

A TEST OF THE USE IT OR LOSE IT HYPOTHESIS IN LABOR MARKETS AROUND THE WORLD

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- (1) The hypothesis
- (2) Aim of talk
- (3) Literature
- (4) Data
- (5) Graphical analysis
- (6) Statistical analysis
- (7) Conclusion

Source: A test of the 'use it or lose it' hypothesis in labour markets around the world,

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The use it or lose it hypothesis

- Engaging in cognitive demanding activities can prevent or impede age related decline in cognitive abilities
- Analogy: physical activities (e.g. training for running)
- A intuitive and plausible hypothesis
- Moreover: the hypothesis must be valid to some extent
- Conjecture, this paper: The deterioration of skills over age might be less pronounced in occupations with intensive use of cognitive skills relative to occupations with more limited use of these skills

- Salthouse (2006)
 - Survey – Use it or lose it hypothesis
- Rohwedder and Willis (2010)
 - Retirement
- Desjardins and Warnke (2013)
 - Overview of literature – ageing and skills

- PIAAC: Programme for the International Assessment of Adult Competences
- Adults aged 16-65
- 21 OECD countries
- Conducted 2012
- Skills:
 - Literacy
 - Numeracy
 - Problem solving

- Data includes measure of:
 - Skill level
 - Use of skill (at work and at home)
- Data selection:
 - Employed workers
 - Valid occupation
- ISCO: International Standard Classification of Occupations
- Two groups of workers, major occupation level (1-digit)
 - High skilled workers: ISCO main level 0-4
 - Low skilled workers: ISCO main level 5-9
- Examples, major level:
 - 1: Managers
 - 2: Professionals
 - 9: Elementary occupations

	Number of observations		Occupation group, Share	
			ISCO 0-4	ISCO 5-9
Austria		3,667	0.573	0.427
Belgium		3,311	0.597	0.403
Canada		19,168	0.593	0.407
Czech Rep.		3,622	0.520	0.480
Denmark		5,298	0.586	0.414
Estonia		5,331	0.514	0.486
Finland		3,869	0.534	0.467
France		4,471	0.538	0.462
Germany		4,015	0.539	0.461
Ireland		3,638	0.552	0.448
Italy		2,841	0.513	0.487
Japan		3,844	0.509	0.491
Korea		4,354	0.447	0.553
Netherlands		3,899	0.646	0.354
Norway		3,491	0.568	0.432
Poland		5,052	0.419	0.581
Slovak Rep.		3,285	0.487	0.513
Spain		3,312	0.477	0.523
Sweden		3,312	0.572	0.428
England		5,791	0.565	0.435
USA		3,525	0.571	0.429
Total		99,096	0.546	0.454

Figure 1. Literacy scores in main occupations and ages

ISCO 5-9 ○ ISCO 0-4 ●

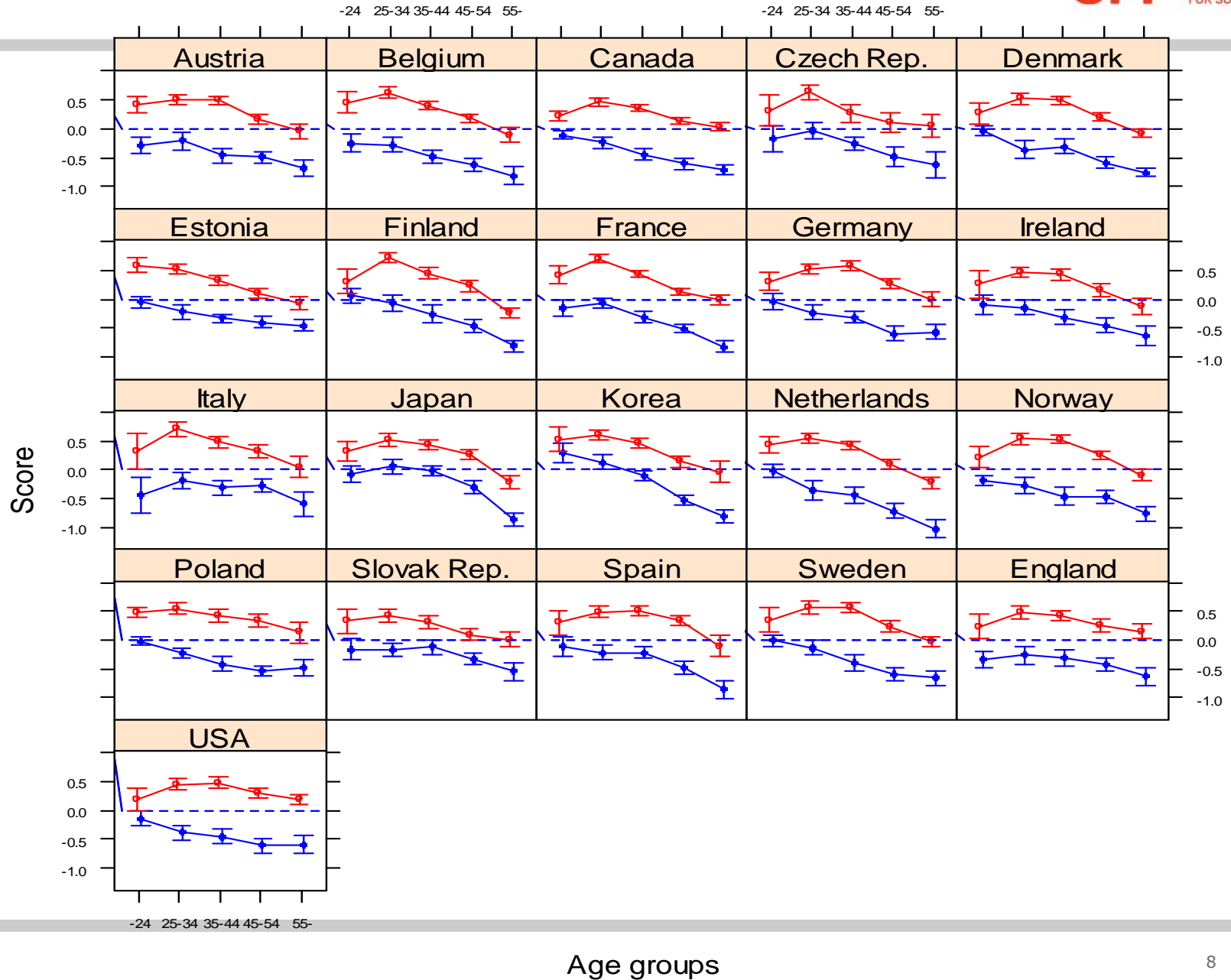
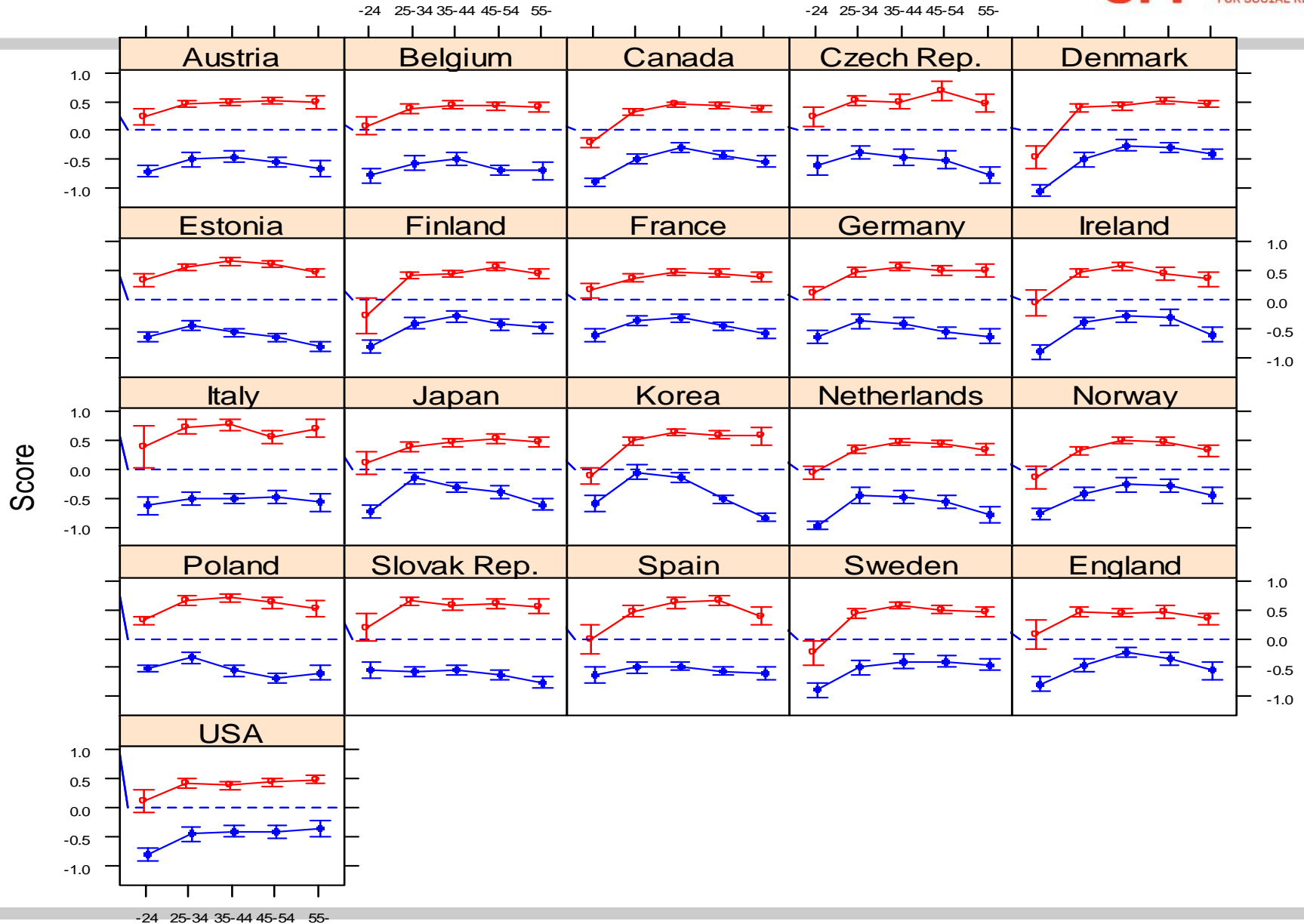


Figure 2. Use of reading at work in main occupations and ages

ISCO 5-9 ○ ISCO 0-4 ○



- Regressions on cross-section data
- Age 35 to 65 (graphs: decline after age 35)
- Dependent variables
 - Skill levels
 - Use of skills
- Explanatory variables
 - Dummy for High skilled workers
 - Age
 - Interaction Occupation-Age
 - Education
- Use it or loose it hypothesis: Positive interaction term

- Cohort effects?
- Younger cohorts have higher skill levels (Flynn effect)
- Because of higher levels of education?
- Include education in regressions

Years of education,
Age category

	16-24	25-34	35-44	45-54	55-65
Austria	10.5	12.5	12.4	12.0	11.4
Belgium	11.1	13.4	13.2	12.6	11.4
Canada	11.5	13.9	14.0	13.4	13.0
Czech Rep	11.3	13.8	13.4	13.1	12.8
Denmark	10.3	13.5	13.3	12.6	12.4
Estonia	11.0	12.6	12.3	12.4	11.9
Finland	10.5	13.3	13.4	12.7	11.4
France	11.0	12.5	12.0	10.9	9.7
Germany					
Ireland	13.9	15.8	15.1	14.1	12.7
Italy	9.9	12.6	11.1	10.1	8.7
Japan	11.5	13.7	13.5	13.4	12.4
Korea	11.4	14.5	13.9	12.3	10.1
Netherlan	11.7	14.1	13.7	13.3	12.7
Norway	12.0	14.7	14.8	14.2	13.9
Poland	11.2	14.0	13.1	12.4	11.3
Slovak Rep	11.6	13.8	13.5	13.1	12.5
Spain	10.8	12.4	12.0	11.2	9.7
Sweden	10.6	12.7	12.7	12.4	11.7
England	12.4	13.5	13.3	12.9	12.8
USA	11.3	13.8	13.8	13.5	13.6
Total	11.3	13.5	13.2	12.6	11.8

Literacy skills, regression results

	Occupation		Age/10		Interaction		Education	
	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.
Austria	0.793	0.089	-0.078	0.046	-0.187	0.056	0.104	0.008
Belgium	0.626	0.084	-0.057	0.052	-0.167	0.060	0.146	0.008
Canada	0.579	0.079	-0.064	0.034	-0.061	0.044	0.130	0.007
Czech Rep	0.243	0.119	-0.156	0.059	0.018	0.095	0.125	0.016
Denmark	0.527	0.075	-0.191	0.037	-0.059	0.042	0.122	0.008
Estonia	0.397	0.067	-0.076	0.028	-0.138	0.042	0.109	0.008
Finland	0.520	0.093	-0.204	0.049	-0.115	0.054	0.089	0.009
France	0.342	0.064	-0.156	0.029	-0.002	0.043	0.119	0.005
Germany								
Ireland	0.542	0.095	0.001	0.048	-0.168	0.058	0.114	0.009
Italy	0.498	0.095	-0.016	0.054	-0.172	0.066	0.080	0.008
Japan	0.149	0.079	-0.340	0.034	0.068	0.046	0.151	0.010
Korea	0.368	0.065	-0.142	0.032	-0.102	0.047	0.122	0.007
Netherlan	0.547	0.091	-0.239	0.051	-0.046	0.057	0.145	0.008
Norway	0.793	0.086	-0.123	0.044	-0.150	0.049	0.098	0.009
Poland	0.398	0.100	-0.020	0.044	-0.058	0.066	0.119	0.011
Slovak Rep	0.117	0.095	-0.204	0.047	0.018	0.059	0.105	0.011
Spain	0.314	0.080	-0.229	0.042	0.007	0.057	0.113	0.006
Sweden	0.733	0.100	-0.079	0.044	-0.167	0.056	0.128	0.011
England	0.461	0.109	-0.103	0.052	-0.003	0.066	0.103	0.011
USA	0.425	0.106	-0.094	0.050	-0.036	0.060	0.168	0.010
Average	0.468	0.089	-0.128	0.044	-0.076	0.056	0.119	0.009
Std.dev.	0.188		0.087		0.079		0.022	

Use of literacy at work, regression results						
	Occupation		Age/10		Interaction	
	Coeff.	Std.err.	Coeff.	Std.err.	Coeff.	Std.err.
Austria	0.893	0.076	-0.096	0.042	0.103	0.050
Belgium	0.982	0.078	-0.068	0.053	0.043	0.056
Canada	0.712	0.060	-0.116	0.035	0.082	0.041
Czech Rep	0.926	0.084	-0.104	0.044	0.137	0.049
Denmark	0.661	0.072	-0.064	0.029	0.089	0.036
Estonia	1.215	0.048	-0.128	0.024	0.026	0.032
Finland	0.750	0.065	-0.097	0.036	0.097	0.042
France	0.751	0.053	-0.126	0.033	0.108	0.038
Germany	0.939	0.087	-0.114	0.041	0.084	0.056
Ireland	0.754	0.071	-0.174	0.043	0.070	0.051
Italy	1.241	0.071	-0.024	0.034	-0.056	0.054
Japan	0.719	0.071	-0.136	0.032	0.140	0.045
Korea	0.619	0.055	-0.368	0.023	0.320	0.039
Netherlan	0.878	0.076	-0.169	0.040	0.104	0.050
Norway	0.727	0.084	-0.106	0.047	0.026	0.059
Poland	1.301	0.079	-0.033	0.042	-0.051	0.056
Slovak Rep	1.096	0.075	-0.121	0.031	0.081	0.049
Spain	1.135	0.063	-0.070	0.033	-0.014	0.048
Sweden	0.975	0.074	-0.013	0.039	-0.040	0.045
England	0.667	0.060	-0.137	0.041	0.084	0.049
USA	0.783	0.078	0.015	0.046	0.034	0.053
Average	0.892	0.071	-0.107	0.037	0.070	0.048
Std.dev.	0.206		0.078		0.082	

Regressions, results, literacy:

- Use of skills at work:
 - Pronounced decline in the use of literacy at work for low skilled workers
 - A smaller decline for high skilled workers
- Literacy skills:
 - substantial decline for both groups
 - decline for high skilled workers larger than decline for low skilled workers in most countries
- Many countries, high skilled workers compared to low skilled workers:
 - Lower decline in the use of literacy
 - Larger decline in literacy ability
- At variance with the use it or lose it hypothesis
- Conclusion: Rejection of the hypothesis (on the present data)
- Numeracy and problem solving: Same conclusion

Figure 3. Numeracy scores in main occupations and ages

ISCO 5-9 ○ ISCO 0-4 ○

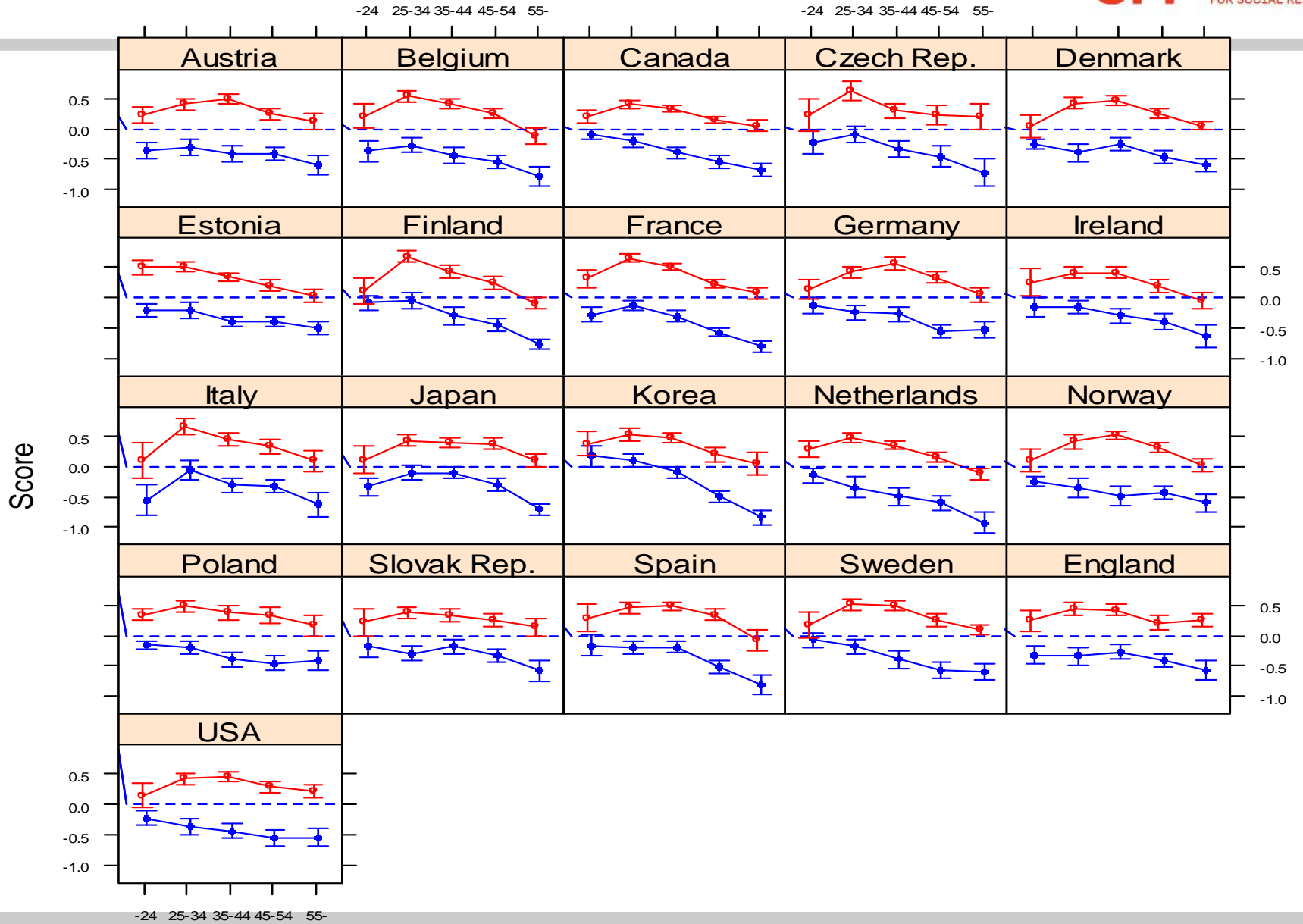


Figure 4. Use of numeracy at work in main occupations and ages

ISCO 5-9 ○ ISCO 0-4 ○

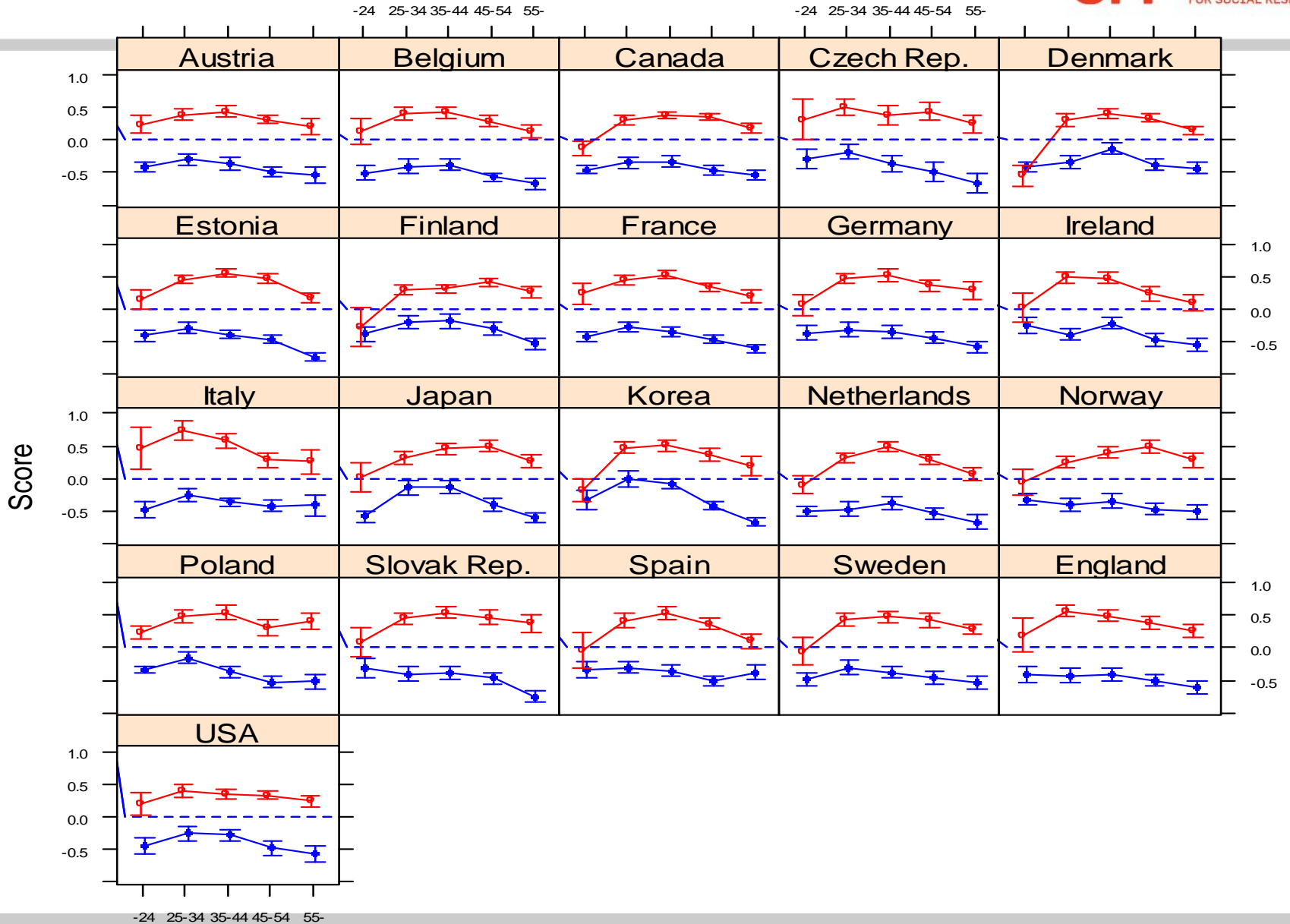


Figure 5. Problem solving scores in main occupations and ages

ISCO 5-9 ○ ISCO 0-4 ○

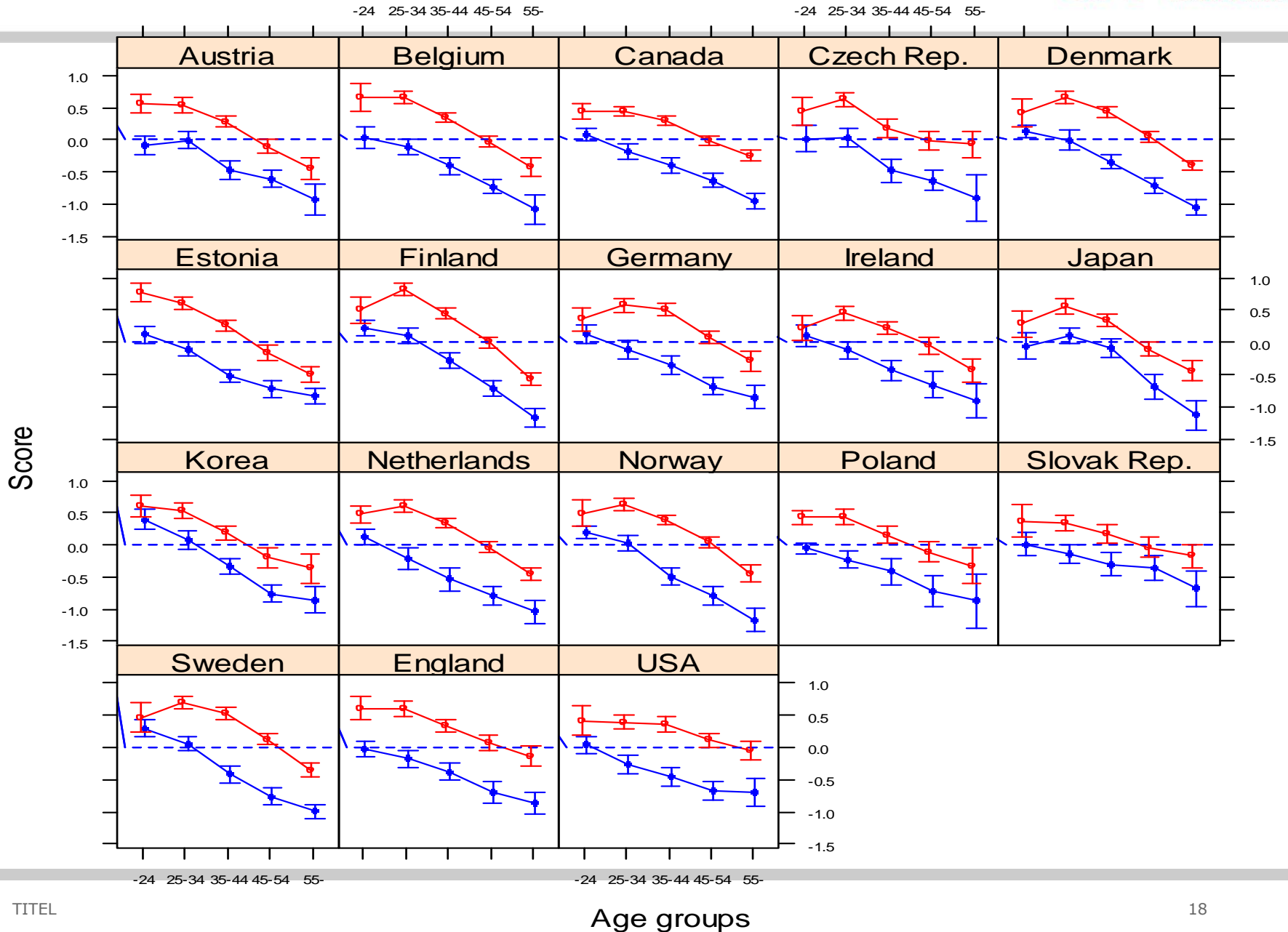
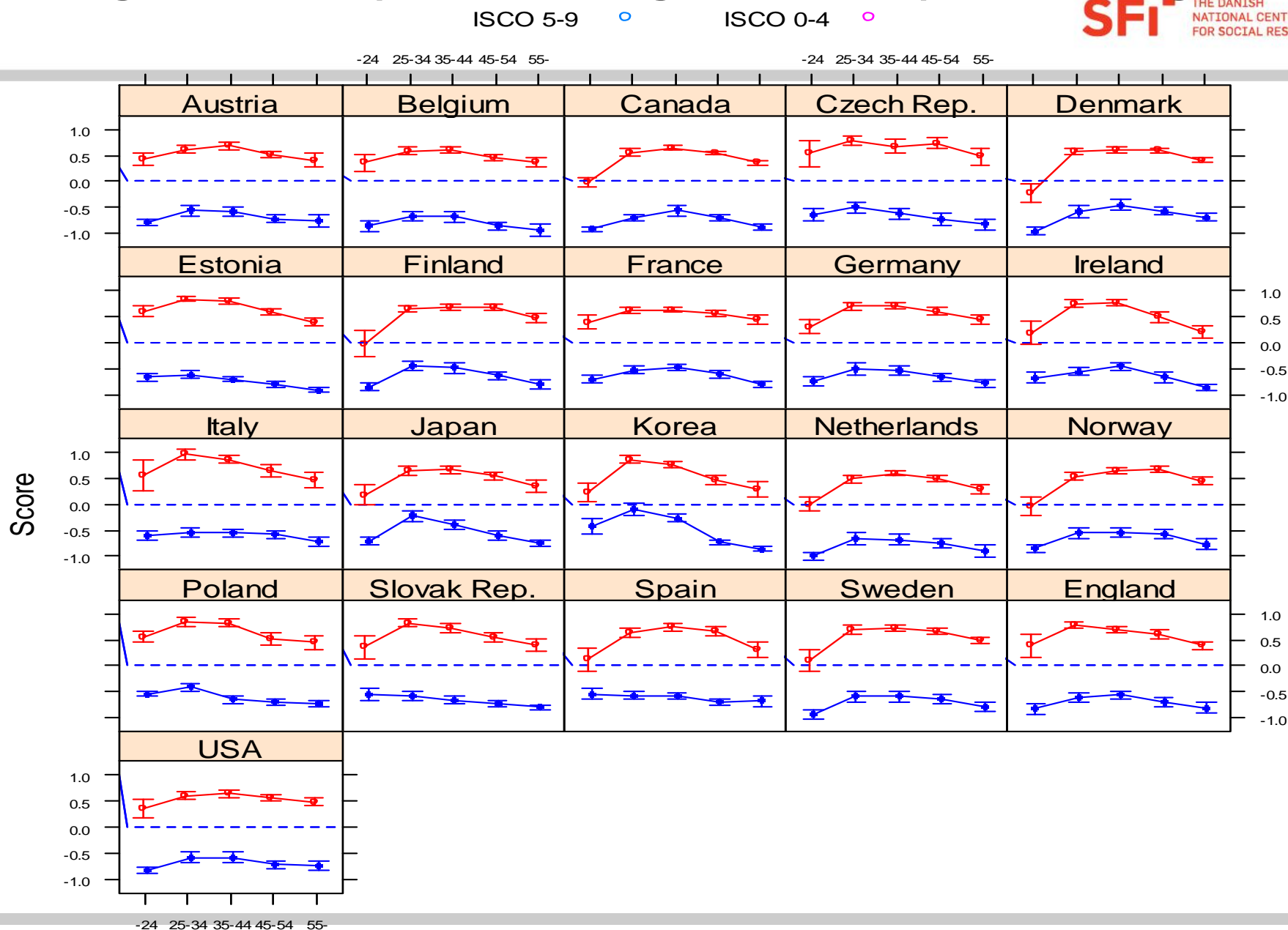


Figure 6. Use of problem solving in main occupations and ages



- Cohort effects – beyond education.
- Retirement
- Earnings profiles: Earnings continue to increase after decline in skills begin
- Types of cognitive abilities
 - Fluid intelligence (same pattern as in this paper)
 - Crystallized intelligence (increases with age)