

# MAN MADE BLACK HOLES AND BIG BANGS: INTEGRATION OF SCIENCE INFORMATION INTO EVERYDAY THINKING

Nelly Courvoisier, Alain Clémence & Eva Green - University of Lausanne



LHC

## HYPOTHESES

### Social Representations Theory & thinking systems

Objectification (focalization on core and strange aspects of information) and anchoring (integration in prior beliefs, experiences etc.) processes occur during transfer of information between informative thinking (e.g science) to representative thinking (common sense)

**Objectification.** Diffusion: persistence of the controversial term "black hole". Orientation of focalization: increase of the term "black hole" in controversial condition, increase of other expert terms in descriptive condition.

**Anchoring.** Positive attitudes towards science (trust in science and scientists) and CERN predict use of more scientific terms from the initial message, controlling for prior knowledge about science and understanding.

THEORY

### Social Representations Theory & science communication:

Green & Clémence (2008): 3 studies on the transformation of information concerning the discovery of a potential faithfulness gene, through diffusion in communication chains:

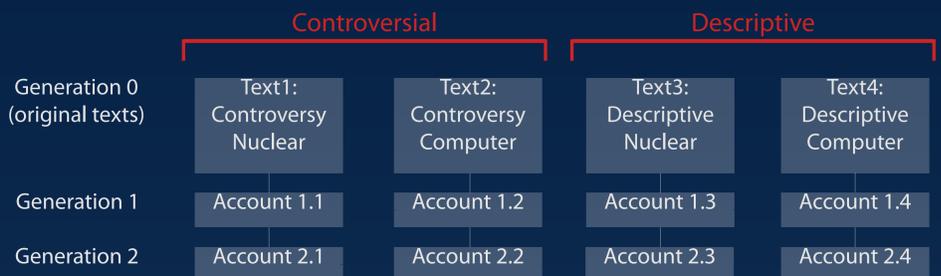
- Results:
1. Objectification: Focalization on strange or striking elements of the message.
  2. Anchoring: Effect of beliefs about genetics on transformation of information (i.e change in vocabulary to suit better everyday communication).

### 1. Adapted Serial Reproduction Design

Each generation 1 (G1) participant summarized one of the four original texts. Generation 2 (G2) participants summarized one of G1 written accounts. Initial texts evoked creation of potential **black holes** in the LHC (controversy), vs historical description of the construction of LHC (descriptive). Additional parts evoked nuclear vs computer science improvements thanks to the LHC.

### CERN and the Large Hadron Collider

- CERN = European Organization for Nuclear Research, near Geneva
- LHC = particle accelerator: 27km long, buried 100m underground, accelerates particle close to light speed, creating "mini big bangs"
- Controversy about the LHC, widely debated in newspapers around the world: fear that it could create **black holes** and destroy the Earth!



## METHOD

### 2. Variables

Independents:

**Trust** (N = 73) vs **Mistrust** (N = 107) towards science and scientists  
**Pro** (N = 116) vs **Anti-CERN** (N = 48)

Controls:

Prior knowledge, understanding, perceived difficulty, education

Dependents:

Terminology in the accounts: "black hole" vs other expert terms

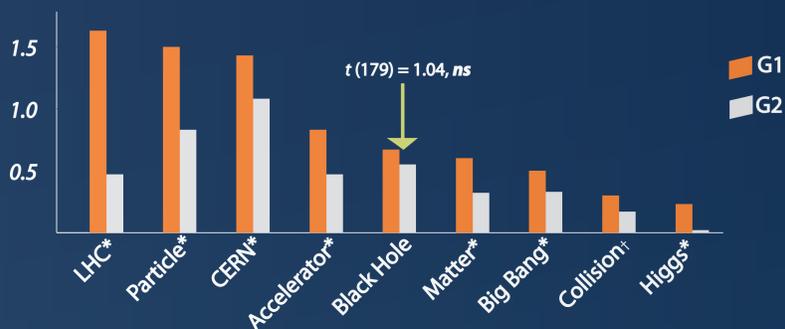
### 3. Participants

- Total N = 181 (N<sub>G1</sub> = 121, N<sub>G2</sub> = 60)
- 61.9% Female
- 79% from University
- 72.5% Native French speakers
- 92.8% already knew CERN

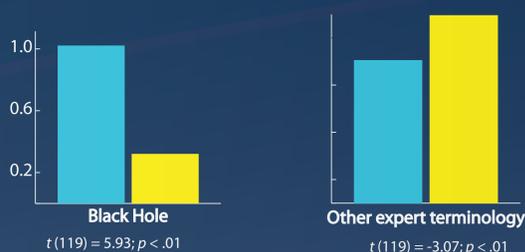


## RESULTS

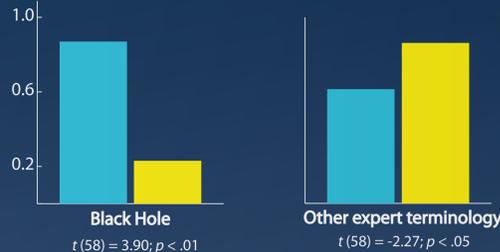
### 1. Objectification



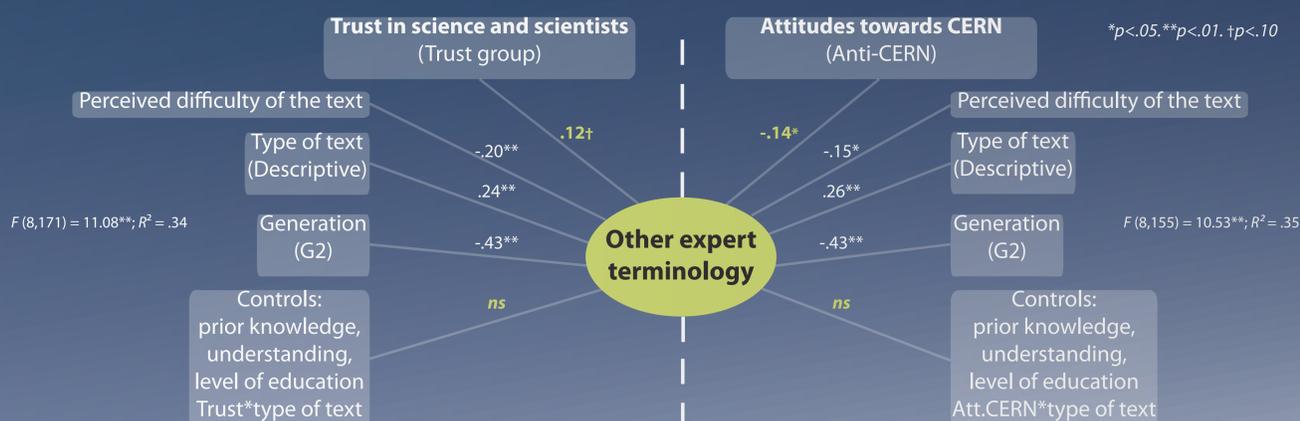
G1



G2



### 2. Anchoring



Overall hypotheses are confirmed: the **black hole** controversy persists through generations and is function of initial message. Participants with more positive attitudes compensate the focalization on the controversy by using more other expert terminology in their accounts.

This study:

- Adds evidence for the importance of objectification and anchoring in the sense making of information, underscoring the relevance of SRT in the study of diffusion of ideas.

- Helps transferring the question of public understanding of science from a cognitive problem to a dynamic social and cognitive phenomenon.

CONCLUSION