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Science to the People: Search for Determinants of Public Engagement with Science

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Comparative Social Research

- Skeptical and suspicious attitude towards science in modern post-industrial societies [Allum et al. 2008; Beck 1992]
- Global technological and environmental risks as an outcome of man-made and man-governed activities
- Growing public demand to reconsider ‘automatic deference’ [Fuller 2011] to the authority of science and reshape previously prevailing deficit model of science communication [Bucchi and Trench 2008]

- Emergence of ‘scientific citizenship’ idea [Blue and Medlock 2014] resulting in increasing rates of public engagement with science

- Public engagement as a ‘practice of involving members of the public in the agenda-setting, decision-making and policy-forming activities of organizations/institutions responsible for policy development’ [Rowe and Frewer 2005, p. 253]

- Dutch National Research Agenda
- Dutch people directly shape the scientific agenda of research institutions by providing questions that worry them

- Swiss anti-nuclear protests
- Force Swiss government to reconsider nuclear policy of the state

- SETI@home (Search for Extraterrestial Intelligence) project of UC Berkeley

- Utilizes citizens' personal computers to detect intelligent life outside earth

What kind of societies are more encouraging in developing and maintaining public engagement with science?

Possible explanation: the proliferation of emancipative values is that key mechanism proclaiming the supremacy of human choice and skeptical attitude towards traditional conformity values [Welzel et al. 2003]

Who are those people who are more likely to participate and support democratic control over science?

Reflexive Modernization Theory [Beck 1992]: democratic control over science is demanded by thoughtful yet skeptical citizens who are critical enough to see malfunctions of scientific institution and regard its democratization as a way to make science more effective and useful to society

Institutional Alienation Perspective [Gauchat 2012]: democratic control over science as an attempt of people to overcome legitimacy crisis and reduce alienation from scientific authorities and expert knowledge

Reflexive Modernization Theory

- More educated
- Interested in and aware of the S&T topic
- Especially so in more democratic nations

Institutional Alienation Perspective

- Less educated
- Distrusting scientists
- Especially so in more democratic nations

The same effect for actual engagement and support for democratic control over science?

- Special Eurobarometer 73.1 (2010) on Science and Technology
- ~30000 observations from 32 countries
- Two sets of multi-level regressions models with binary response (actual participation and support for democratic control)

Dependent Variable – 1.
Actual Engagement

- Attending public meetings or debates about science and technology
- Signing petitions or joining street demonstrations on matters of nuclear power, biotechnology or the environment
- Participating in the activities of a non-governmental organisations dealing with science and technology related issues

= 0 - have not engaged in any of those three activities presented
= 1 - have engaged *at least* in one of them. Mean = 0.4,SD = 0.49

Dependent Variable – 2. Support for Democratic Control

= 0 *(Passive role)*

- The public **does not need to be involved** in decisions about science and technology
- Decisions about science and technology should be made by scientists, engineers and politicians, and the public should be **informed** about these decisions

= 1 *(Active role)*

- The public should be **consulted** and public opinion should only be **considered** when making decisions about science and technology
- Public opinion should be **binding** when making decisions about science and technology
- NGOs should be **partners** in scientific and technological research (Mean = 0.50, SD = 0.50)

- Years of Education
- Knowledgeability = Interest + Awareness in the S&T Topic
- Distrust in Scientists (binary, Mean = 0.31, SD = 0.46)
- Controls: Gender, Age, Occupation Level, Personal Scientific Background, Parents' Scientific Background

- Democracy Index by the Economist Intelligence Unit
- Scale from 1 (poor) to 10 (great performance)
- The range for countries in the dataset: from 5.73 (Turkey – Hybrid Regime) to 9.80 (Norway – Full Democracy)

Ration of Engagement to Democratization

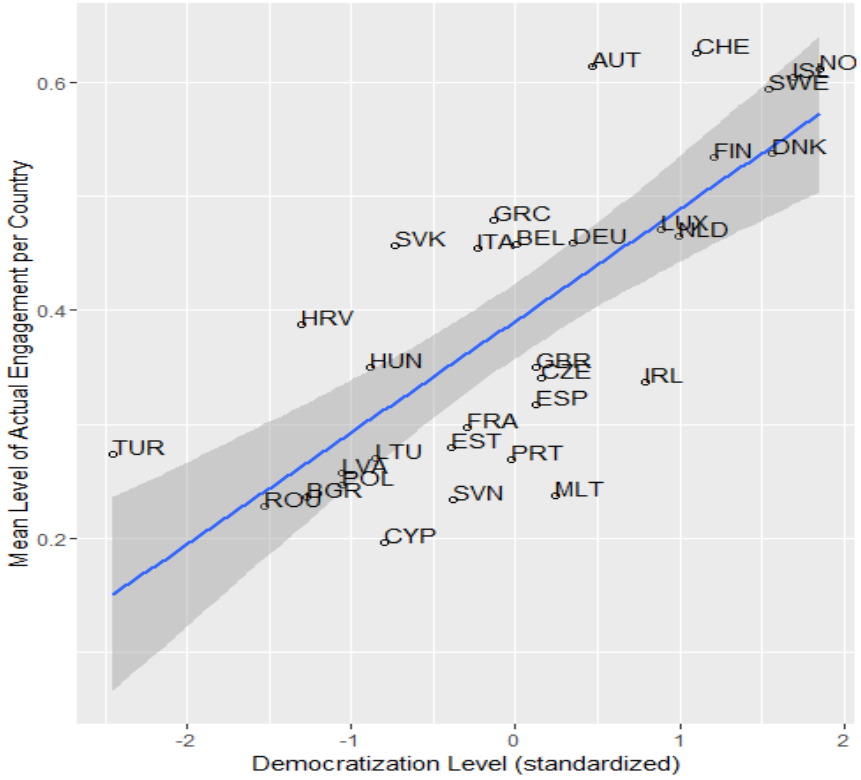

Figure 1(a). Ratio of mean level of actual engagement to democratization level

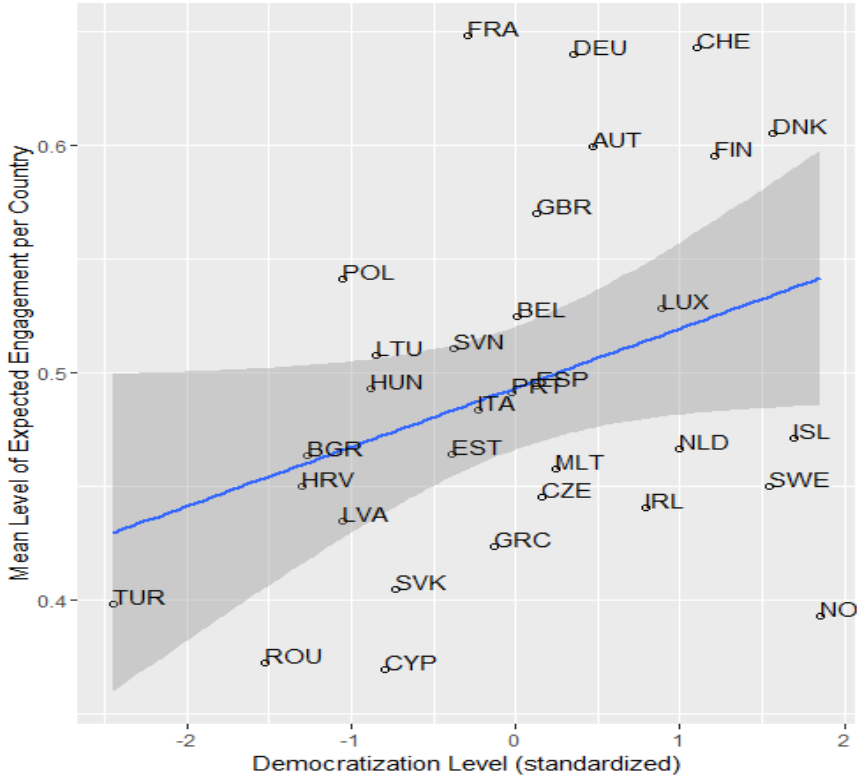

Figure 1(b). Ratio of mean level of expected engagement to democratization level

Models on Actual Participation

Democratization Level	**0.394*****	**0.303*****	0.438***
Gender Female	-0.067**	0.072**	0.072**
Age	0.003	0.066***	0.070***
Expected Public Role Active	0.267***	0.268***	0.269***
Occupation Managers (base = Self-Employed)	0.459***	0.269***	0.255***
Parents Scientific Background No	-0.620***	-0.467***	-0.452***
Personal Scientific Background Yes	0.517***	0.280***	0.279***
Years of Education		**0.083*****	0.087***
Knowledgeability		**0.448*****	0.455***
Distrusting Scientists		**0.078*****	0.079
Democratization x Years of Education			**-0.008**
Democratization x Distrusting Scientists			**-0.153*****
Democratization x Knowledgeability			**-0.045****

Marginal Effect of Distrust in Scientists and Knowledgeability on Actual Participation

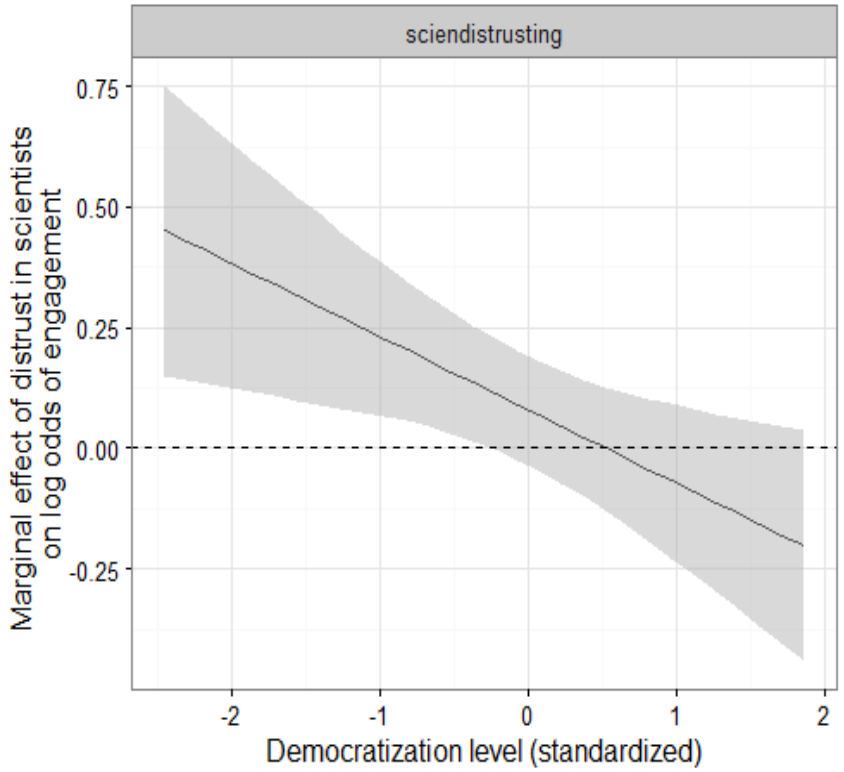

Figure 2(a). Estimated coefficient of distrust in scientists on log odds of engagement by democratization level

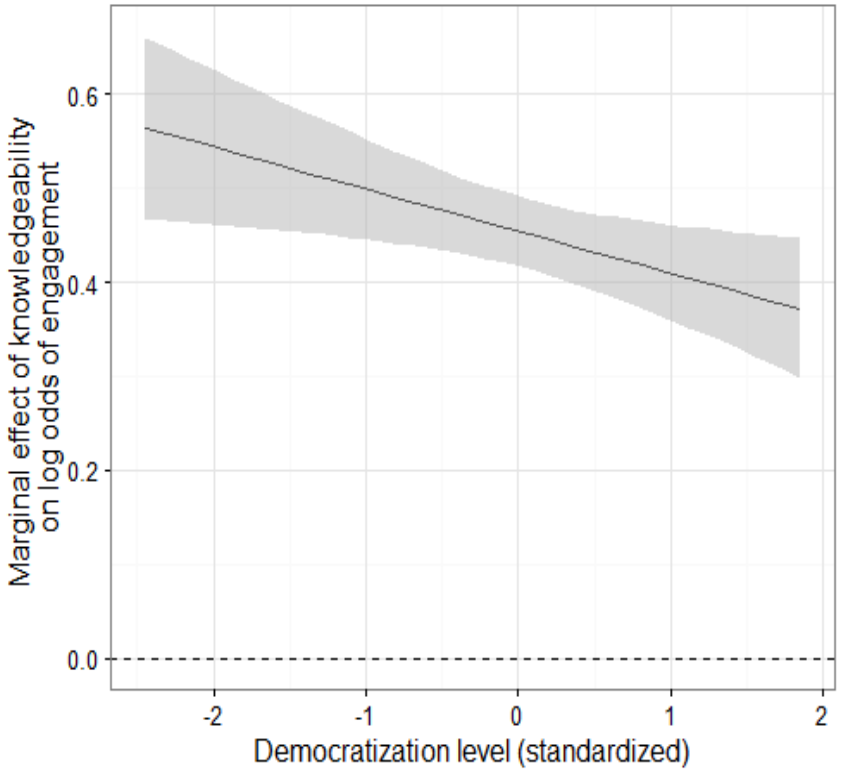

Figure 2(a). Estimated coefficient of knowledgeability on log odds of engagement by democratization level

Models on Support for Democratic Control

Democratization Level	**0.109****	**0.111****	0.062
Gender Female	0.034	0.041	0.045*
Age	-0.045**	-0.046**	-0.045**
Occupation Managers (base = Self-Employed)	0.095*	0.107*	0.107*
Parents Scientific Background No	0.001	0.004	0.007
Personal Scientific Background Yes	0.020	0.024	0.017
Years of Education		**-0.001**	-0.002
Knowledgeability		**0.032****	0.040**
Distrusting Scientists		**0.345*****	0.352***
Democratization x Years of Education			**0.011*****
Democratization x Distrusting Scientists			**-0.124*****
Democratization x Knowledgeability			**0.014**

Marginal Effects of Education and Distrust in Scientists on Expected Participation

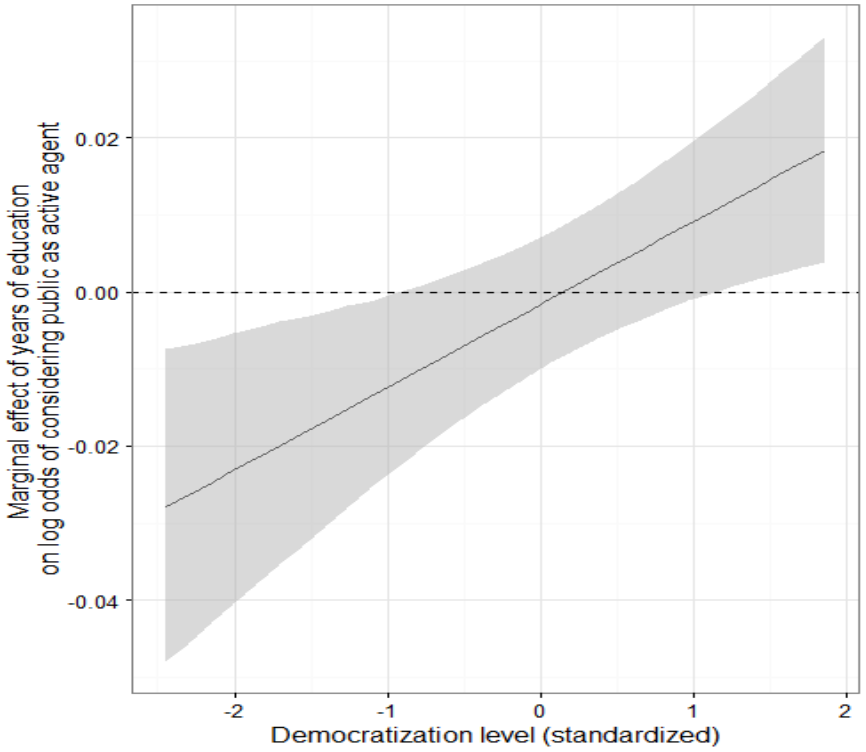

Figure 3(a). Estimated coefficient of years of education on log odds of considering public as an active agent by democratization level

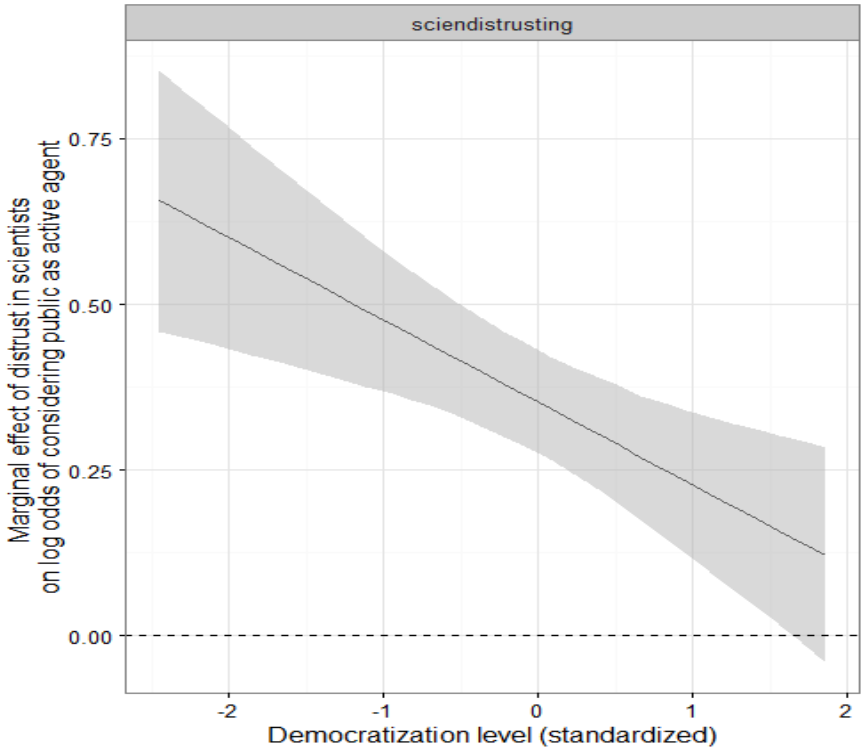

Figure 3(a). Estimated coefficient of distrust in scientists on log odds of considering public as an active agent by democratization level

- Country's democratization level is crucial both in explaining actual and expected level of engagement. The more democratic political regime country has – the more it is likely for lay people to participate and expect public to participate in science policy-shaping
- Support for democratic control over science is poorly explained by present first-level predictors. Only knowledgeability and distrust in scientists have some meaningful significant effects

- Speaking of factors of actual engagement, it seems that reflexive modernization explanation suits better. Those having more years of education and also more intellectually demanding job (managers, self-employed, white collars), as well as those who are interested and informed in this topic are more likely to engage
- However, distrusting scientists being treated as an indicator of overall alienation from science institution and expert knowledge also makes participation more possible, what speaks in favor of institutional alienation thesis
- With increase in democratization the effect of distrust on participation tends to diminish

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Thank you for your attention!

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