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Similarities and differences of simultaneous influences on risk perceptions of CCS project proposals

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Outline of the Talk

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Point of Departure

- Public acceptance = one important precondition for the large-scale demonstration and application of CCS
- Acceptance of new technologies is influenced by risk and benefit perceptions
- Risk and benefit perceptions of technologies are influenced by various characteristics of individuals, characteristics of the technology or by cultural factors

What are the similarities and differences of simultaneous influences on personal risk perceptions in the Netherlands, the UK, Germany and Norway?

Method

- Data of representative surveys (n=1000 and more in each country)
- Assessment of risks and benefits of capture, transport and storage of CO₂ by survey respondents after they were provided with information
- Responses regarding the personal risks of the three process steps of CCS were combined into an index of personal risk perceptions (Cronbach's alpha: .83)

Method (II)

- Linear regression analyses
- Dependent variable: personal risk perceptions of CCS
- Independent variables:
 - gender
 - age
 - education
 - knowledge
 - pre-existing attitudes towards renewables, coal, and nuclear energy
 - trust in information sources

Results – The Netherlands

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	5,287	,386		13,700	,000**
Gender	,080	,078	,029	1,023	,306
Age	-,002	,002	-,020	-,689	,491
Education	-,125	,030	-,128	-4,199	,000**
General knowledge on environmental issues and science	-,110	,034	-,096	-3,253	,001*
Knowledge of the activities contributing to CO ₂ build-up	-,148	,034	-,129	-4,334	,000**
Knowledge of CCS	-,104	,025	-,124	-4,168	,000**
Pre-existing attitude towards renewables	-,118	,046	-,076	-2,553	,011*
Pre-existing attitude towards coal	,056	,027	,061	2,059	,040*
Pre-existing attitude towards nuclear	-,128	,022	-,178	-5,835	,000**
Trust in information from governments and political parties	,011	,044	,009	,252	,801
Trust in information from energy, gas and other companies	,081	,037	,075	2,195	,028*
Trust in information from NGOs	,041	,040	,035	1,032	,302

Dependent Variable: Personal risk perceptions of CCS, ** p < .001, * p < .05; R² = .174

Results – The UK

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4,409	,397		11,116	,000**
Gender	,291	,091	,105	3,189	,001*
Age	-,007	,003	-,074	-2,256	,024*
Education	-,016	,024	-,020	-,657	,511
General knowledge on environmental issues and science	-,020	,039	-,016	-,500	,617
Knowledge of the activities contributing to CO ₂ build-up	-,134	,038	-,116	-3,550	,000**
Knowledge of CCS	-,029	,025	-,036	-1,141	,254
Pre-existing attitude towards renewables	-,088	,048	-,062	-1,849	,065
Pre-existing attitude towards coal	,025	,028	,029	,869	,385
Pre-existing attitude towards nuclear	-,041	,024	-,057	-1,714	,087
Trust in information from governments and political parties	-,044	,040	-,044	-1,113	,266
Trust in information from energy, gas and other companies	-,010	,036	-,011	-,274	,784
Trust in information from NGOs	,062	,039	,056	1,573	,116

Dependent Variable: Personal risk perceptions of CCS, ** p < .001, * p < .05; R² = .063

Results – Germany

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2,865	,479		5,981	,000**
Gender	,237	,099	,078	2,397	,017*
Age	,002	,003	,018	,599	,549
Education	-,070	,035	-,064	-1,993	,047*
General knowledge on environmental issues and science	-,037	,039	-,032	-,954	,341
Knowledge of the activities contributing to CO ₂ build-up	-,088	,044	-,066	-1,985	,047*
Knowledge of CCS	,077	,030	,087	2,561	,011*
Pre-existing attitude towards renewables	,041	,053	,025	,765	,445
Pre-existing attitude towards coal	,138	,029	,158	4,773	,000**
Pre-existing attitude towards nuclear	-,070	,027	-,087	-2,602	,009*
Trust in information from governments and political parties	-,103	,046	-,086	-2,256	,024*
Trust in information from energy, gas and other companies	,014	,034	,015	,404	,686
Trust in information from NGOs	,167	,044	,135	3,794	,000**

Dependent Variable: Personal risk perceptions of CCS, ** p < .001, * p < .05; R² = .075

Results – Norway

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4,034	,385		10,487	,000**
Gender	,203	,083	,081	2,435	,015*
Age	-,001	,003	-,013	-,459	,646
Education	,021	,031	,020	,676	,499
General knowledge on environmental issues and science	-,048	,032	-,046	-1,502	,133
Knowledge of the activities contributing to CO ₂ build-up	-,135	,035	-,121	-3,828	,000**
Knowledge of CCS	-,113	,024	-,166	-4,803	,000**
Pre-existing attitude towards renewables	-,177	,040	-,131	-4,364	,000**
Pre-existing attitude towards coal	,148	,031	,152	4,711	,000**
Pre-existing attitude towards nuclear	-,071	,021	-,108	-3,368	,001*
Trust in information from governments and political parties	,073	,040	,065	1,825	,068
Trust in information from energy, gas and other companies	-,050	,031	-,052	-1,585	,113
Trust in information from NGOs	,023	,036	,022	,631	,528

Dependent Variable: Personal risk perceptions of CCS, ** p < .001, * p < .05; R² = .196

Preliminary Conclusions

- Personal risks of CCS are generally assessed lower by individuals who have more knowledge
- Women perceive the personal risks of CCS higher than men
- Other factors such as age, education, pre-existing attitudes towards energy sources or trust in information sources vary in their significance from country to country
- Personal risk perceptions of CCS are also influenced by factors which were not included in the regression model

Thank you very much for your attention!