



# Attitudes toward science : A social psychological analysis

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# Plan

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The determinants of attitudes towards science

- (Rutjens et al., 2017)

The underpinnings of conspiracy beliefs

- (Douglas et al., 2017; Klein et al, 2010)

The constraints in opinion formation in the Internet age

- (Bronner, 2013)

# Some facts showing cynicism

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There seems to be more than reasonable skepticism about science...

*What are the factors about cynicism about science that have people think*

- Science and its method is fundamentally corrupt*
- Well-established and rigorous findings cannot be trusted*
- Scientific evidence and opinions have the same epistemic value*

# The determinants of attitudes towards science

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## **Cognitive limitations** (not of the uneducated but of humans)

- Understanding science requires cognitive skills
- Interestingly, what are the tendencies of normal cognitive functioning
  - **Essentialism** : discrete categories when things are complex and fuzzy
  - **Teleology** : a sense of purpose when there is none
  - **Agency** : the ascription of intentionality when science posits no such thing
- Most scientific theories are at odds with these features

# The determinants of attitudes towards science

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## Moral considerations (what is right and wrong)

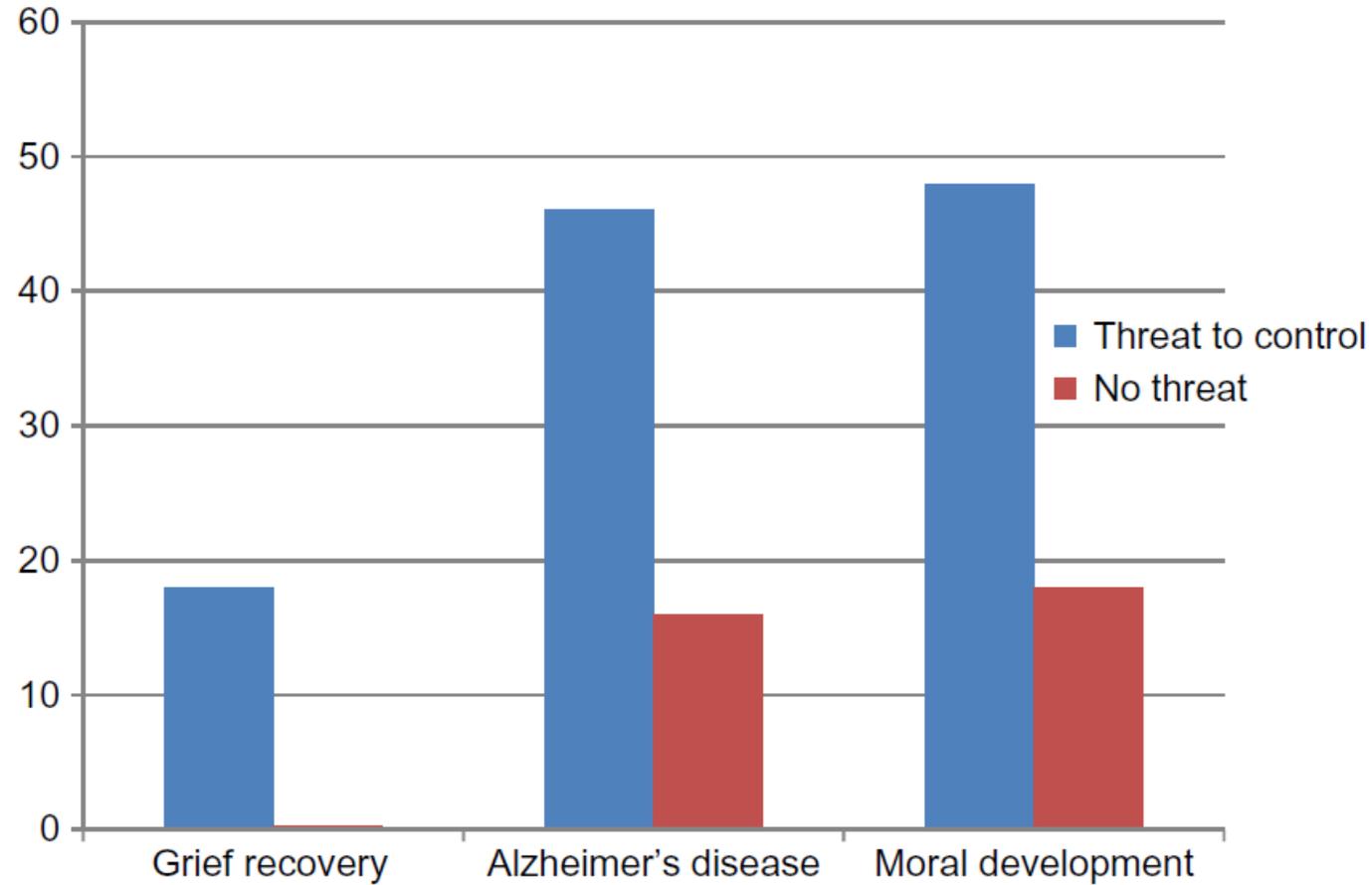
- People oppose scientific endeavors because these oppose their values
  - Purity and naturalness: GMO
  - Moral offensiveness of findings decreases credibility: Cherry-picking of results
- The morality of science itself
  - Paradox: scientists are among the most respected occupations yet a portion of the public distrusts science
  - Scientists are seen to be less concerned with **binding** (ingroup loyalty, authority, and purity) than **individualizing** (fairness and care) moral foundations

# The determinants of attitudes towards science

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## Motivational factors

- Epistemic motives: order and control
  - People want learn about the world and be able to predict future outcomes
- Existential motives: meaning
  - People need to see the world and one's place in it as having purpose and significance
- These needs are not necessarily exclusive and they may lead people to turn away from science but also to believe in science
- **Epistemic motives:** Experimental manipulation of control
  - To recall and describe in detail a situation in which the person had no control
  - Intelligent design, **Darwinian theory**, a predictable evolution process



**Fig. 1** Percentage of participants preferring stage theories of grief recovery, dementia, and moral development over continuum theories of the same processes (Rutjens, van Harreveld, van der Pligt, Kreemers, et al., 2013).

# The determinants of attitudes towards science

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## **Ideological factors**

- Religious beliefs and political ideology (conservatism)
- Research show that political or religious beliefs are not enough to predict science rejection (Hornsey et al, 2016; Lewandowsky et al, 2013, 2016)
- It all depends on the topic (Rutjens et al. 2017)
  - More skepticism about climate change among conservatives
  - More skepticism about vaccination among religious
  - No impact of ideology or religion for GMO attitudes
- In general, religious orthodoxy is a negative predictor of faith in science

# The underpinnings of conspiracy beliefs

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## **Science is a social enterprise (Merton, 1973)**

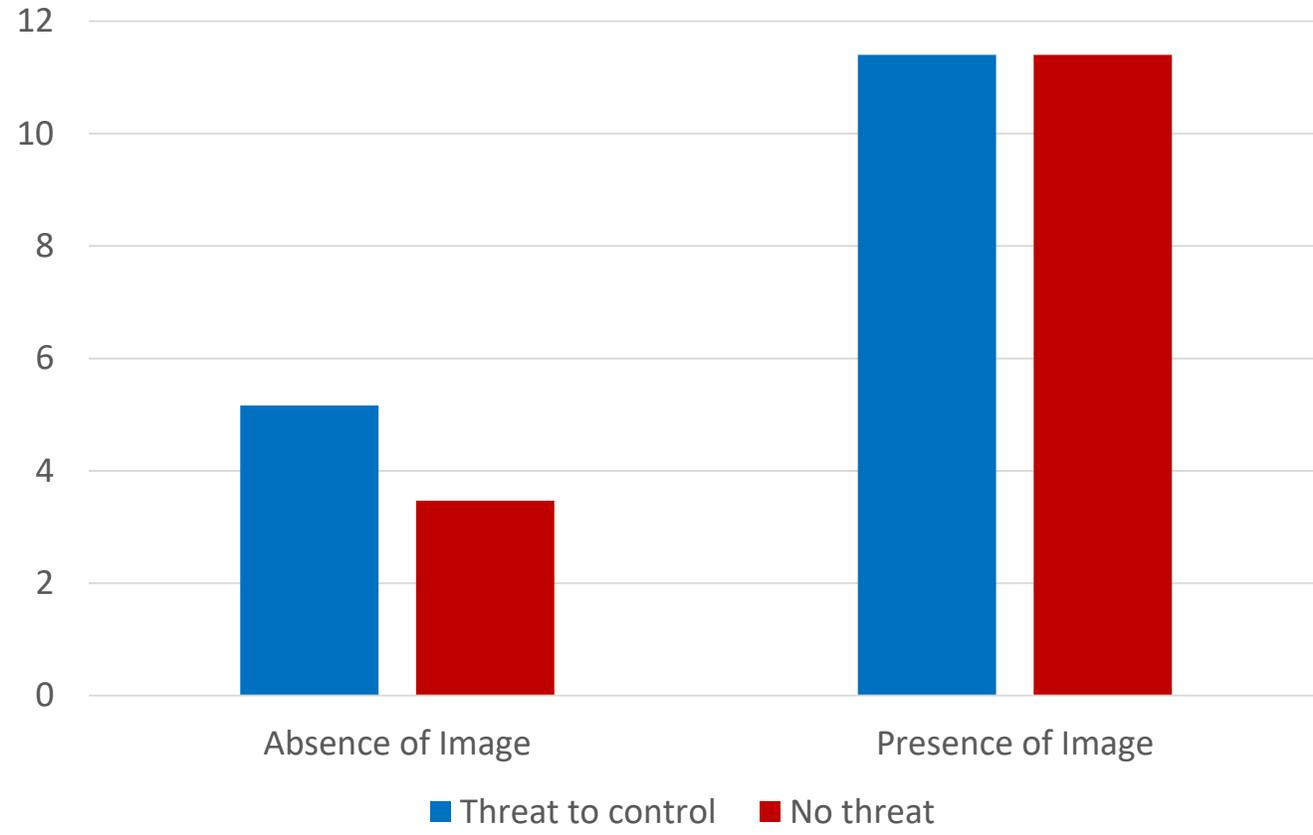
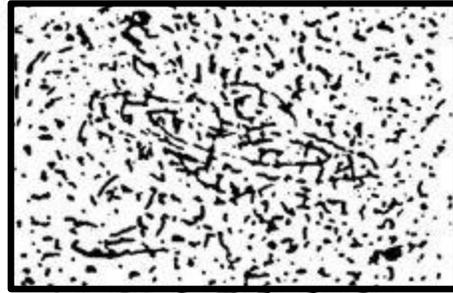
- Disinterestedness, communalism, organized skepticism, universalism
- When norms appear violated (universalism with male & liberal bias ), then public lowers acceptance of science
- Scientists are also perceived to be at the center of conspiracy theories colluding with each other in order to distort, conceal and falsify their results
- Conspiracy theories also serve social needs (underdogs and left-out)

# The underpinnings of conspiracy beliefs

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## **Bounded rationality**

- Not a pathological but a **normal** mode of thinking
  - Conjunction fallacy, intentionality, typicality of causes: all make them better explanations
- People are not cartesians but they are spinozians
  - Withholding judgment is not what people do. Rather, they take sides.
  - Once an option is being adopted, then **confirmation biases** enter the picture
    - Even the **clear absence** of relation is neglected when a theory exists (Rhedelmeier & Tversky, 1996)
    - Even the **clear negation** of evidence fails to influence once a theory has been created (risk versus caution and success in firefighters) (Anderson et al., 1980)



Whitson & Galinsky, 2008

# The social psychological determinants of opinion

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People who 'oppose' are more motivated and more active to disseminate

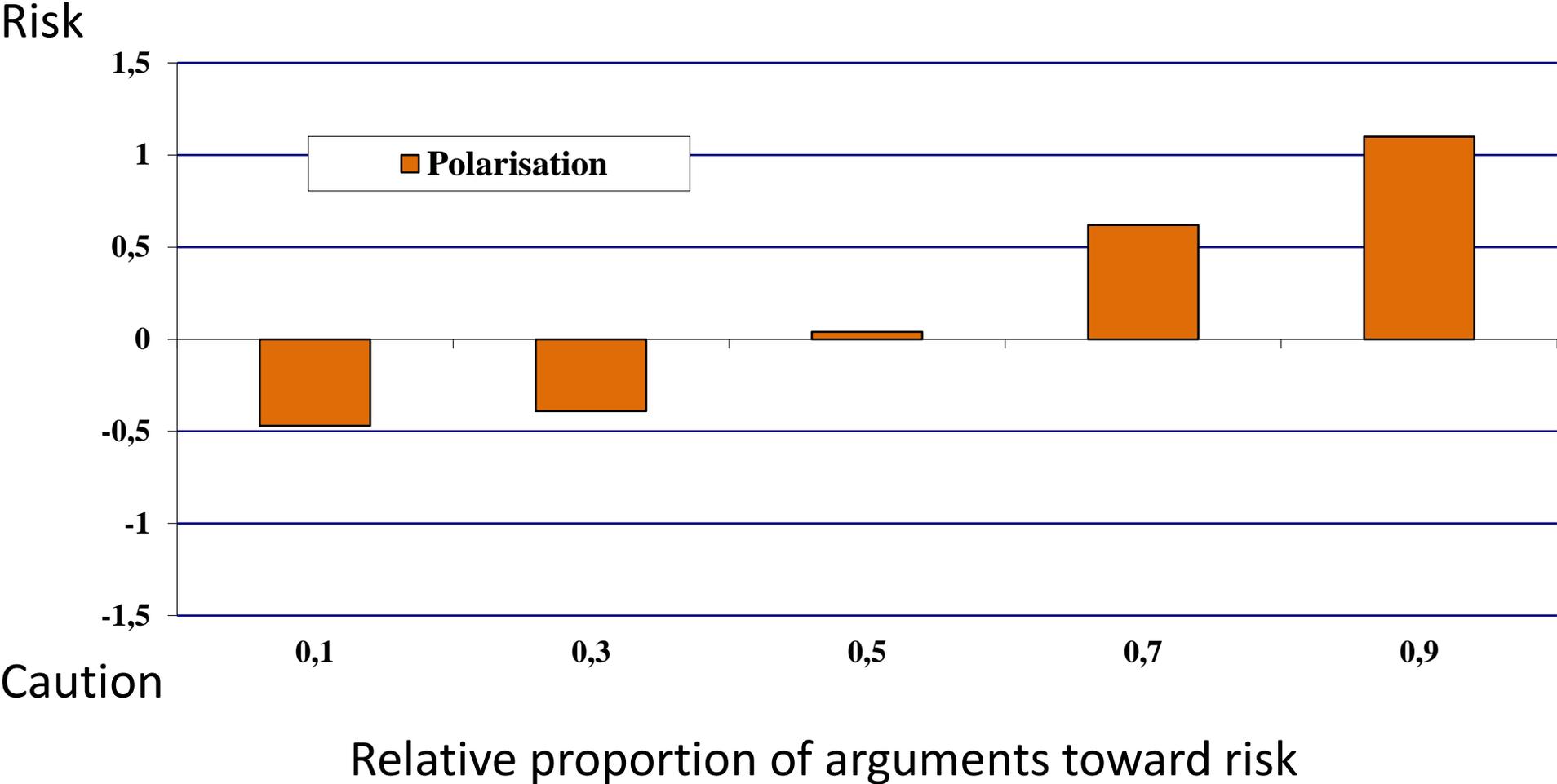
- In a site called Digg.com, 900 000 followers, 30 people generate a third of the articles on the home page
- The browsers do not correct for the imbalance in the supply of arguments in the Pagerank algorithm
  - For a selection of 5 largely non-scientific topics (astrology, crop circles, Monster of the Loch Ness, psychokinesis, aspartam)
  - Content of the 30 first sites proposed by Google
  - 82.5 % are in favor of the non-scientific position

Social media community are largely immune to alternative views: the gap is growing

- Self-selection of exposure

Research on **group polarization** shows a strong impact of both the pool of arguments and the self-selection of discussion participants

# Polarisation as a function of proportion of arguments (Ebbesen & Bower, 1974)



# Conclusions

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## **Rejection of science is fueled by a mixture of concerns**

- If the evidence goes against people's views of right and wrong
- If the evidence threatens a psychological need
- If the evidence contradicts people's ideological and religious views

## **The psychological mechanisms at work are not those of pathological people**

- Much is the consequence of our bounded rationality
- Our fundamentally 'spinozian' mind
- confirmation bias

## **The combination of our minds and the nature of the cognitive market: social media and distrust**

- People who 'oppose' some truth are more motivated and more active
- The browsers do not correct for the imbalance in the supply of arguments
- The social media community are immune to alternative views: the gap is growing

The logo of the University of Louvain (UCL) is located in the top right corner. It consists of the letters 'UCL' in a bold, white, sans-serif font, centered within an orange square. Below 'UCL', the words 'Université catholique de Louvain' are written in a smaller, white, sans-serif font, also centered. The entire logo is set against a white background.

UCL

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# Thank you

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