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**Perceptions, narratives and debates about
nanotechnologies**
Data, assumptions, and a critical appraisal

Simone Arnaldi

Keen Regions Workshop at NanotechItaly 2011
*Governance and development of nanotechnologies:
a regional joint action plan (Venice, November 23, 2011)*



Summary

- ❑ “Full disclosure”: my background, something about CIGA
- ❑ Assumptions on public perception of and media narratives on nanotechnology
- ❑ Assumptions on participation and public policy
- ❑ Closing remarks



“Full disclosure”



My background

- Sociologist
- Expectations about science and technology and public policy

Something about CIGA

- Interdepartmental Centre for Environmental Law Decisions and Corporate Ethical Certification of the University of Padova
- Joint initiative of the Department of Philosophy and the Department of Comparative Law
- Interdisciplinary research on emerging technologies and society (law, philosophy, sociology)
- Strategic partnership with the European Center for the Sustainable Impact of Nanotechnology (ECSIN) in the Nanotechnology Cluster in the Veneto Region



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Assumptions on public perception of and media narratives on nanotechnology



Assumptions about nanotechnology perception and representations:

- The public has a negative view of nanotechnology**
- Nanotechnology is a risky business
- The more acknowledged is the public, the more favourable the attitude to nanotechnology
- Health and environmental risks are crucial in shaping perceptions
- Media representations of nanotechnology are negative



The public has a negative view of nanotechnology/1

	Positive		Negative		No effect		Don't Know	
	2010	2005	2010	2005	2010	2005	2010	2005
SE	63	44	5	6	8	4	24	22
DK	61	66	9	6	11	7	19	24
NO	59	52	6	7	6	4	29	37
CH	47	46	10	13	13	5	30	36
FR	45	41	8	6	8	4	39	49
DE	43	53	13	11	7	4	37	32
EU	41	48	10	8	9	4	40	0
UK	40	42	5	5	8	4	47	49
IT	36	57	11	5	13	5	40	33

Source: Eurobarometer 63.1 & 73.1 (2006, 2010)



The public has a negative view of nanotechnology/2

	I have heard		I don't have heard		
	2010	2005	2010	2005	
					more awareness
SE	75	61	25	39	
DK	77	69	23	31	
NO	78	NA	22	NA	
					stable awareness
CH	76	NA	24	NA	
FR	54	55	46	45	
DE	65	50	35	50	
EU	46	44	54	56	
UK	48	44	52	56	
IT	37	40	63	60	
					less awareness

Source: Eurobarometer 64.3 & 73.1 (2006, 2010)

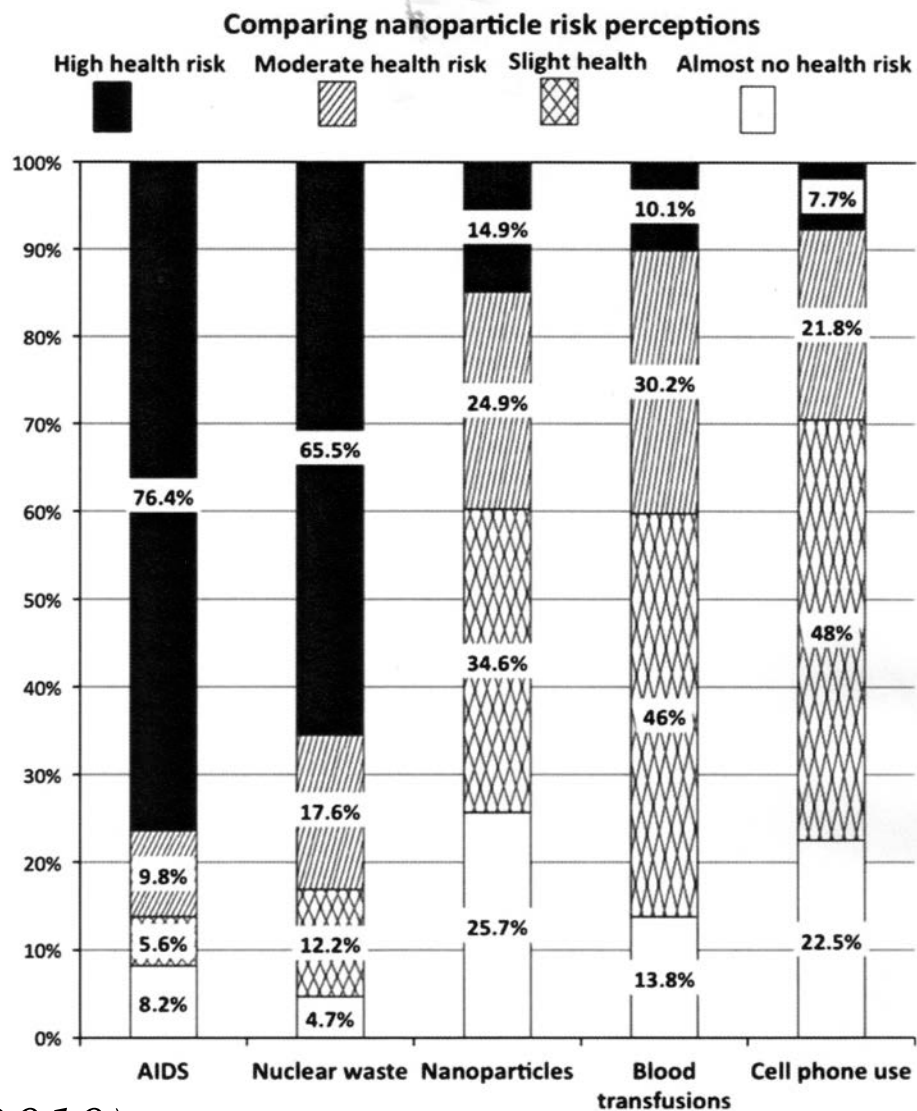


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**Nanotechnology is a
risky business/1**

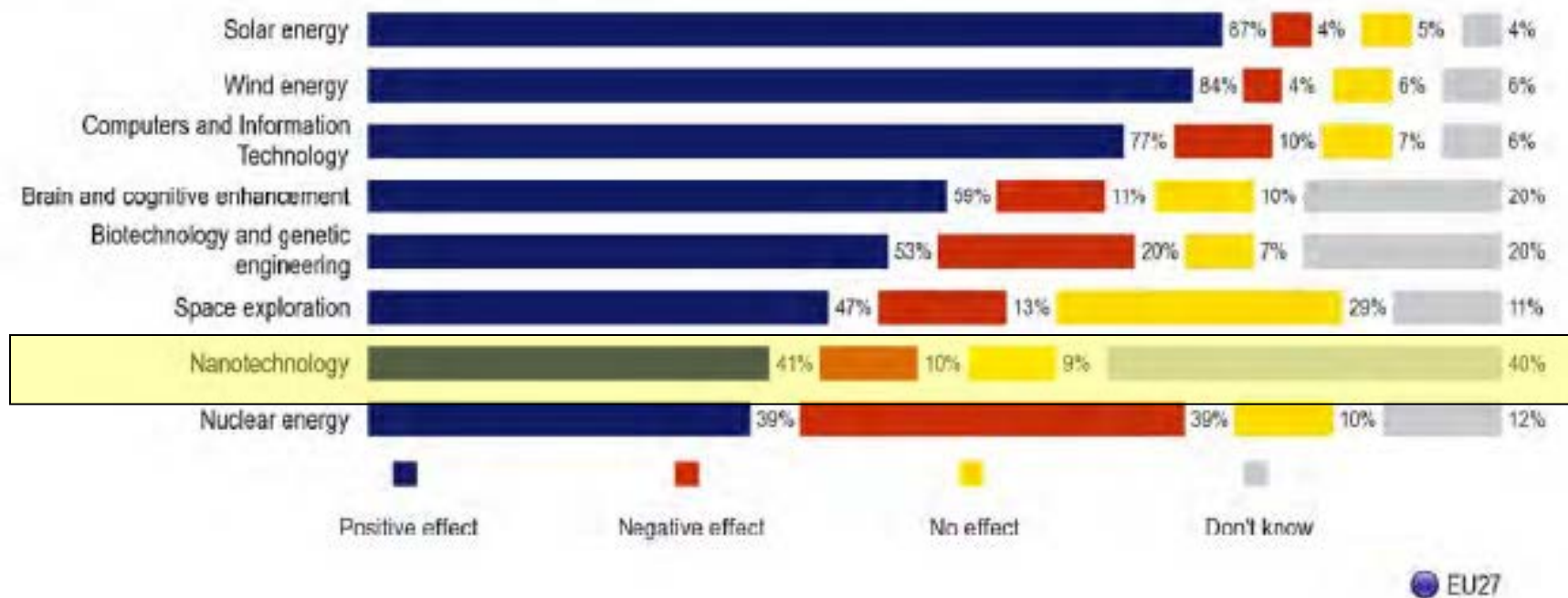


Source: Berube et al. (2010)



Nanotechnology is a risky

QB1. I am going to read out a list of areas where new technologies are currently developing. For each of these, do you think it will have a positive, a negative or no effect on our way of life in the next 20 years?



Source: Eurobarometer 73.1 (2010)

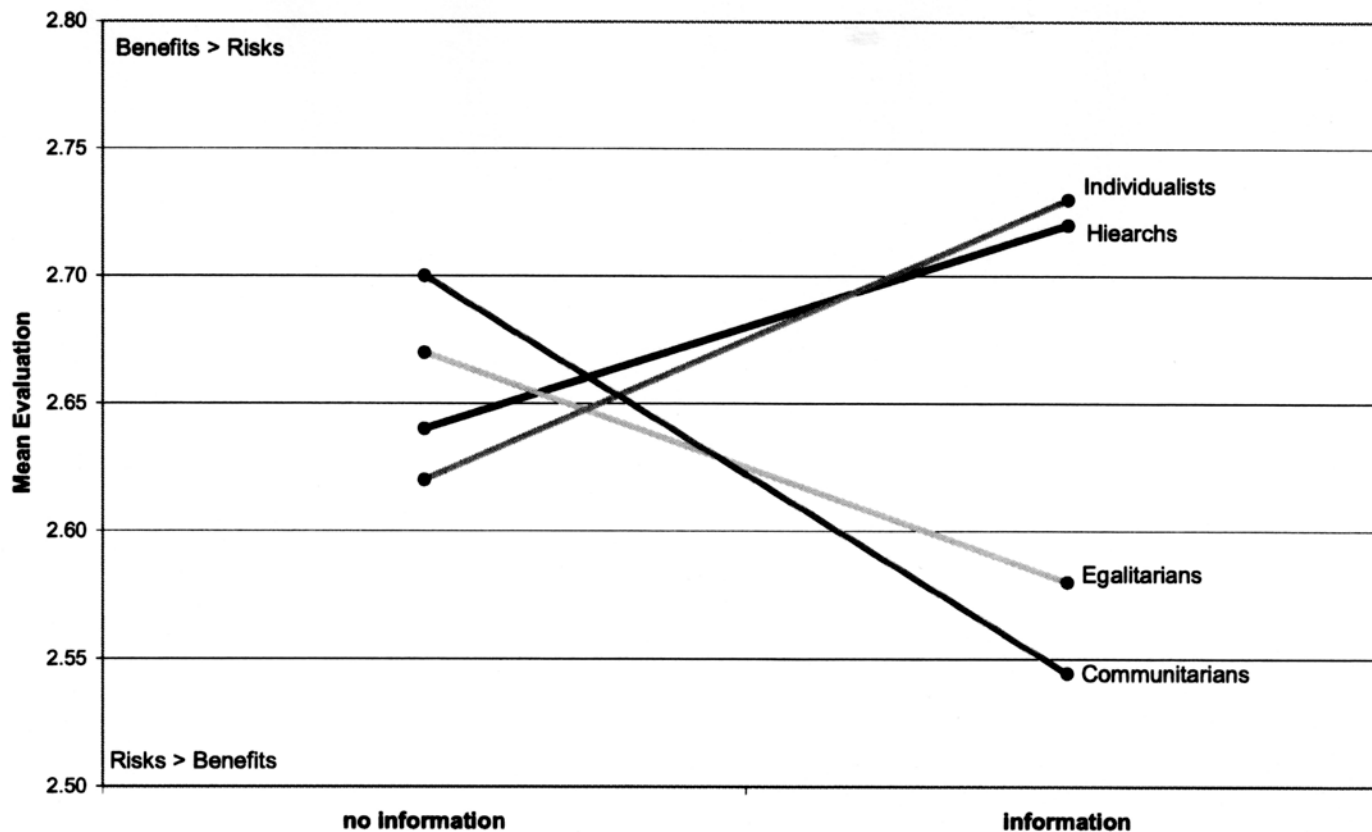


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The more acknowledged is the public, the more favourable the attitude to nanotechnology/1



Source: Kahan et al. (2007)

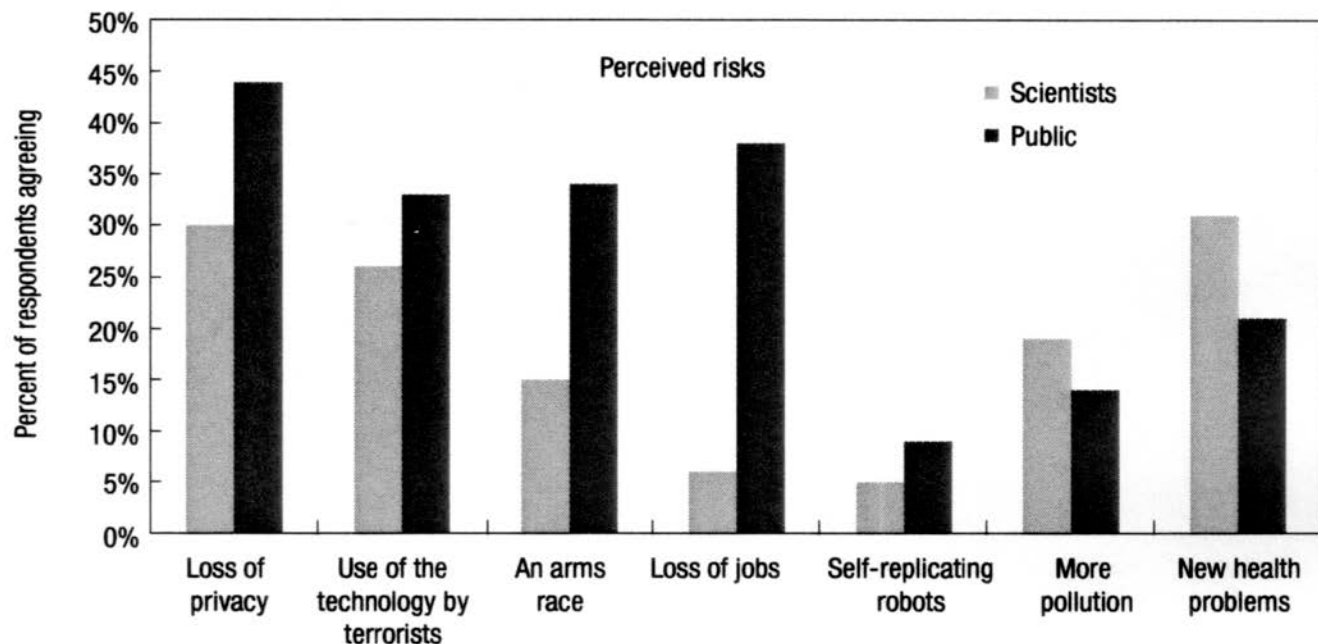


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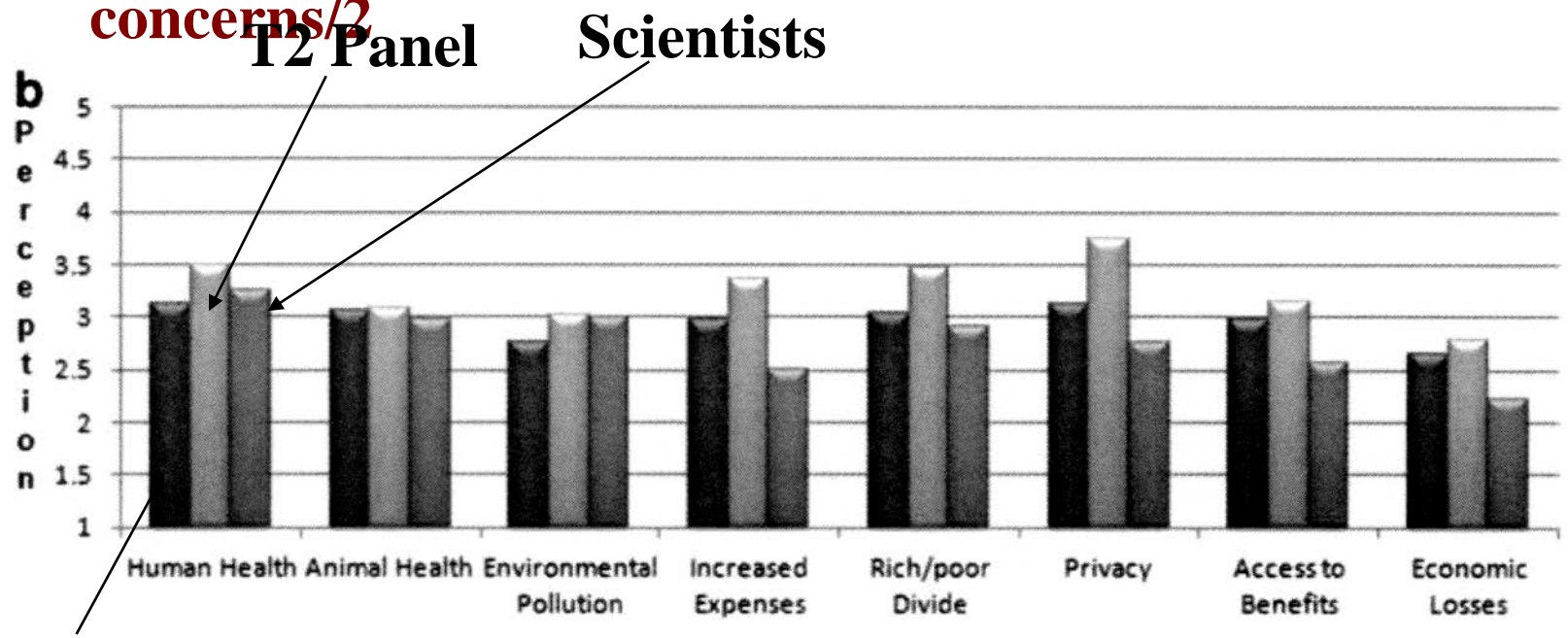
Health and environmental risks are the major public concerns/1



Source: Scheufele et al. (2007)



Health and environmental risks are the major public concerns/2



T1 Panel

Source: Priest et al. (2010)



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Media representations of nanotechnology are negative/1

	Stephens (2005) (N=350)	Anderson et al. (2005) (N=344)	Laing (2004) (N=381)	Zimmer et al (2010) (N=1696)	Te Ulve (2006) (N=237)
Scientific progress and discovery, celebration of science	41	24	33	71	61
Economics and business impact, funding	30	23	40	17	11
Popular culture, science fiction	5	27	0	0	12
Social implications, risks and oversight	20	9	21	13	5
Other	5	17	6	0	9



Media representations of nanotechnology are negative/2

Anderson et al. (2005)	UK	2003-2004	Risks > Benefits	16 %
Friedman & Egolf (2005)	US	2000-2004	Mentioning negative aspects	10 %
Friedman & Egolf (2008)	US	2000-2006	Mentioning risks	7%
Laing (2004)	US/(CA)	2004	Mentioning risks	24 %
Stephens(2005)	US/EU	1988-2004	Risks > Benefits	18 %
Zimmer et al. (2010)	D	2000-2007	Mentioning risks	14 %



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Assumptions about participation and public policy



Assumptions about participation and public policy:

- Participation drives to social acceptance of (nano)technology



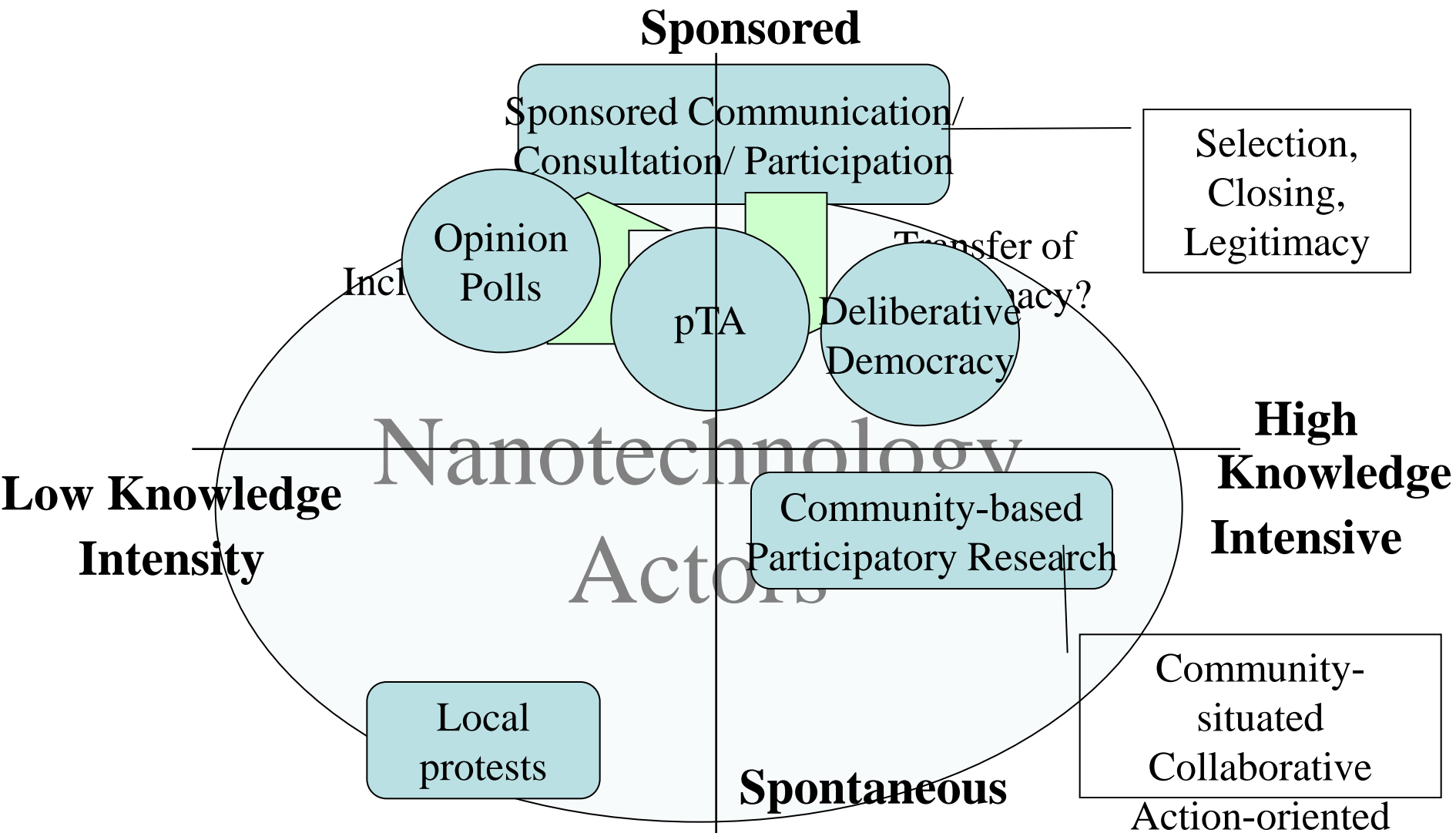
Participation drives to social acceptance of (nano)technology/1

<i>Region/Country</i>	<i>No. exercises</i>	<i>Region/Country</i>	<i>No. exercises</i>
Americas	14	Europe	47
<i>Brazil</i>	<i>1</i>	<i>Denmark</i>	<i>2</i>
<i>Mexico</i>	<i>1</i>	<i>France</i>	<i>7</i>
<i>USA</i>	<i>12</i>	<i>Germany</i>	<i>3</i>
Oceania	2	<i>Netherlands</i>	<i>2</i>
<i>Australia</i>	<i>1</i>	<i>Norway</i>	<i>1</i>
<i>New Zealand</i>	<i>1</i>	<i>Spain</i>	<i>1</i>
Europe	47	<i>Switzerland</i>	<i>3</i>
<i>Austria</i>	<i>2</i>	<i>United Kingdom</i>	<i>6</i>
<i>Belgium</i>	<i>1</i>	<i>European Union</i>	<i>17</i>

Source: Lafitte and Joly (2008)



Participation drives to social acceptance of (nano)technology/2





Participation drives to social acceptance of (nano)technology/3

Closing Vs. Exploring

Selection	Plurality
Guidelines	Possibilities
Legitimacy	Conditionality
Consensus	Divergences



Participation drives to social acceptance of (nano)technology/4

“Extended conditions of experimentations”

- Social configurations of innovation (e.g. roles and mutual representations)
- Framing of issues (e.g. what is relevant as “risk & benefit”?)
- Local knowledge (e.g. ecosystems)



Closing remarks



Summary/1:

- The public has a negative view of nanotechnology**
 - Attitude is positive**
 - Familiarity is still low**
- Nanotechnology is a risky business**
 - Nanotechnology is considered less risky than other technologies
 - Judgement is suspended (Dont' Know)
- The more acknowledged is the public, the more favourable the attitude to nanotechnology**
 - Intervening variables (social values, cultural outlooks) affect attitudes and opinions



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Summary/2:

- Health and environmental risks are crucial in shaping perceptions**
 - Social and economic impacts are major (bigger?) concerns as well**
 - Experts and citizens' concerns diverge**
- Media representations of nanotechnology are negative**
 - Coverage is overwhelmingly positive**



Summary/2:

- ❑ Health and environmental risks are crucial in shaping perceptions
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 - ❑ **Coverage is overwhelmingly positive**



Summary/3:

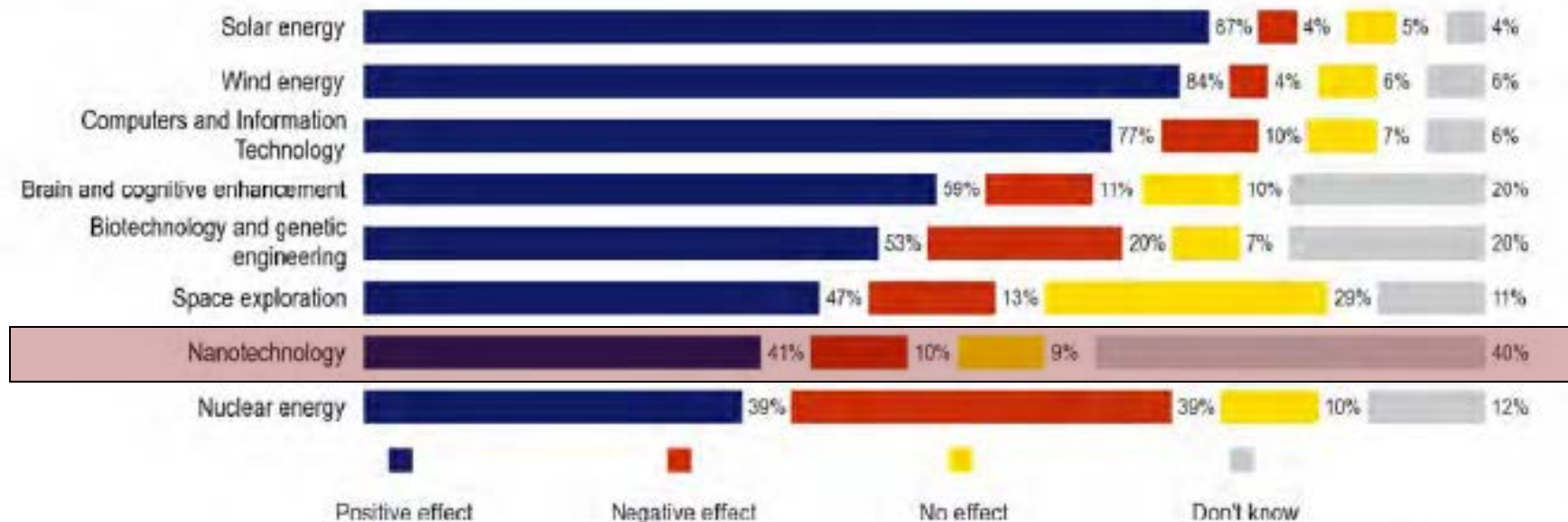
- ❑ **Participation drives to social acceptance of (nano)technology**
 - ❑ **Dual dynamics of legitimacy and consensus building inside and outside participatory mechanisms**
 - ❑ **Deliberate vs. *de facto* technology assessment**
 - ❑ **Participation as a social learning process about “extended conditions of experimentation”**



A last remark: a false alternative?

❑ Overcoming nanotechnology vs. nanotechnologies

QB1. I am going to read out a list of areas where new technologies are currently developing. For each of these, do you think it will have a positive, a negative or no effect on our way of life in the next 20 years?





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Thanks for your attention!

Simone Arnaldi

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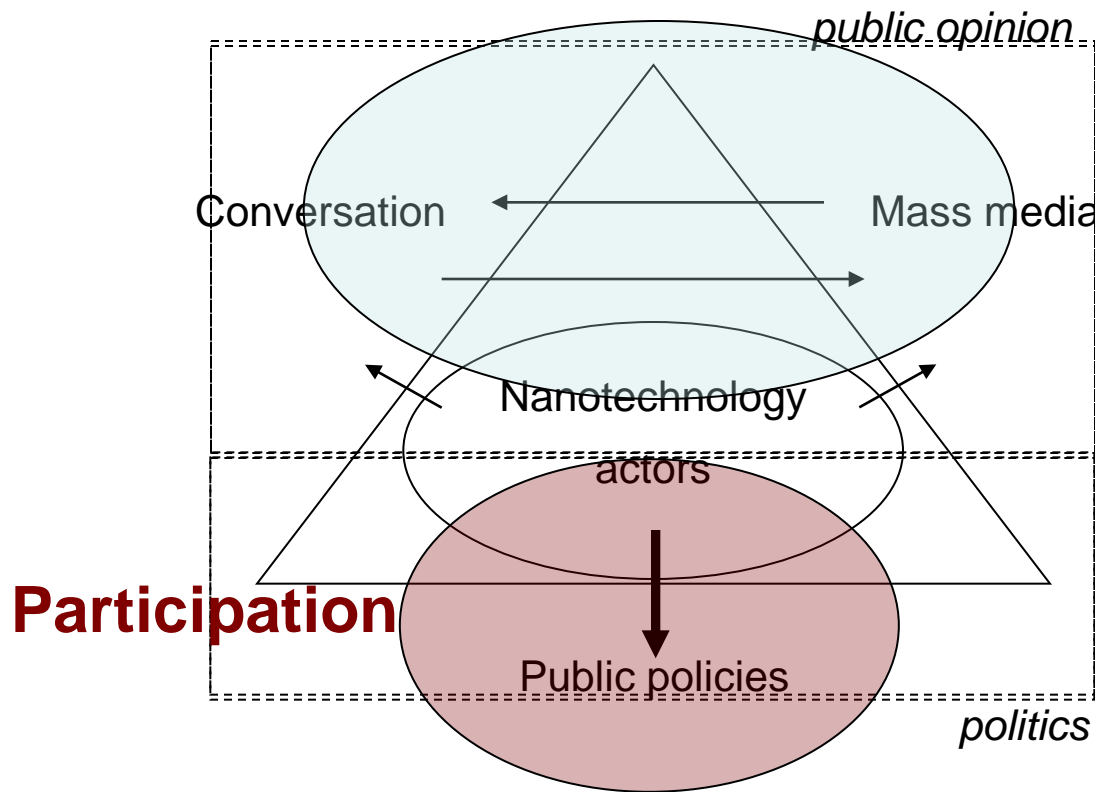
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**A perspective on
“public science and technology”**



A perspective on “public science and technology”



Perception & Representations

Adapted from Bauer (2002)

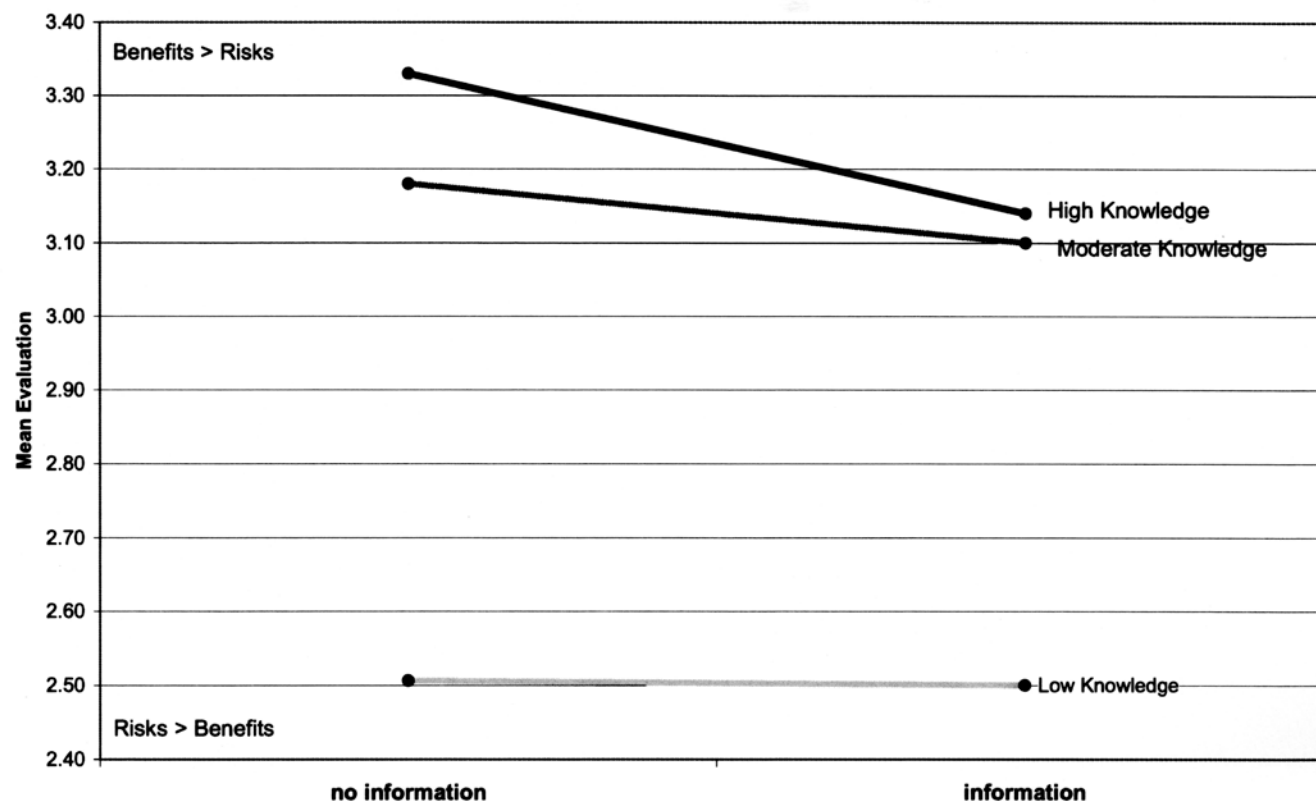


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- Health and environmental risks are crucial in shaping perceptions
- Media representations of nanotechnology are negative
- Media (and public) interest in nanotechnology is booming



The more acknowledged is the public, the more favourable the attitude to nanotechnology/1



Source: Kahan et al. (2007)



The more acknowledged is the public, the more favourable the attitude to nanotechnology/3

- Trust & (perceived) risks (e.g. industry, oversight organizations)
- Scientific & social (experiential) knowledge (e.g. actors' past performances)
- Facts & social imaginaries (e.g. MNCs vs. SMEs)

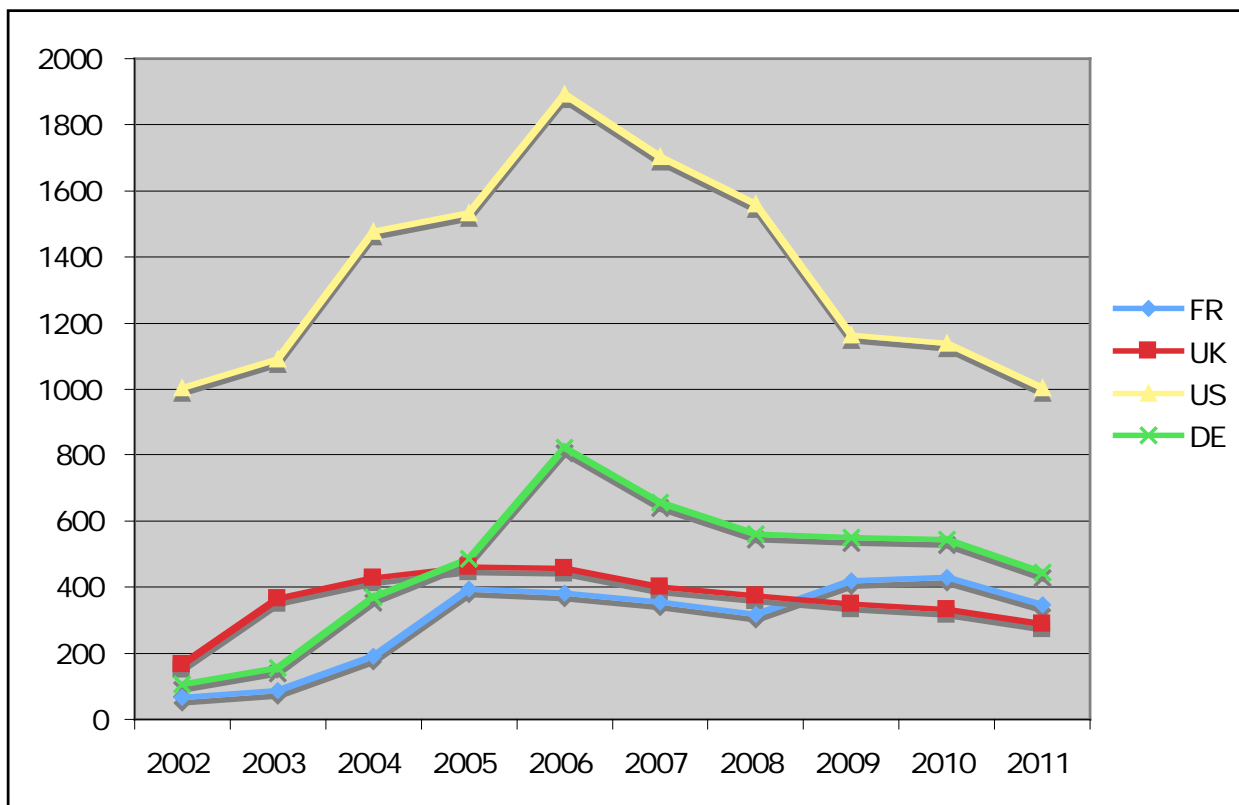


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Media (and public) interest in nanotechnology is booming/1

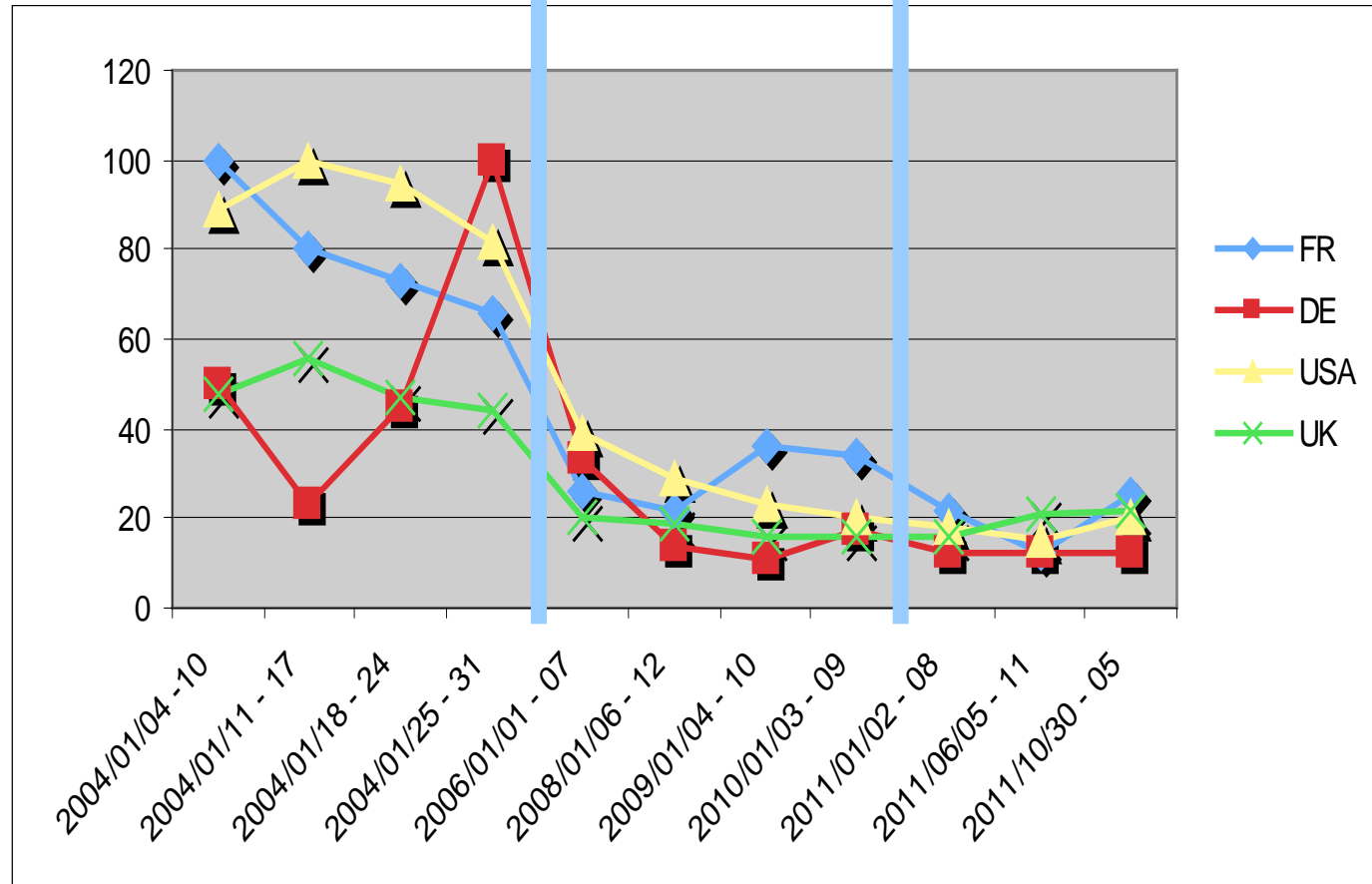


Newspaper coverage



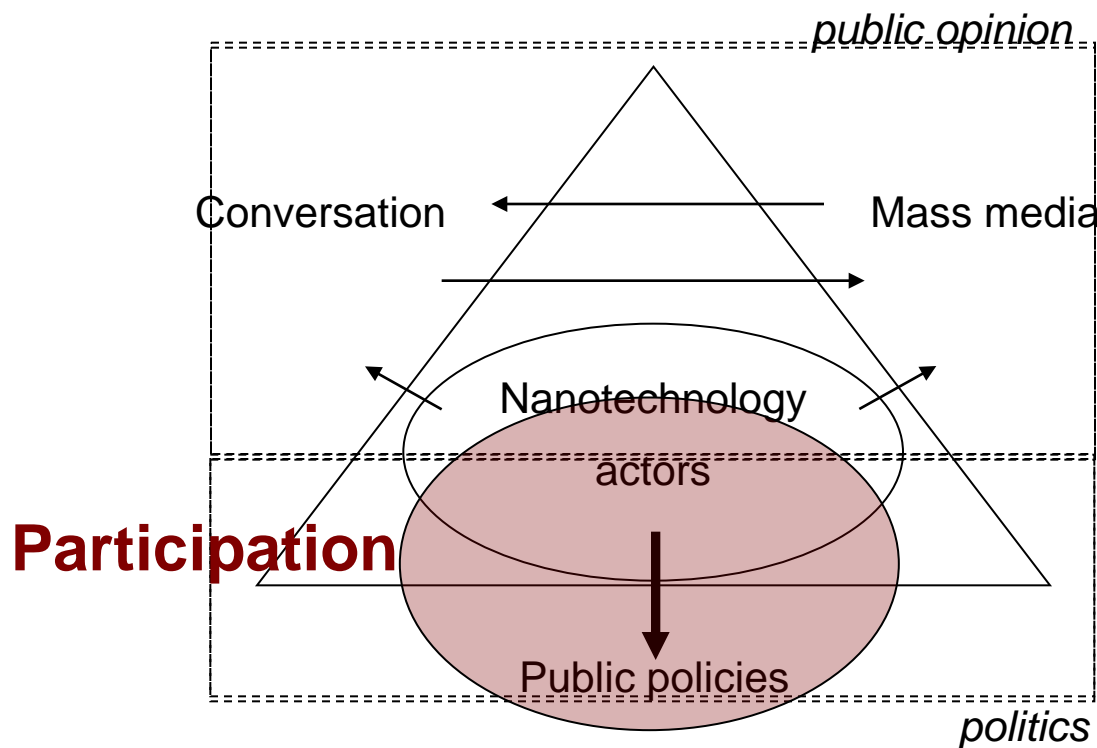
Media (and public) interest in nanotechnology is booming/2

Google searches



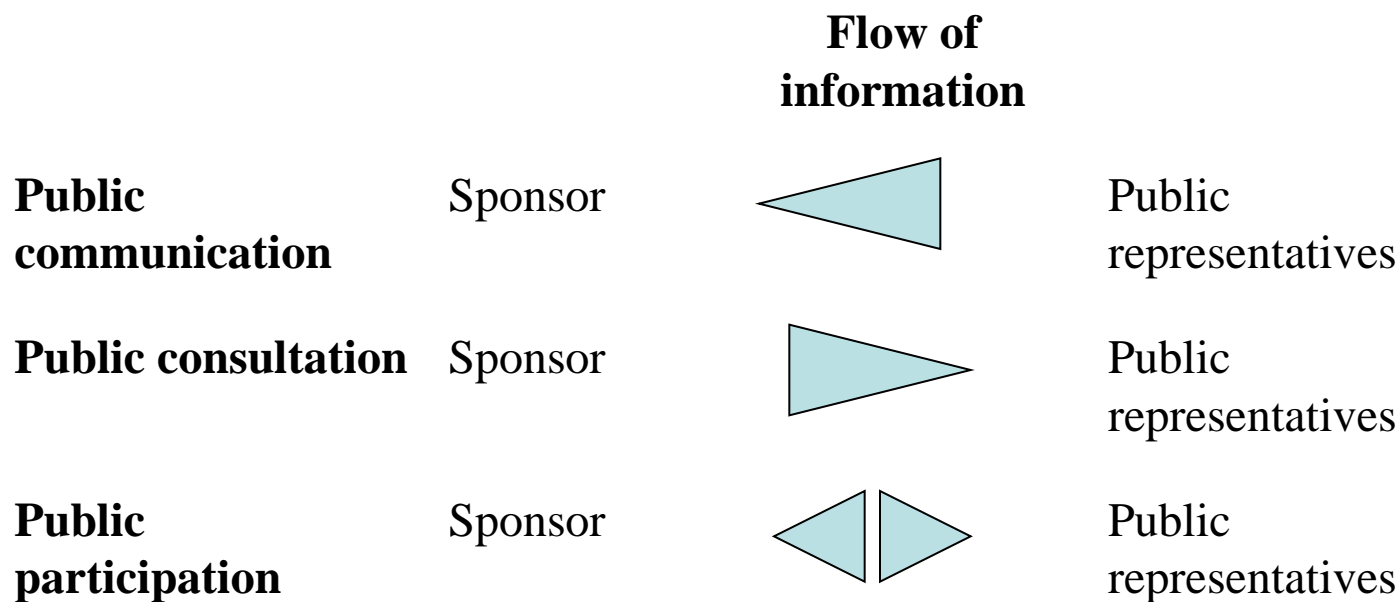


Participation drives to social acceptance of (nano)technology/2





Participation drives to social acceptance of (nano)technology/2



Source: Rowe and Frewer (2005)



Misunderstood alternatives?/1:

Rethinking the “citizen as expert” frame

- Expertise or omniscience?
- Scientific or social knowledge?
- Risk or governance?



Summary of the summary/1:

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False alternative/1:

Rethinking the “citizen as expert” frame

- Expertise or omniscience?
- Scientific or social knowledge?
- Risk or governance?**