

What Motivates Us to Seek Information About Energy Policies?: Swiss Citizens' Information Seeking Behavior on Deep Geothermal Energy

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Motivation & Importance

- This research is a part of a larger inquiry on how we can design policy measures to encourage people to update their knowledge with the hopes of enlivening policy discourse.
- Policy communication lacks an “intervention” model to inform and correct misinformation.
 - Political polarization on the rise, favoring ideology rather than facts.
 - Energy transitions necessary across the world, and how those take place is influenced by people (i.e., democratic institutions and behavior).
- Literature shows that information behavior is related to each type of knowledge (subjective, objective, experiential).
- Unlike other influences on info behavior (e.g., gender), knowledge is potentially *actionable*.

Research Questions

- What factors motivate people to *state* an informational need about technologies and policies?
 - Knowledge (subjective, objective, experiential)
 - Interest (e.g., Lupia (2013))
 - Values (e.g., de Groot et al.(2008))
 - Demographics (e.g., gender, education, income)
- Given a stated informational need, what factors that motivate people to actually *seek* information?
- Can we use subjective knowledge to prompt information seeking by making an informational need conscious?

Survey Flow & Data

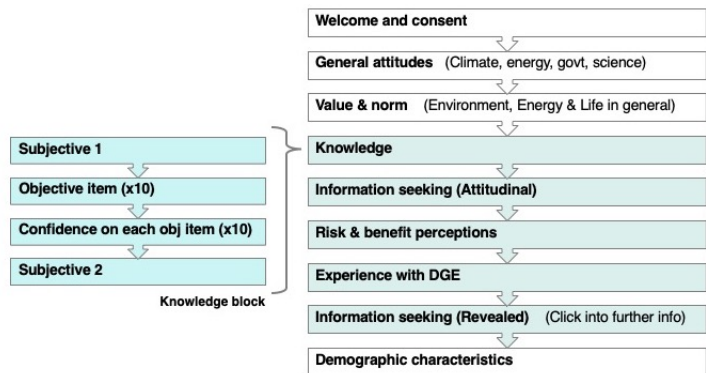
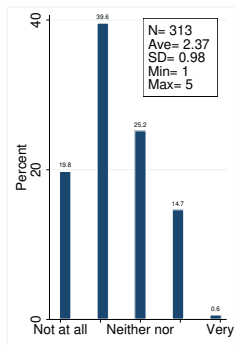


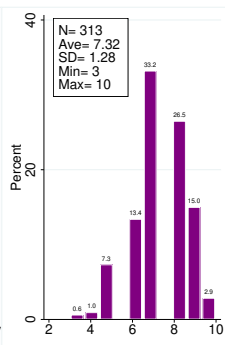
Figure: This population representative survey was fielded between May-June 2018. N=351 with 77% response rate. Interview used quota sampling (age, gender, WEMF region, educational level, political party, postal code).

Our Related Research Findings

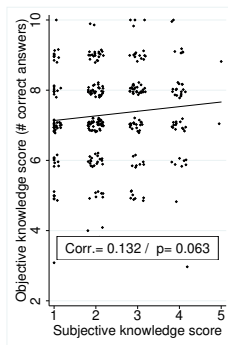
(a) Subjective



(b) Objective



(c) Correlation



- We have shown that subjective and objective knowledge on DGE are not highly correlated.
- We also find that objective and subjective knowledge are influenced by political heuristics

Subjective Knowledge Updating

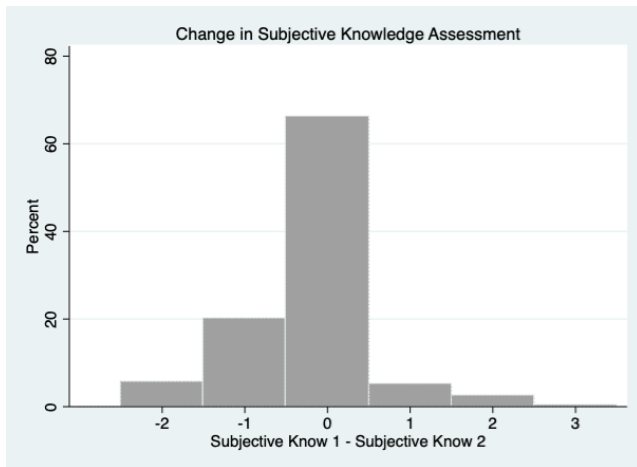


Figure: Histogram of the change in subjective knowledge assessment (within respondent). Change in subjective knowledge is calculated by subtracting the second assessment from the first.

Estimation Strategy

$$P(Y = 1|x_1...x_m) = \Lambda(\alpha + \beta objknow + \sigma subjknow + \lambda interest + \mathbf{trust}\phi + \mathbf{risk/benefit}\eta + \mathbf{X}^m\gamma + \varepsilon), \quad (1)$$

- $P(Y = 1|x_1...x_m)$ = conditional probability of information seeking
- *objknow* = objective knowledge score (0-10)
- *subjknow* = subjective knowledge measure (1-5)
- *interest* = interested in energy topics (1-4)
- **trust** = vector of 3 trust variables: government, science, vote
- **risk/benefit perception** = vector of risk and benefit perceptions
- \mathbf{X}^m = vector demographics (e.g., age, gender, etc.)
- ε = idiosyncratic error term

Results: Stated Informational Need

Table: Probability of stated informational need predicted by logit regressions

	Stated (1)		Stated (2)	
Objective Knowledge Score	0.024	(0.019)	0.023	(0.019)
Subjective Knowledge	-0.024	(0.026)	-0.022	(0.025)
NLT Subjective Knowledge			-0.038*	(0.022)
Interest in Energy Topics	0.131***	(0.036)	0.131***	(0.036)
Perception Variables:				
Risk Perception	-0.493**	(0.201)	-0.475**	(0.202)
Benefit Perception	0.190	(0.184)	0.230	(0.185)
Social Norm	0.069**	(0.027)	0.066**	(0.027)
Egoism Value	0.005	(0.026)	0.004	(0.025)
Political Leaning:				
Middle	-0.001	(0.064)	0.000	(0.064)
Right	-0.002	(0.061)	0.003	(0.061)
Demographics:				
Female	-0.105**	(0.049)	-0.101**	(0.049)
Age	-0.002	(0.002)	-0.002	(0.002)
Income	-0.033***	(0.013)	-0.033***	(0.013)
Education:				
Vocational	0.015	(0.136)	0.007	(0.136)
High school & equi.	0.060	(0.146)	0.047	(0.146)
University+	0.125	(0.143)	0.114	(0.143)
Observations	313		313	
Pseudo R2	0.1522		0.1600	

Note: Coefficients are average marginal effects. Some covariates suppressed to save space. *p<0.10, ** p<0.05, ***p<0.01

Results: Revealed Informational Need

Table: Probability of seeking information given stated informational need

	Revealed (1)		Revealed (2)	
Objective Knowledge Score	0.021	(0.029)	0.020	(0.029)
Subjective Knowledge	0.099***	(0.036)	0.099***	(0.036)
NLT Subjective Knowledge			-0.006	(0.033)
Interest in Energy Topics	-0.026	(0.053)	-0.026	(0.053)
Perception Variables:				
Risk Perception	-0.003	(0.286)	0.002	(0.288)
Benefit Perception	0.044	(0.253)	0.051	(0.255)
Social Norm	-0.002	(0.042)	-0.002	(0.042)
Egoism Value	-0.072**	(0.036)	-0.072**	(0.036)
Political Leaning:				
Middle	-0.111	(0.083)	-0.110	(0.083)
Right	0.012	(0.083)	0.013	(0.083)
Demographics:				
Female	-0.016	(0.069)	-0.016	(0.069)
Age	-0.004*	(0.002)	-0.004*	(0.002)
Income	-0.012	(0.020)	-0.012	(0.020)
Education:				
Vocational	0.293	(0.211)	0.294	(0.211)
High school & equi.	0.374*	(0.222)	0.376*	(0.222)
University+	0.410*	(0.217)	0.410*	(0.217)
Observations	225		225	
Pseudo R2	0.1054		0.0886	

Note: Coefficients are average marginal effects. Some covariates suppressed to save space. *p<0.10, ** p<0.05, ***p<0.01

Results, Taken Together

- Knowledge variables surprisingly not correlated with stated information need
- Greater *subjective* knowledge statistically significantly correlated with seeking more information, given a stated need
 - Cognitive Hurdle Hypothesis (also supported by correlation between higher education and seeking).
- Few predictors of information behavior *mutable*
- Suggests a two-pronged approach:
 - 1 social norms, risk perceptions, and interest (maybe) are mutable—can be used to make an information need conscious
 - 2 encourage people by making information accessible or by boosting confidence
- People do reassess their knowledge when prompted
- Tension between feedback as prompt (if they do badly on obj questions) and discouraging people (cognitive barrier)

Future Work

- We will run a survey experiment in the future.
 - Make objective questions more difficult to give prompt a chance?
 - Use quiz feedback as a prompt?
 - How can we make *interest* mutable?
 - Consider psychological interventions that could be scaled for policy communication.
- Want to test “interventions” that encourage information seeking.
- Need to consider:
 - Quality of information seeking (e.g., avoid confirmation bias).
 - Information processing and acquisition.

Thank you for your attention!
Questions?

Backup Slides

Objective Knowledge Questions

Table: Summary of objective knowledge by item: from the most to the least correctly answered item (N = 313) with simplified item descriptions

Objective knowledge items	Share correct (0–1)	S.D.
How to extract geothermal energy in general. (8)	.97	.18
From what geothermal energy originates. (7)	.96	.19
If Switzerland has already used (shallow) geothermal for heat pumps. (1)	.92	.27
Which natural disasters can be linked to DGE in general. (10)	.87	.34
If there were (cancelled) DGE projects in Switzerland in the past. (6)	.84	.37
In what DGE can be converted to. (9)	.73	.45
Whether Switzerland is already generating energy by DGE. (4)	.65	.48
If full exploitation of DGE capacity could replace nuclear power plants. (2)	.57	.50
Whether resulting water from DGE can contain toxins. (3)	.50	.50
Whether DGE is considered a renewable source. (5)	.31	.46

Numbers in parentheses are the order of appearance. Note: “Share correct” is the share of correct responses ranging 0 – 1.

Summary Stats: Quota Variables

Table: Quota Sampling Variables

	1	2	3	4	Total
Age	47.51 (15.80)	51.19 (18.10)	47.80 (16.22)	50.83 (15.79)	48.44 (16.34)
Female	0.456 (0.500)	0.509 (0.504)	0.562 (0.499)	0.500 (0.514)	0.495 (0.501)
Education Level	2.614 (0.915)	2.614 (0.840)	2.825 (1.003)	2.278 (0.461)	2.649 (0.912)
Income	3.703 (2.058)	3.947 (1.846)	3.175 (1.712)	2.556 (1.294)	3.546 (1.926)
Observations	313				

Mean coefficients; standard deviation in parentheses
Statistics based on data from main sample

Summary Stats: Independent Variables

Table: Summary Statistics of Main Variables

	Mean	Std. Dev	Min	Max
Objective Knowledge Score	7.316	1.283	3.000	10.000
Subjective Knowledge	2.367	0.982	1.000	5.000
Interest in Energy Topics	3.272	0.716	1.000	4.000
Interest in Climate Topics	3.645	0.624	1.000	4.000
Experience with DGE Incidents	0.137	0.345	0.000	1.000
Risk Perception	0.670	0.124	0.300	1.000
Benefit Perception	0.730	0.139	0.300	1.000
Trust in Government	5.71e-09	1.000	-2.568	1.621
Trust in Science	-4.03e-09	1.000	-3.234	1.766
Observations	313			

Summary Stats: Control Variables

Table: Summary Statistics of Control Variables

	Mean	Std. Dev	Min	Max
Female	0.495	0.501	0.000	1.000
Age	48.44	16.339	18.000	90.000
3-level Political Scale	2.045	0.854	1.000	3.000
Income	3.546	1.926	1.000	9.000
Education Level	2.649	0.912	1.000	4.000
WEMF Region	3.086	0.833	2.000	4.000
Observations	313			