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Combining educational and labor market segregation:

The effect of sex segregation and concentration of field of study
on the gender wage gap

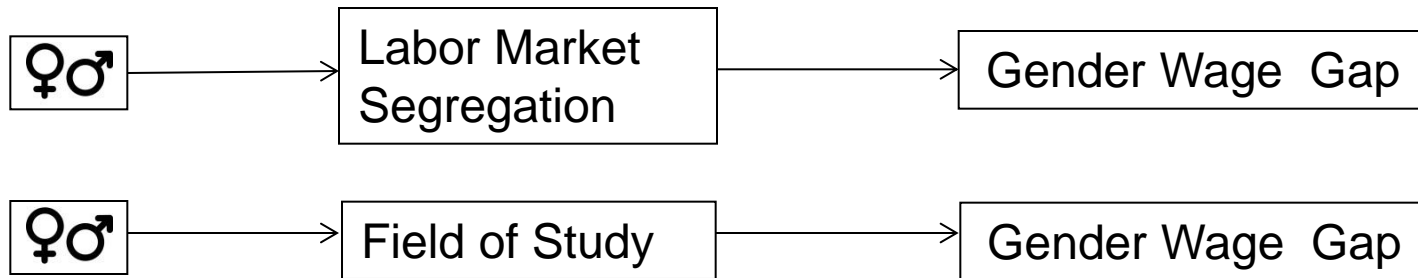
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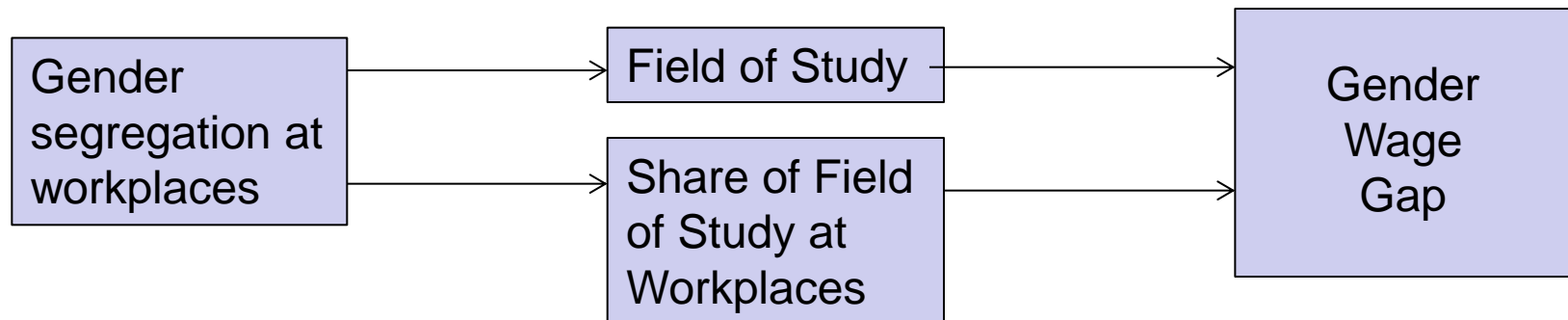
Motivation

- There is a persisting gender wage gap for academics of about 20 percent (e.g. Leuze & Strauß, 2009; Falk et al., 2014).
- Explanations focus on various topics that could be a cause for the gender wage gap, some examples are:
 - motherhood wage penalty (Beblo & Wolf, 2003),
 - company specific characteristics (Achatz et al., 2005),
 - segregation (Leuze & Strauß, 2009), etc.
- Women in female dominated fields/jobs earn less than in male dominated fields/jobs (e.g. Leuze & Strauß, 2009).
- Within male dominated labor markets the gender wage gap is bigger than within mixed or female dominated labor markets (Falk et al., 2014).

Motivation



- Missing link between fields of study and labor market segregation



Theoretical perspective

Human Capital

- Gender segregation into different workplaces (Becker, 1985)
- Anticipation of human capital devaluation through employment interruptions of women (Becker, 1991; Mincer & Polachek, 1974)
- Women acquire less firm- or occupation-specific human capital (Estévez-Abe, 2005; Ochsensfeld, 2014)
- Different types of educational resources (van de Werfhorst, 2002): communicative, cultural, economic and technical resources
 - Do women self-select into low-paid fields of study with communicative or cultural resources?
 - Do men self-select into fields of study with high-paid economic or technical resources?
 - Do interdisciplinary workplaces devalue educational resources?

Hypotheses

- H1: The greater the percentage share of men at the workplace, the more pronounced is the gender wage gap.
- H2: Individuals with general resources earn less than individuals with specialized resources.
- H3: Individuals working at interdisciplinary workplaces earn less than individuals with a greater part of colleagues with the same field of study.
- H4a: The gender wage gap is more pronounced, because women more often have general resources.
- H4b: The gender wage gap can be reduced if women more often have economic resources.
- H4c: The gender wage gap can be reduced if women more often have technical resources.
- H5: Because women are more often employed at interdisciplinary workplaces, the gender wage gap is more pronounced.

Data

- Data: Bavarian Graduate Panel (BAP)
- Cohort: 2005/06 (first and second wave)
- Response rate: first wave: 38 %; second wave: 69 %
- Sample restrictions:
no self-employed or unemployed individuals, first two jobs after graduation, listwise deletion of missings
- N = 2560 (men = 1377; women: 1183)

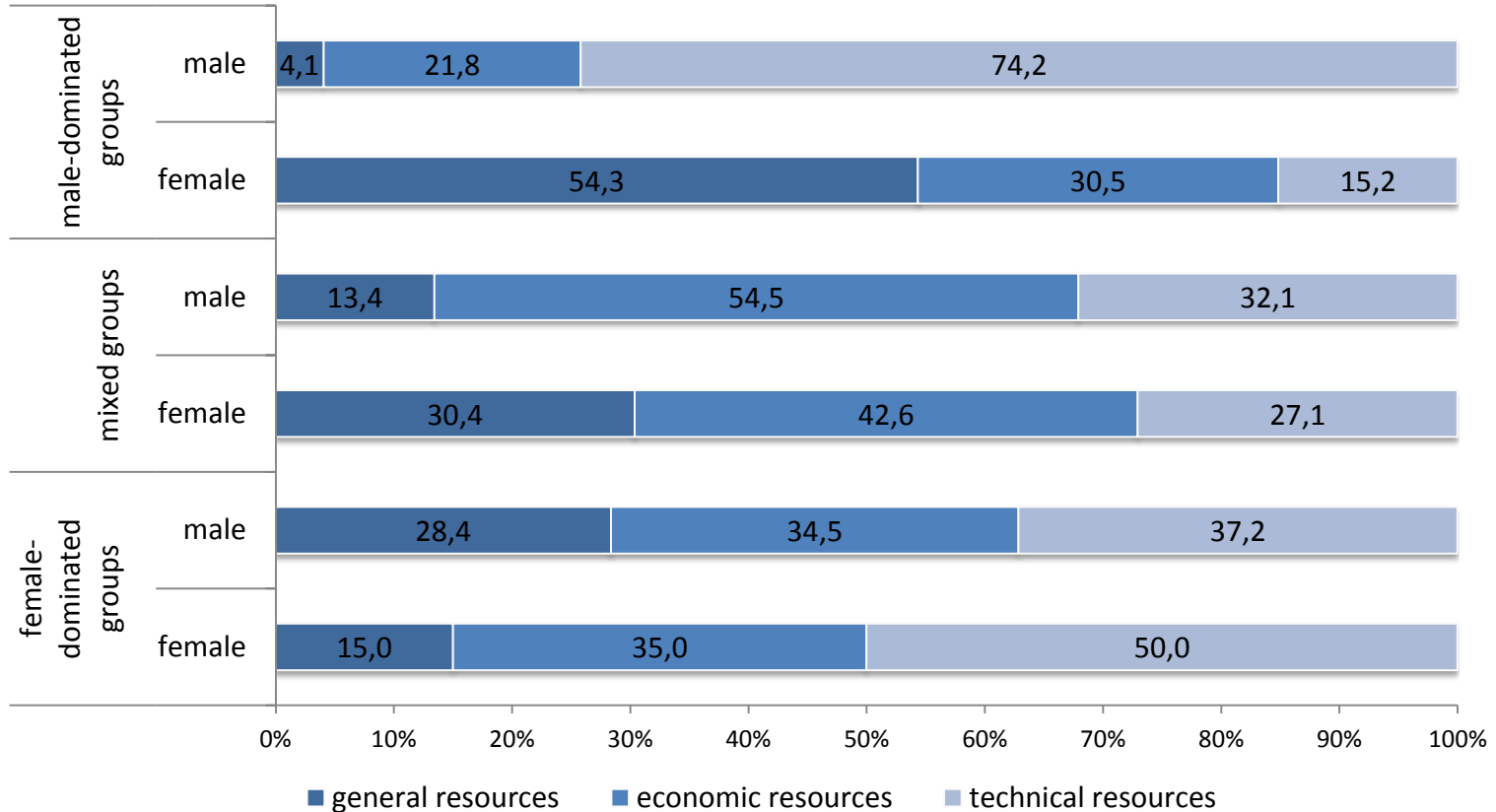
Distribution of men and women on segregated workplaces at career entry:

	Frequency of men in the workplace			
	0-30 %	31-59 %	60-100 %	Total
male	148	268	961	1183
female	280	303	600	1377
Total	428	571	1561	2560

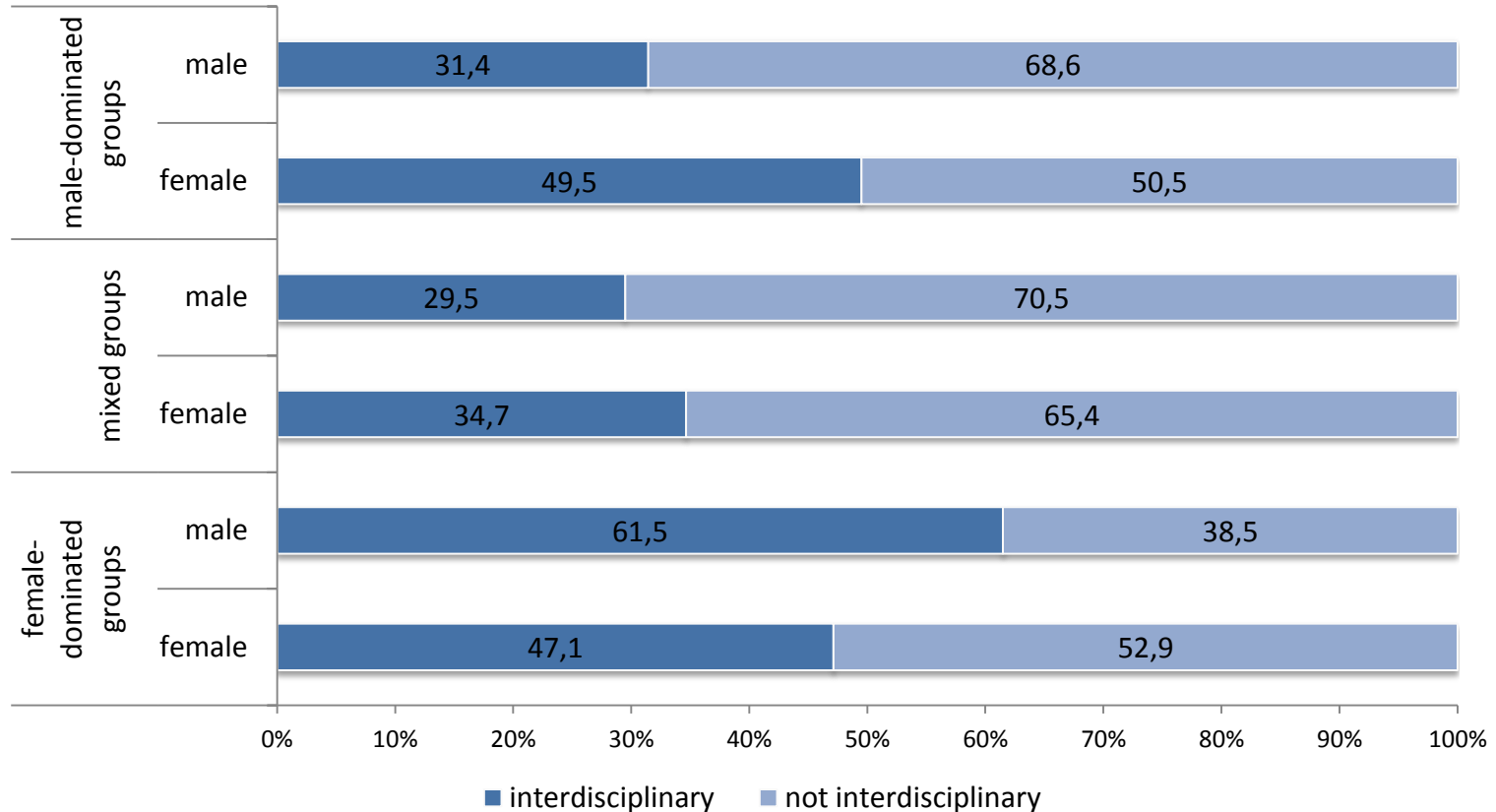
Operationalization

- log. gross hourly wages
- Gender: male/female
- Workplace Segregation: percentage share of men within the workplace
0-30 % = female dominated; 31-59 % = mixed; 60-100 % = male dominated
- Educational Resources: general resources, economic resources, technical resources (van de Werfhorst, 2002)
- Interdisciplinary workplaces via being in a minority of field of study at the workplace:
0-20 % = interdisciplinary; 20-100 % = not interdisciplinary

Descriptives – segregated workplaces and educational resources



Descriptives – segregated workplaces and interdisciplinary workplaces



Random-Effects Panelregression

Method & Control Variables

- Method:
 - RE-Panelregression with panel-robust standard errors
- Dependent Variable: Logged gross hourly wages
- Independent Variable: Female, educational resources (1=general, 2=economic==Ref., 3=technical), interdisciplinary workplaces & interaction of educ. resources and female
- Control Variables:

Industrial sector (1=public sector, 2=manufacturing sector, 3=service, 4=others), permanent contract, managerial position, firm size, multinational company, job change, type of university, grade (z-centered over field of study), duration of study (z-centered over field of study), working at university as a student, working in economy during studies, apprenticeships, internships, experiences abroad, socioeconomic background, age

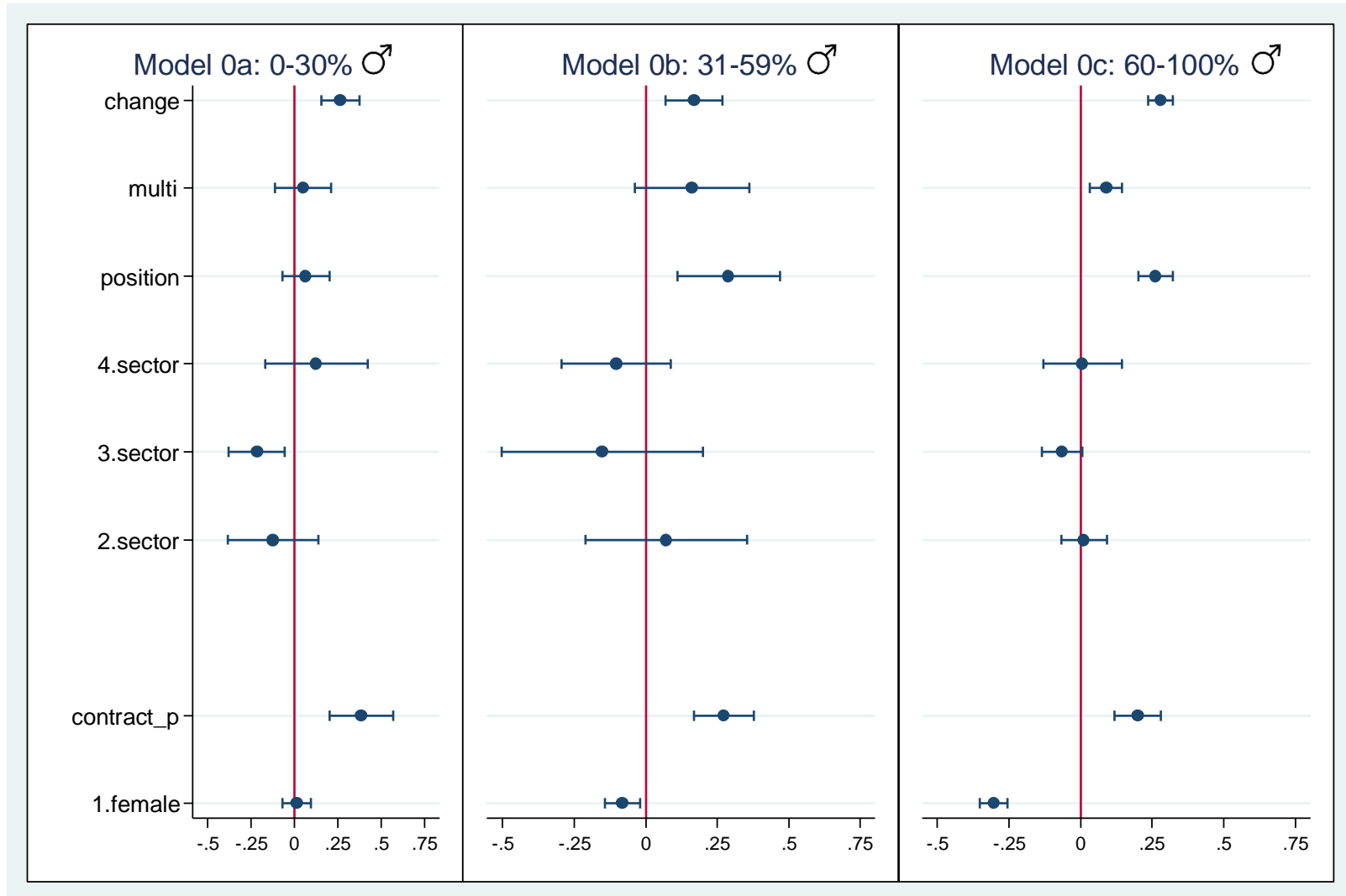
Oaxaca-Blinder Decomposition

Method & Control Variables

- Method:
 - Oaxaca-Blinder Decomposition
- Dependent Variable: Logged gross hourly wages
- Independent Variable: Female, educational resources (1=general, 2=economic, 3=technical), interdisciplinary workplaces
- Control Variables:
 - Job characteristics: Industrial sector (1=public sector, 2=manufacturing sector, 3=service, 4=others), permanent contract, managerial position, firm size, multinational company
 - Study: type of university, grade (z-centered over field of study), duration of study (z-centered over field of study), working at university as a student, working in economy during studies, apprenticeships, internships, experiences abroad
 - Demography: socioeconomic background, age

Results – Random-Effects Panelregression

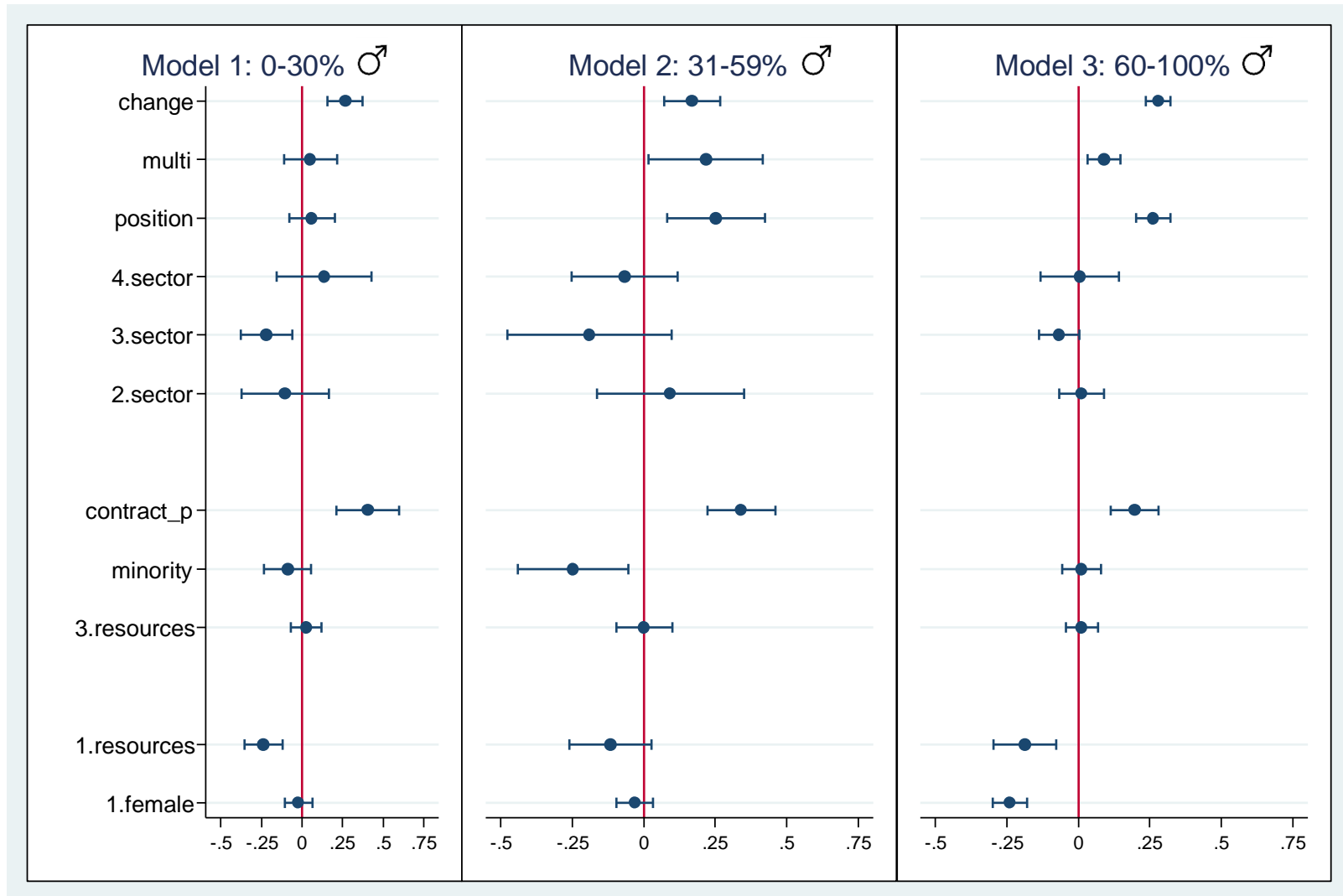
Selected Regression Coefficients & 95% CI



Notes: Linear Effect on logged gross hourly wages; Data: BAP0506; complete table in Appendix

Results – Random-Effects Panelregression

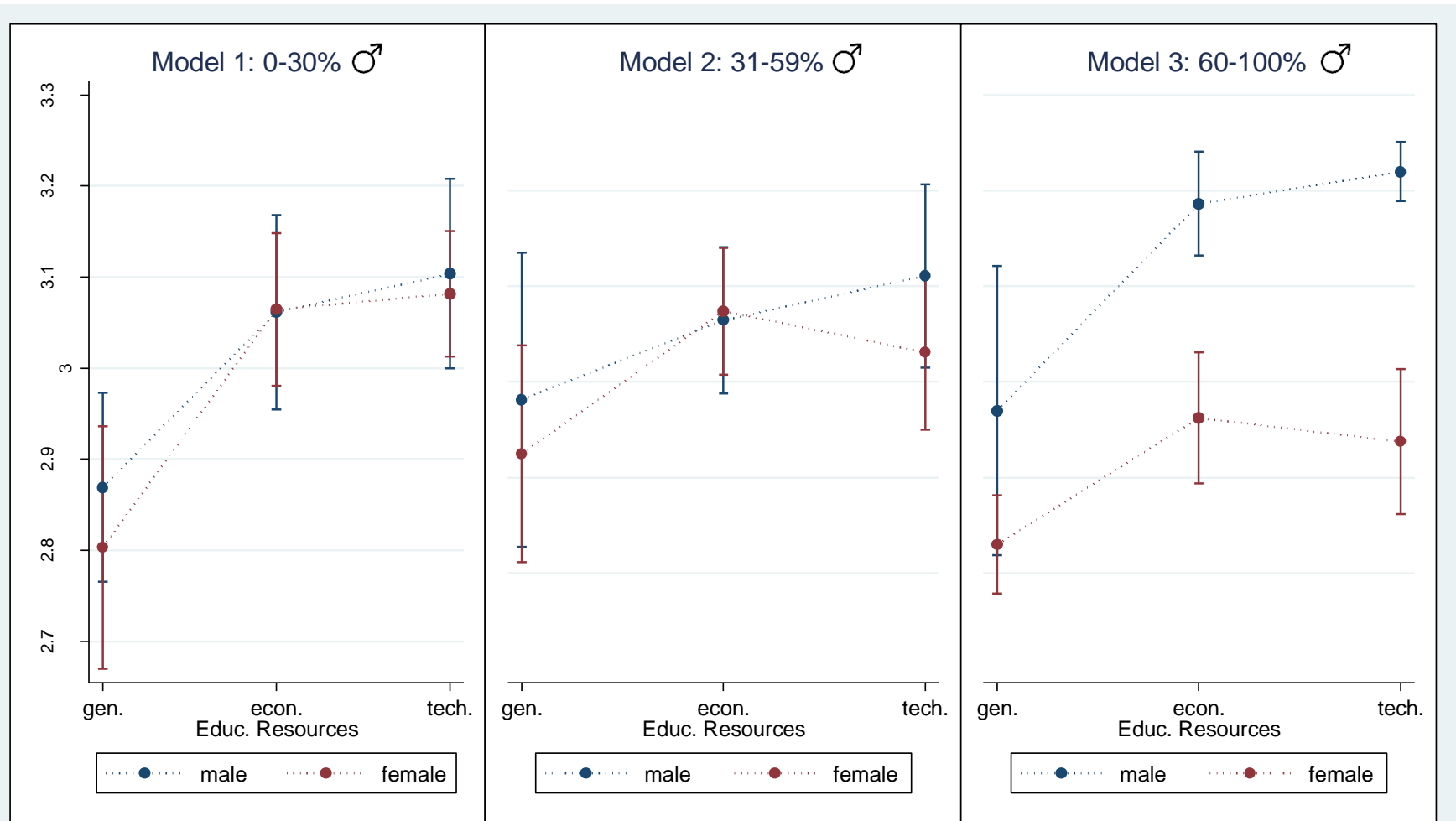
Selected Regression Coefficients & 95% CI



Notes: Linear Effect on logged gross hourly wages; Data: BAP0506; complete table in Appendix

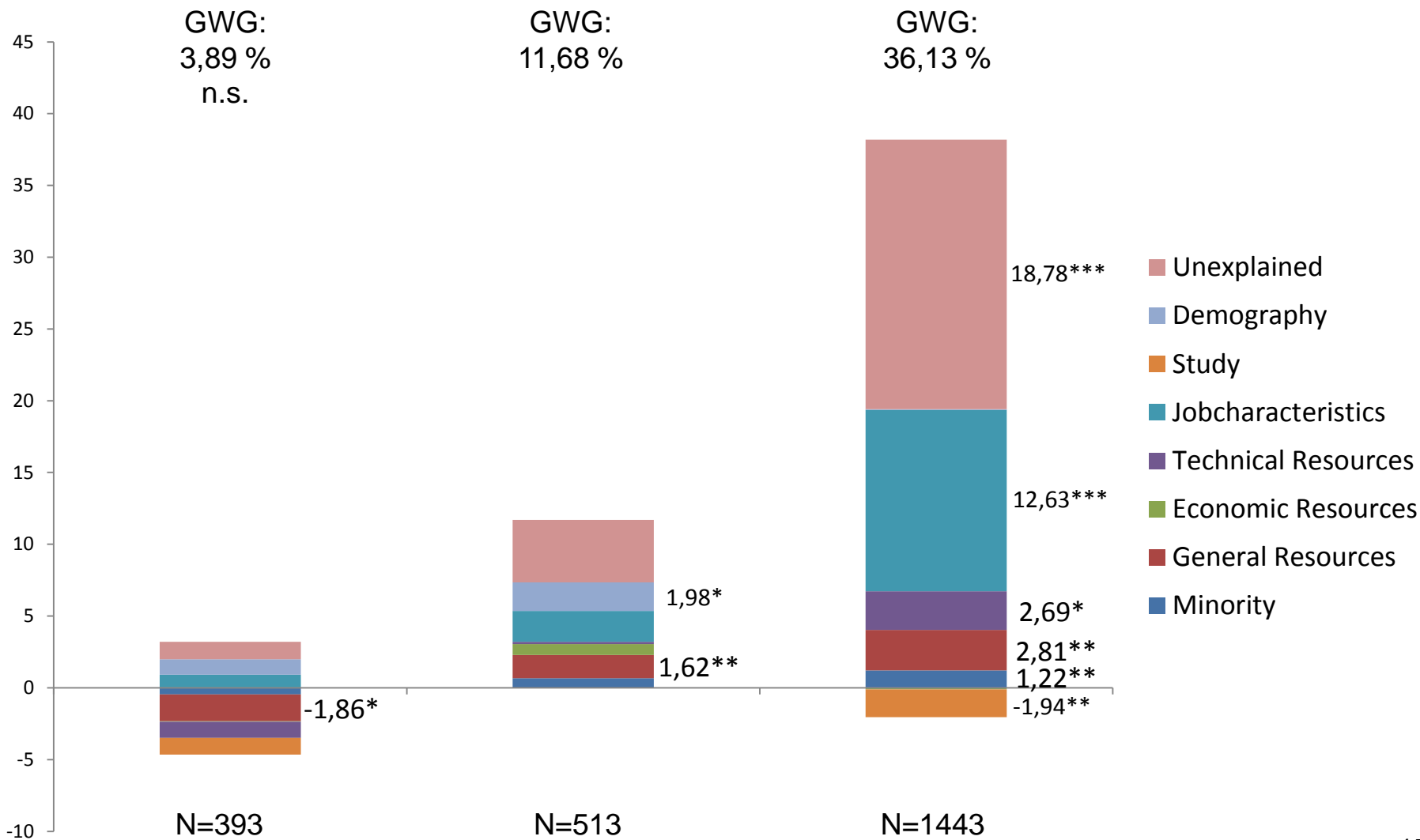
Results – Random-Effects Panelregression

Profile Plot with Educ. Resources-Female-Interaction & 95% CI



Notes: Data: BAP0506

Results – Oaxaca-Blinder Decomposition: Log. gross hourly wages at career start



Conclusion

- The bigger the percentage share of men at the workplace, the bigger is the gender wage gap.
- BUT: Educational resources affect the GWG
- The human capital endowment within the segregated workplaces explains part of the gender wage gap:
 - **General resources** contribute to the GWG within in segregated workplaces: That women more often have general resources in mixed and male-dominated workplaces increases the GWG and that men more often have them decreases the GWG in female-dominated workplaces.
 - **Technical resources** contribute to the GWG within male-dominated workplaces.
 - **Interdisciplinary workplaces** contribute to the GWG within male-dominated workplaces.

Thank you very much!

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Appendix: Educational Resources

Table 3. *Four matching job types.*

Job type	Category	Description
Cultural	General	All elementary occupations (elementary level), and non-specialized jobs of the lower level, except for clerical work
	Teaching	All teachers in lower, intermediate, higher and academic level jobs
	Humanities/arts	Jobs in languages, history, theology and arts at intermediate, higher and academic level
	Behaviour/society	Jobs in welfare, social science and journalism at intermediate, higher and academic level
Economic	Economic/commercial	Jobs in commerce, sales, clerical work, business and automation at lower, intermediate, higher and academic level, plus clerical work in general field
Communicative	Juridical	Jobs in juridical sector at intermediate, higher and academic level
	(Para)medical	Jobs in nursing, paramedics and medics
	Personal/social care	Jobs where the treatment of other individuals is central, e.g. in physical and psychological sense, and hotel industry, at lower, intermediate and higher level
Technical	Agriculture	Jobs in agriculture at lower, intermediate, higher and academic level
	Technical	Mathematical and natural science jobs; technical jobs, e.g. civil engineering, electronics, graphics, building; transport, at lower, intermediate, higher and academic level

Source: van de Werfhorst 2002, 45

Appendix: Results – Oaxaca-Blinder Decomposition: Log. gross hourly wages at career start

	Total	female-dominated workplaces	mixed workplaces	male-dominated workplaces
wages men	3,089652***	2,91747***	3,016289***	3,135369***
wages women	2,849522***	2,95632***	2,899501***	2,774019***
Difference	0,2401299***	-0,03885	0,1167872**	0,3613499***
female-dominated	0,0013229			
mixed	-0,0005435			
male-dominated	0,0001558			
majority	0,0081496**	-0,0046199	0,0066855	0,0122122**
general resources	0,0282437***	-0,0186343*	0,0161592**	0,0281382**
economic resources	-0,0015721	-0,000351	0,0075352	-0,0011148
technical resources	0,0251105***	-0,0113712	0,0016185	0,0268917*
jobcharacteristics	0,0864019***	0,0091605	0,0215946	0,1263075***
study	-0,0122872**	-0,011618	-0,0001982	-0,0193635**
demography	0,0043763*	0,0107439	0,0197919*	0,0005023
Unexplained	0,1007721***	0,0121599	0,0436005	0,1877763***
N	2349	393	513	1443

Appendix: RE-Panelregression on log. gross hourly wages at career start

	Model 1	Model 2	Model 3
1.female	0.00754	0.0239	-0.215***
1.resources	-0.195**	-0.0709	-0.207**
3.resources	0.0433	0.0524	0.0235
1.female#1.resources	0.000196	-0.0731	0.0953
1.female#3.resources	-0.0151	-0.105	-0.00563
minority	-0.0690	-0.252**	0.0239
contract_p	0.447***	0.399***	0.311***
2.sector	-0.275	0.168	-0.0429
3.sector	-0.295**	-0.242	-0.155***
4.sector	0.119	-0.0426	-0.0858
position	0.140*	0.293***	0.346***
multi	0.143	0.212*	0.121***
uni	0.0677	0.173***	0.0980***
z-grade	0.0252	-0.00730	-0.0243*
z-semester	-0.0340	0.000404	-0.0108
Working at university as student	0.0487	0.0141	-0.00999
Working as a student	0.0171	0.0615	0.0159
Experience abroad	0.0827*	0.00126	0.0369
apprenticeship	0.0430	0.0378	-0.0239
internships	-0.0576	0.0828	0.103***
age	0.000136	0.00211***	0.000825*
Socio-economic status	0.0895*	0.0258	-0.0239
2. Working experience	0.0125*	0.0113***	0.0129***
3. Working experience	0.0230**	0.0188***	0.0322***
4. Working experience	0.0429***	0.0245***	0.0551***
5. Working experience	0.0593***	0.0348***	0.0749***
6. Working experience	0.0821***	0.0440***	0.100***
_cons	2.637***	1.822***	2.386***
N	22109	29696	86677
R ² within	0.3641	0.4049	0.3590
R ² between	0.2407	0.2383	0.2857

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$