

Working Group 3: Risk Perception and Social Response to Emerging Nanotechnologies

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Working Group leader



WG 3 projects

UCSB, Cardiff (UK), UBC (CA)

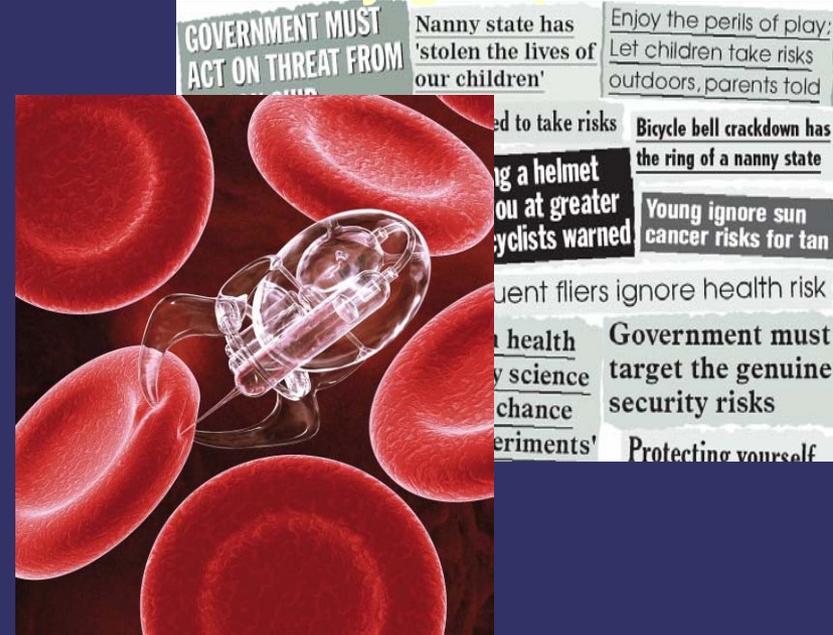
- 1) Multiple party risk perception
- 2) Public participation/deliberation

UCSB, ANU (AUS)

- 3) Media coverage of societal issues
- 4) Nano advocacy and protest networks

Theoretical framework-SARF

- Social amplification and attenuation of risk
- Risk amplification and technological stigmatization
- Framing of nano by media and advocacy groups



Risk Amplification and Stigmatization

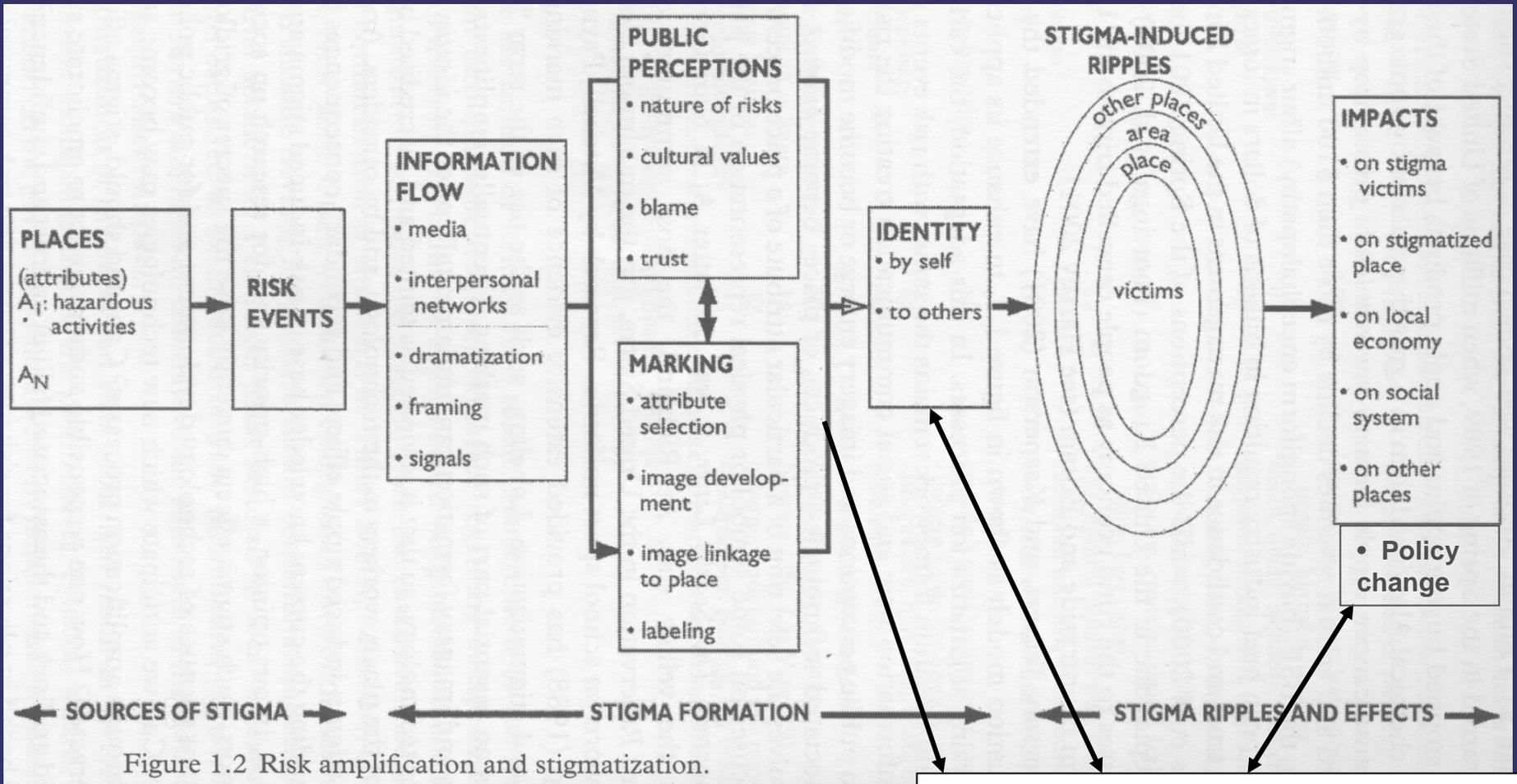


Figure 1.2 Risk amplification and stigmatization.

Team 1: Multiple Party Risk Perception and Public Deliberation

Premise: Nanotechnologies as risk objects will evoke both attenuation and amplification of risk; amplification may lead to stigmatization; deliberation effects on amplification or attenuation unknown

Primary Research Questions:

- How do diverse experts and publics view risks and benefits of nanotechnologies?
- What kinds of public involvement are likely to be most effective in US?

Initial Foci: experts' risk beliefs; format for upstream public deliberation

Research team

- Barbara Herr Harthorn (UCSB)
- David Awschalom (UCSB)
- Michael Goodchild (UCSB)
- Elisabeth Gwinn (UCSB)
- Susan Stonich (UCSB)
- Nick Pidgeon (Cardiff Univ, UK)
- Tee Rogers-Hayden (Cardiff U)

- Francesca Bray (Edinburgh, UK)
- Milind Kandlikar (UBC)
- Terre Satterfield (UBC)

CNS Grad Fellows

- Karl Bryant, Soc
- Hillary Haldane, Anthro
- Joe Summers, Engineering

Multiple Party Risk Perceptions & Beliefs Expert Study—Harthorn, Satterfield

Aims: Interview 4 groups about nano risks/benefits

- Academic nanoscientists
- Private sector nanoscientists
- Nanotoxicologists
- Regulators, politicians



Academic nanosci sample

DISCIPLINE	Senior Female	Junior Female	Senior Male	Junior Male
Mechanical Engineering				
Chemical Engineering				
Electrical Engineering				
Material Science				
Physics				
Chemistry				
Biology				

Status:

- In progress; complete data collection in 2007

Findings (in progress):

- Differences in nanosci sample re: validity, innovation, responsibility
- Possible expert attenuation

Future research:

- Comparative national survey--decision pathway method (early 2008)
 - Instrument development
 - Co-funding (for comparative UK, China)
- Qualitative studies in US

Modes of Public Participation in Nano Deliberation study—Pidgeon, Harthorn

Aims: Assess methods for upstream deliberation in the US using analytic-deliberative approach

- Develop and pilot a new protocol
- **Conduct the 1st systematic US/UK comparative study**
- Meta analysis of nano deliberation

Status:

- 3 pilots over 3 months 2006-07
- comparative deliberation **completed Feb 2007**; data analysis in progress; preliminary findings summer 2007

Findings (in progress):

- Different responses across technologies and cultures/nations likely

Future research:

- W. Coast site for ASU consensus workshop (Mar 2008)
 - extend comparative potential—same site, diff formats; UK
- Assess possible study of amplification/attenuation effects

Comparative deliberation Study design

Study format:

- 4 groups, 2 sites
- Run concurrently in US and UK
- Comparability high
- Closely matched local demographics

- 4.5 hrs, different formats w/in

Nano applications covered:

- Health and human enhancement
- Energy futures

Team 2: Nano-Framing by Media and Groups

Premise: Media coverage of nano in concert with activities of organized groups will help shape social response and public policy.

Initial Foci:

- English-language news coverage of nano and society issues.
- Online activities of ngo's and advocacy groups.



Research team

- Bruce Bimber (UCSB)
- Rob Ackland (ANU & Oxford)

CNS grad fellows

- David Weaver (Poli Sci)
- Jerry Macala (Chem)

Media & Groups: *News coverage*

Questions: Have distinct frames emerged in the media? What events drive news?

Theory: Coverage & framing will be episodic, yet the issue is emergent and unpredictable; mass media will focus on institutional developments and ngo activity that is directly connected to government.

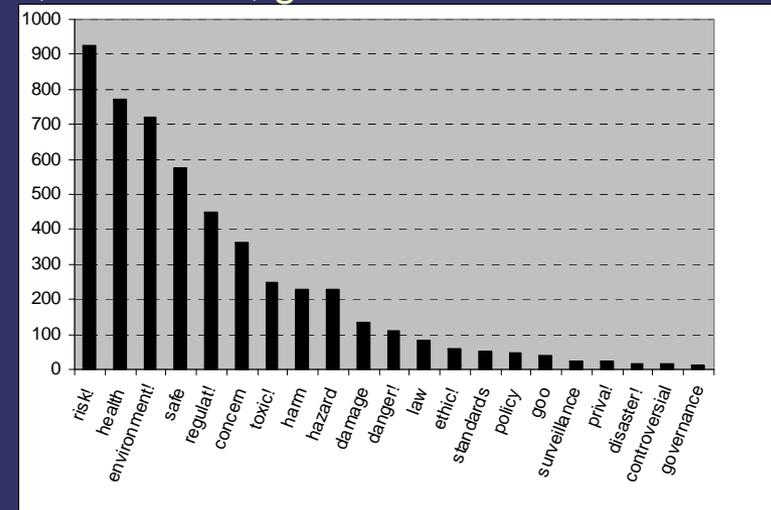
Technique: Searched in global English-language media for a year of news coverage

- Policy-area concepts: environment, health, privacy, goo (self-replication),
- Risk concepts: concern, harm, hazard, danger, disaster, toxic, safety, controversy
- Policy-process concepts: regulation, law, ethics, standards, governance

Results: 1547 articles in 2006

1. Frequency Distribution of Concepts

- 5 most frequent terms: risk, health, environment, safety, regulate
- 5 least frequent terms: governance, controversy, disaster, privacy, surveillance

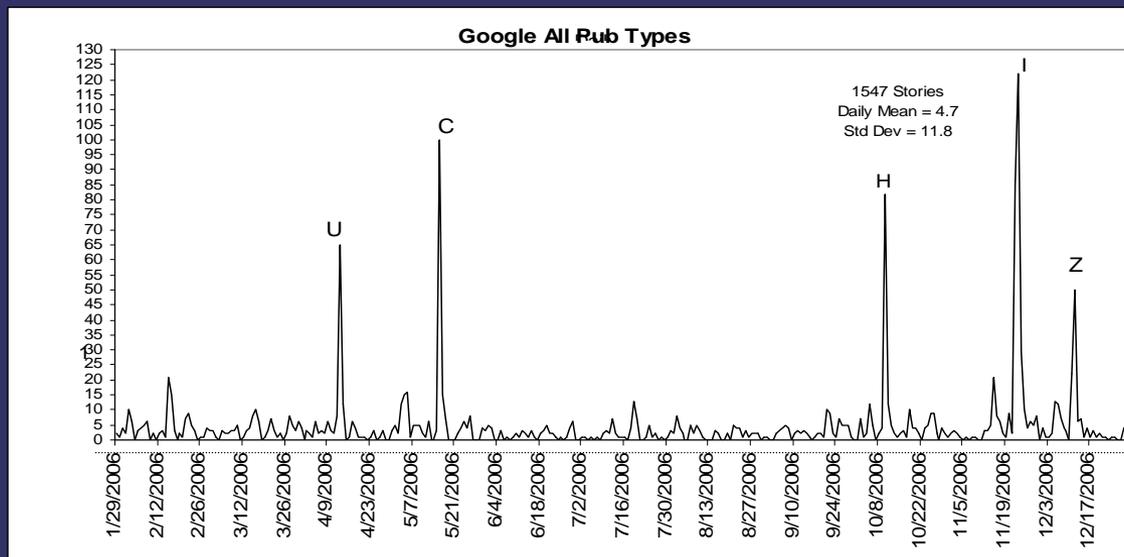


2. Cluster Analyses of Concept Linkages

- environment & health co-occur with each other and with regulation & risk; other topics (e.g. privacy) also appear with environment & health rather than separately; frames are more thematic and broad than narrow and episodic, apparently because no risk events and other developments so far.

3. Event & Source Analysis

- Daily average = 5 stories in English globally including societal issues
- In 2006, 5 news events occurred (defined as an increase > 2 std. dev. in number of news outlets covering nano): FDA announces meeting, petition to FDA, FDA meeting; EPA regulation, Berkeley ordinance. All involve government institutions.



Media and Groups: *Web Space*

Analysis: VOSON, ANU (Ackland et al).

Piloted and reported exploratory results for web-crawling and visualization techniques for identifying NGO's and their links to one another and to other institutions online.

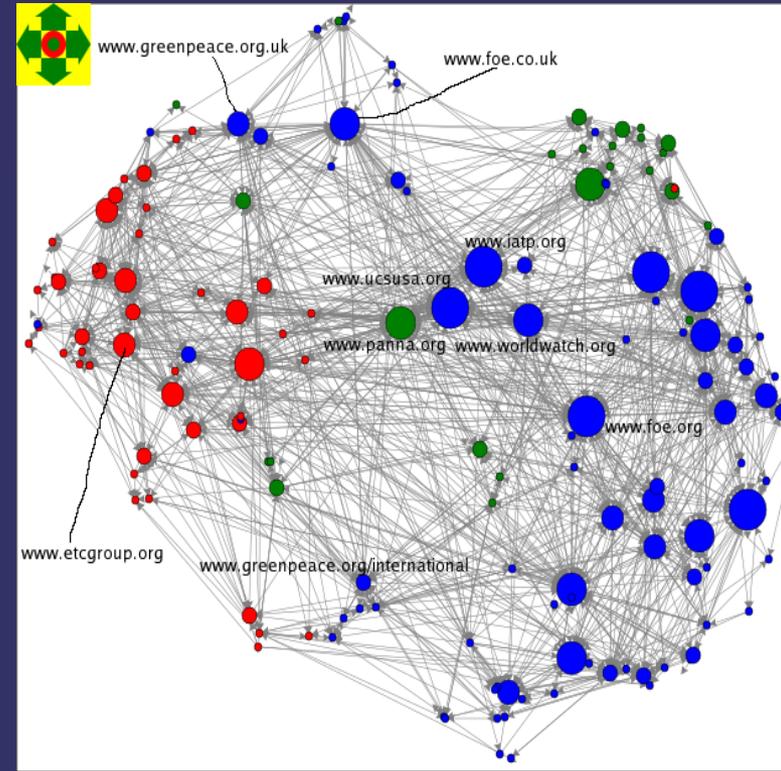
Question: What explains prominence in web-space among organizations addressing nano?

Theory: Online prominence should be power-law distributed and explained by age-in-network and resource provision; prominence in traditional media should be predicted by direct or indirect engagement with governmental institutions and by participation in media events such as protests.

Nano advocacy and protest networks

Results:

- Prominence of anti-nano groups in web space is predicted from: age in the network; linkages among federated groups (e.g. Greenpeace); and factors such as production of informational resources & reports (e.g. ETC Group).
- Framing and language “contagion” of novel terms (“atomtech,” “nanotoxicity”) outward from sites is weak.



Next steps:

- Expanding analysis to Government, University Lab, NGO, and commercial sites (with Newfield and WG2).
- Examining relationship between online linkages, political action, and media coverage