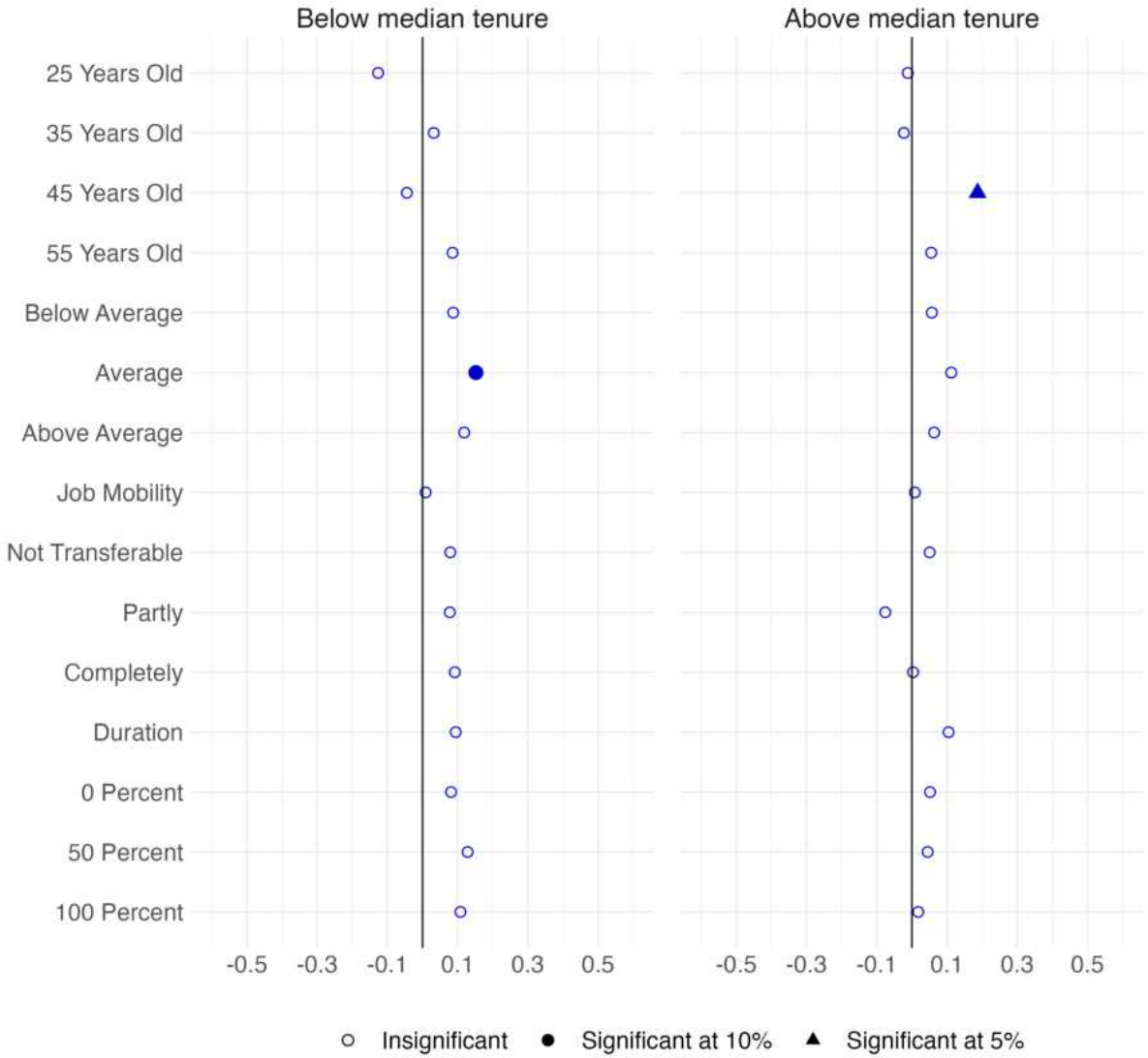
Collective bargaining II

Figure: Gender gap in training offers of male managers back



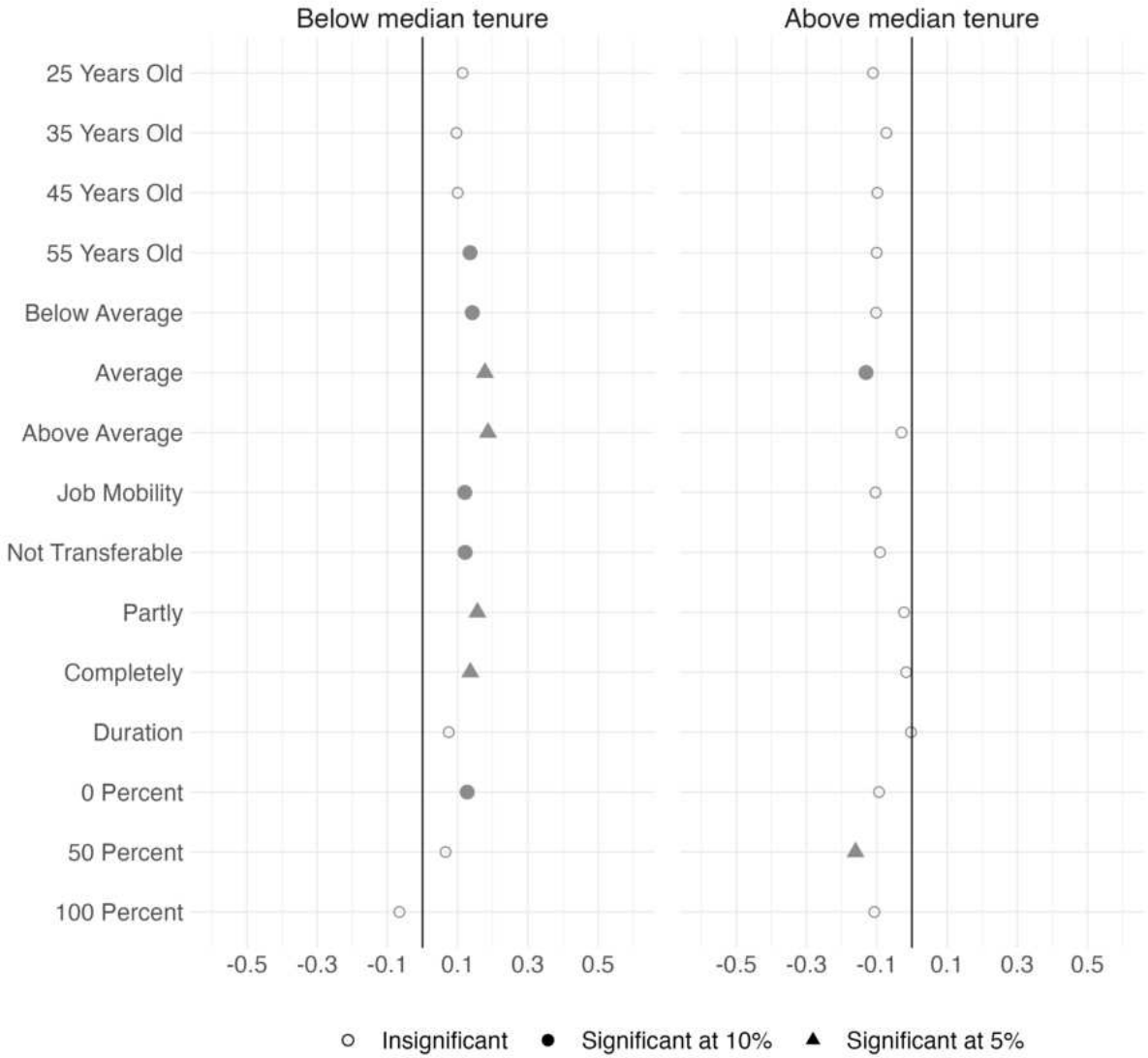
Firm Tenure I

Figure: Gender gap in training offers of female managers back



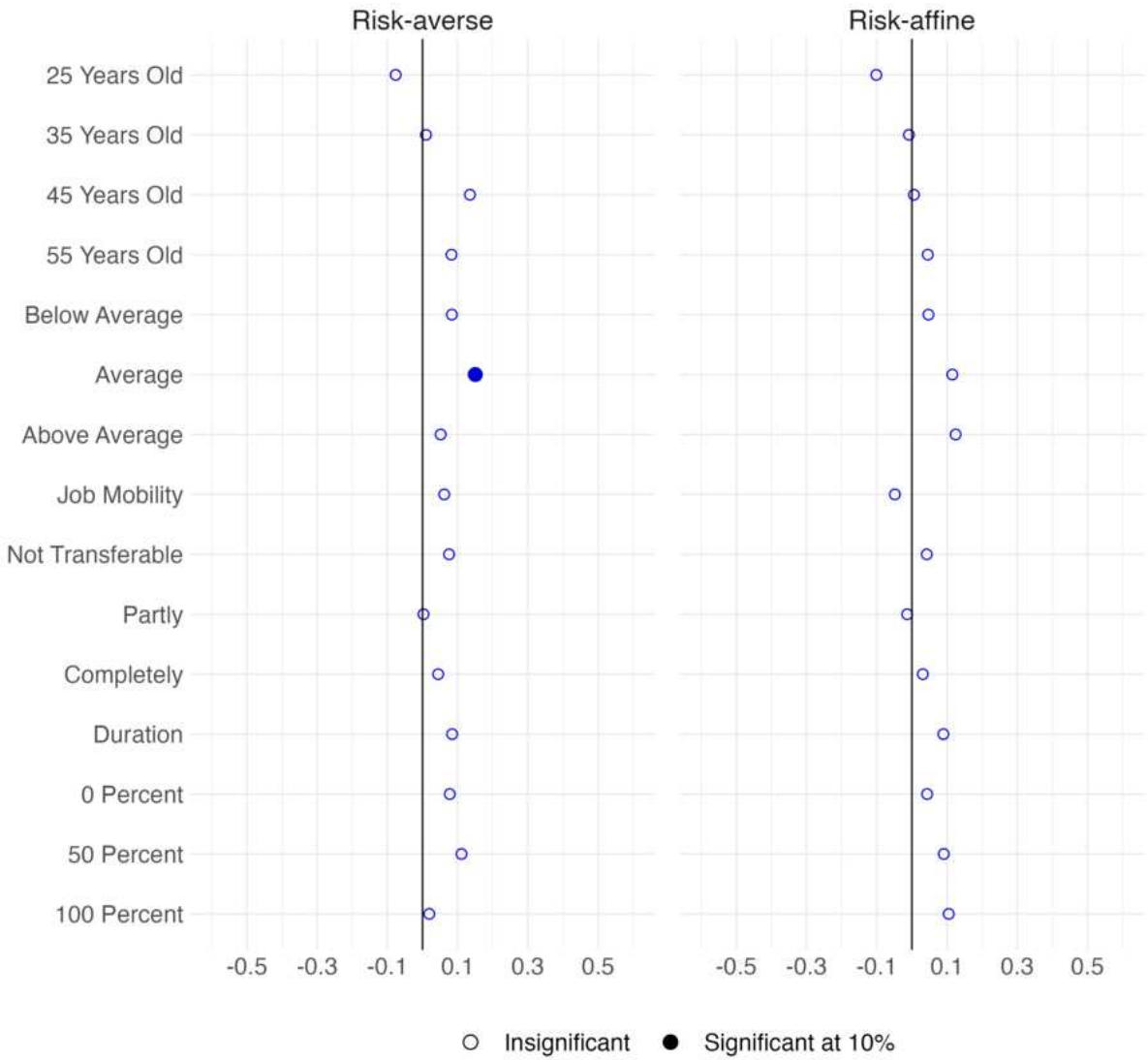
Firm Tenure II

Figure: Gender gap in training offers of male managers back



Risk Aversion I

Figure: Gender gap in training offers of female managers back



Risk Aversion II

Figure: Gender gap in training offers of male managers back