

# Inside occupations: comparing the task descriptions of 160 occupations across 8 EU member states

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- **EurOccupations project**
  - FP6 project for developing an occupations database for comparative socio-economic research in European Union (2006 – 2009)
  - 8 countries: BEL, DEU, ESP, FRA, GBR, ITA, NLD, POL
- **Partners in EurOccupations**
  - Erasmus University Rotterdam (Coordinator Kea Tijdens)
  - AO Consult, consulting company (Esther and Judith de Ruijter)
  - University of Amsterdam/Amsterdam Institute for Labour Studies
  - WageIndicator Foundation
  - Institutes in BEL, DEU, ESP, FRA, GBR, ITA, POL
- **WageIndicator Foundation**
  - Runs national websites in 65 countries
  - Posted a teaser for the EurOccupations' jobholders web-survey



# Research objective & outline



- **Objective: Are occupations similar regarding work activities?**
  - Does an Italian plumber engage in the same activities as a plumber from France, Poland or the United Kingdom?
- **Outline**
  - Theories:
    - Aggregation levels
    - Multiple dimension
    - Lack of theories for the ‘division of work’
  - Methods
    - occupation database
    - task descriptions for 160 occupations
    - surveys of experts and jobholders
  - Results
    - occupations are predominantly not similar across and within countries
  - Conclusion and discussion

- **Academic relevance**

- occupation is a key variable in social sciences
  - job analyses, school-to-work transitions, gender segregation, skill mismatch, competency modeling, professionalization, ...
- cross-country comparisons based on implicit assumption that similar occupational titles refer to the same work activities
- an empirical basis for this assumption is lacking
- discussion about generic versus occupation-specific skills

- **Societal relevance**

- European wide approach: New Skills New Jobs initiative (EU 2008)
- European Skills, Competences and Occupations taxonomy (ESCO) a framework of occupations, skills, competences and qualifications (EU 2010)

# Jobs and occupations - aggregation level

Detail	Logic	Numbers
ISCO-08 1-digit	Skill level	10
ISCO-08 2-digit	Similarity of task and duties	42
ISCO-08 3-digit	Similarity of task and duties	131
ISCO-08 4-digit	Occupational unit (similarity)	433
Occupational title	Beyond workplace (vacancies)	1,500
Job title	Workplace (coding indexes)	10,000+
Work task	Clustered into jobs	100,000+

- **Job titles - workplace**
  - Job evaluation systems or job descriptions
  - Job titles come and go
- **ISCO (recent ILO update to ISCO-08)**
  - Skill levels not empirically tested (Impossible on a global scale!)



- **Dimensions**

- Jobs and occupations are multi-dimensional concepts with hundreds of attributes
- E.g. decision latitude, stress levels, skill requirements, compensation, responsibilities, accountability, computer use, .....

- **Sources for assigning dimensions**

- aggregated from survey data OR from other sources (predominantly within country sources)
- e.g. from job evaluation systems, but these are competing systems, & only part of labour force is subject to job evaluation
- national occupational information systems, related to PES (Public Employment Services) and/or to VET (some countries only)

- **Defining jobs and occupations**
  - At each aggregation level: Bundles of same work tasks
- **No theories about the bundling**
  - Case study approaches
  - Empirical testing is difficult
  - Socio-technical theories: design approach
- **Division of work assumptions**
  - Tasks of same skill levels are grouped into jobs, not those of different skill levels
  - Tighter division of work in large organisations compared to small ones
  - In countries with tight connection between educational institutions and the labour market -> a stricter vertical division of labour
  - In countries with an emphasis on career progression  
-> less vertical and more horizontal division of labour

- **Objective: Are occupations similar?**
  - Does an Italian plumber engage in the same activities as a plumber from France, Poland or the United Kingdom?
  - OR: To what extent do raters rating the tasks of an occupation, reach the same conclusion?
- **Hypotheses**
  1. Occupations are similar, disregarding countries, thus the interrater agreement within occupations is high.
  2. Occupations are similar within each country, thus the interrater agreement within occupations is high within each country.
  3. Countries are similar regarding cross-occupation interrater agreements.
  4. Occupations are rated similarly by experts and jobholders, thus the interrater agreement does not differ across experts and jobholders.



- ***WageIndicator websites***

- Start 2001 in NLD, since 2004 abroad, now in 65 countries
- Websites present information of wages earned in a range of occupations, attracting large number of web-visitors

- ***WageIndicator web-survey***

- Web-survey on work and wages, posted on *WageIndicator* websites  
> continuous, volunteer, multi-country, multilingual web-survey
- Survey question ‘What is your occupation’, response through self-identification, using a search tree with an occupation database
- No open ended question > coding is too costly, aggregation bias, aggregation heterogeneity, not-identifiable answers

- **2006 *WageIndicator* database**
  - For 10 countries occupation database > 6,000 entries, many for one country only, no English translations, ISCO-88 codes
- **2006-09: Eurooccupations**
  - EurOccupations project: harmonisation, translation, extension & coding into ISCO-08 > 1,440 titles (ISCO-08)
- **2012: WISCO database**
  - Multilingual database for web-surveys in 65 countries >1,700 occupational titles, code in ISCO-08 (5 digit)
  - Development of Text String Matching for occupation survey question, including a tick box 'Add new occupation'

- **Measuring tasks: 160 occupations**
    - 160 occupations selected from the multilingual EurOccupations database with 1,440 titles
    - Aiming for sufficient variation in skill level, ISCO major groups, gender composition
    - & sufficient number of jobholders & coverage of entire labour market
  - **Task descriptions: 160 occupations \* 10 tasks**
    - Standardised procedure for drafting task descriptions, including definitions of aggregation level and use of language
    - Based on desk and Internet research using information from at least six different sources
    - Task descriptions in English, checked for Anglo-Saxon bias (use of non-English sources)
    - EurOccupations team members commented on task descriptions
- 25-Jan-12 Final task descriptions translated into languages of 8 countries

- **EurOccupations Web-survey**
  - Aim: respondents rate frequency + importance of each task in occupation
  - Multilingual web-survey for 8 EurOccupations countries
  - With routing: list of tasks depends on the ticked occupation (hardly possible in other mode than web-survey)
- **Raters: experts and job-holders**
  - Recruiting experts through networks EurOccupations teams, aiming at 5 experts per country per occupation  
one expert could rate more than one occupation
  - Insufficient experts for some occupations
  - Recruiting jobholders through national *WageIndicator* websites, using a teaser and a prize incentive

# Web-survey question



4. Could you indicate for each of the tasks how frequently the task is performed (never or on a daily, weekly, monthly or yearly basis)?

	Never	Yearly	Monthly	Weekly	Daily	I don't know
1. [Insert task 1]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. [Insert task 2]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. [Insert task 3]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. [Insert task 4]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. [Insert task 5]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. [Insert task 6]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. [Insert task 7]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. [Insert task 8]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. [Insert task 9]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. [Insert task 10]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Example: Tasks 'Car mechanic' (masterlist)

1. Examine vehicles to determine extent of damage or malfunctions and/or to estimate repair costs.
2. Confer with customers to obtain descriptions of vehicle problems, and to discuss work to be performed and possible future repair requirements.

3. Etc

# Methods: response



	BEL	FRA	DEU	ITA	NLD	POL	ESP	UK	Total
Expert q.	204	345	456	26	690	614	404	211	<b>2950</b>
# of experts	127	158	451	22	553	584	373	200	<b>2468</b>
Jobholder q.	183	26	113	139	348	136	202	100	<b>1247</b>
<b>Total</b>	<b>387</b>	<b>371</b>	<b>569</b>	<b>165</b>	<b>1038</b>	<b>750</b>	<b>606</b>	<b>311</b>	<b>4197</b>

- **Scale**

- Task frequency rated on a 5 point scale (0=never – daily)
- Task importance rated on 3 point scale (0=not imp. – 2 =very imp.)

- **Testing of similarity: rWG**

- rWG: cross-rater variance relative to variance from random ratings: "the extent to which the different judges tend to assign exactly the same rating to each object" (Tinsley and Weiss, 2000)
- 1. compute per occupation the variance across raters for each task for frequency and importance
- 2. compute per occupation  $rWG = 1 - (\text{obs\_var} / 2)$  for frequency each task (2 = variance expected from random freq rating, 1 = imp.)
- 3. compute mean rWG across tasks for each occupation

# Results: Hyp 1 Occupations are similar



- **Similarity of tasks for 151 occupations**

(9 insuff. obs.: at least 2 obs. for at least 6 countries)

- half lack of agreement or even no agreement at all (51%)
- one third shows a weak or moderate agreement (38%)
- one in ten shows strong agreement (12%)

		Frequency of tasks			Importance of tasks		
	rWG	#occ	%	raters p/o	#occ	%	raters p/o
No agreement	< .00	<b>39</b>	26	32	<b>9</b>	6	31
Lack of agreement	.00-.30	<b>38</b>	25	26	<b>13</b>	9	28
Weak agreement	.30-.50	<b>24</b>	16	27	<b>21</b>	14	34
Moderate agreement	.50-.70	<b>33</b>	22	23	<b>35</b>	23	26
Strong agreement	.70-.90	<b>16</b>	11	27	<b>71</b>	47	24
Very strong agreement	.90-1.0	<b>1</b>	1	14	<b>2</b>	1	5
Missing (<12 raters)		<b>9</b>		7	<b>9</b>		24
Total		<b>160</b>	100%	26	<b>160</b>	100%	26



# Results: Hyp 2 Occ's are similar within countries

- **Moderate+ agreement ( $rWG > .5$ ) in 4 countries**
  - Spain 80%                      - Germany 58%
  - Netherlands 43%              - Poland 48%.
- > similarity of frequency ratings is greater within than across countries

	ESP		DEU		NLD		POL	
rWG	Freq.	%	Freq.	%	Freq.	%	Freq.	%
< 0	<b>7</b>	5	<b>27</b>	22	<b>36</b>	27	<b>33</b>	25
.00-.30	<b>8</b>	5	<b>13</b>	11	<b>17</b>	13	<b>15</b>	11
.30-.50	<b>11</b>	7	<b>12</b>	10	<b>22</b>	17	<b>20</b>	15
.50-.70	<b>27</b>	18	<b>16</b>	13	<b>23</b>	18	<b>21</b>	16
.70-.90	<b>44</b>	30	<b>20</b>	16	<b>22</b>	17	<b>26</b>	20
.90-1.00	<b>51</b>	34	<b>34</b>	28	<b>11</b>	8	<b>18</b>	14
missing	<b>12</b>		<b>38</b>		<b>29</b>		<b>27</b>	
Total	<b>160</b>	100%	<b>160</b>	100%	<b>160</b>	100%	<b>160</b>	100%

# Results: Hyp 3 Countries are similar with regard to interrater agreements



- **Country agreement (mean rWG ) across occupations**

- for frequency of task
  - Spain strong agreement, Germany weak agreement
  - lack of agreement for Poland and Netherlands
- for importance of task

	N	Min	Max	Mean rWG	sd.
mean rWG_frequency of task					
Netherlands	131	-1.86	1	0.24	0.64
Poland	133	-2.02	1	0.28	0.67
Germany	122	-1.68	1	0.40	0.62
Spain	148	-1.21	1	0.70	0.36
mean rWG_importance of task					
Netherlands	115	-0.75	1	0.66	0.40
Poland	103	-0.42	1	0.74	0.27
Germany	97	-1.00	1	0.72	0.40
Spain	138	-0.64	1	0.80	0.23

# Results: Hyp 4 Experts and jobholders rate similar

- **Experts**

- 1/3 of occupations reveal at least moderate agreement (35%) ( $rWG > .5$ )

- **Jobholders**

- almost half of occupations reveal at least moderate agreement (43%)

	Experts and jobholders		Experts		Jobholders	
rWG	Freq.	%	Freq.	%	Freq.	%
< 0	<b>39</b>	26	<b>39</b>	27	<b>5</b>	13
.00-.30	<b>38</b>	25	<b>34</b>	23	<b>9</b>	23
.30-.50	<b>24</b>	16	<b>27</b>	18	<b>9</b>	23
.50-.70	<b>33</b>	22	<b>29</b>	20	<b>10</b>	25
.70-.90	<b>16</b>	12	<b>15</b>	10	<b>7</b>	18
.90-1.00	<b>1</b>	1	<b>2</b>	2	<b>0</b>	0
< 10 raters	<b>9</b>		<b>14</b>		<b>120</b>	
Total	<b>160</b>	100%	<b>160</b>	100%	<b>160</b>	100%

- **Though our black-box assumption is that occupations are similar across countries, to a large extent they are not**
- **Within country agreement slightly higher than across all countries**
- **Jobholders and experts rate alike**
- **Thus lots of problems to be solved**

- **Building a Europe-wide library of task descriptions to measure work activities in occupations seems a viable goal**
- **Empirical testing of task descriptions can be undertaken for a wide range of occupations across Europe, particularly when recruiting jobholders through Internet**
- **For an empirical testing of skill requirements or certificates per occupation the method was not viable > leading to large amounts of unstructured data, needs further development**
- **Further research may even allow for an empirical**



**Thank you  
for your attention**



## **Comments invited**

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