

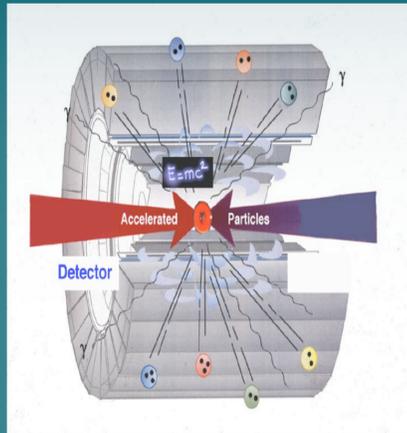
# Talking about particle physics: Transmission and transformation of scientific information among visitors of ATLAS

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## Science Communication

### Social Representational Perspective

• While the Deficit Model proposes a linear process in which genuine scientific knowledge is “distorted” when diffused by media and the general public (Bucchi, 2004), SRT is interested in the processes by which scientific information is “integrated” by lay people into everyday thinking (Bauer & Gaskell, 1999; Moscovici, 1976). SRT studies sensemaking of new scientific information and argues that transformation is a necessary reconstruction to fulfil a social function (Wagner, 1994). In this approach, scientific information is transformed into concrete elements by **objectification** (simplification and focalization on some aspects of the message) and have to be **anchored** in prior beliefs, knowledge, attitudes, group membership etc. to acquire social significance (Clémence, 2001; Clémence & Green, 2006; Green & Clémence, 2008; Purkhardt, 1993, Moscovici, 1976).



### The ATLAS experiment

• The ATLAS experiment aims at finding elementary particles that should explain the existence of matter, so of the Universe. In this purpose, the Large Hadron Collider (LHC) accelerates protons close to light speed. Particles are created by colliding the protons in the centre of the ATLAS detector, and are the object of CERN physicists' studies. When visiting the ATLAS detector and the LHC, visitors are explained the goals of the ATLAS experiment.

### Hypotheses

• Impacting of **pre-existing attitudes and beliefs** on the information transformation (number of expert words, inference task).

## Method

### Procedure



### Participants

Total: N=137

- Language of the visit: **French** (N=78; 54 men, 20 women, 4 unknown) or **English** (N=59; 45 man, 14 women).
- Majority of **university-level** of education: 59.6% within English, 72.6% within French tour groups ( $X^2(1)=1.54$ ; ns).
- **Prior information** about CERN
  - Previous CERN visit: 55.9% within English, 17.9% within French tour groups ( $X^2(1)=4.05$ ;  $p<.01$ ).
  - Look for information: 39% within English, 23.1% within French tour groups ( $X^2(1)=21.50$ ;  $p<.01$ ).



### Variables

- Independants: **attitudes** and **beliefs** towards science (Clémence & Green, 2006; Green & Clémence, 2008; Evans & Durant, 1995), prior objective knowledge (control).
- Dependants: number of **expert terms** from written accounts (“explain the goals of the ATLAS experiment”), **inference** task (recognize words pertaining to the ATLAS experiment)

## Main results

	Expert terms		Inference	
	r	$\beta^1$	r	$\beta^2$
<b>Knowledge</b>	.12	-.02	<b>.39**</b>	.14
<b>Attitudes</b>				
Science in general	<b>.29**</b>	<b>.22*</b>	<b>.19*</b>	.14
Science should replace religious beliefs	<b>-.22*</b>	<b>-.19*</b>	<b>-.28**</b>	<b>-.23**</b>
<b>Prior information about ATLAS</b>	.11	.13	.14	<b>.16*</b>
<b>Sex</b>	-.06	-.01	<b>-.30**</b>	<b>-.17*</b>
<b>Education</b>	<b>.27**</b>	<b>.20*</b>	<b>.31**</b>	<b>.19*</b>
<b>Visit language</b>	.13	.04	<b>-.19**</b>	<b>-.22**</b>

• **Attitudes and education are key predictors of the expert terms**, but not prior knowledge. A more positive attitude towards science, higher level of education and disagreement with the proposition that science should replace religious beliefs predict more expert terms in the summaries.

• For the **inference** task, we find the same pattern concerning education and the relative position of science and religion. We find also that men, more information about ATLAS and the English tour group performed better to this question.



The Large Hadron Collider

## Conclusion

• Our participants are “scientific amateurs”, and as such have a general positive attitude towards science. Nevertheless our study replicates results from past experimental studies (Clémence & Green, 2006; Green & Clémence, 2008) carried out with lay persons, showing the **impact of attitudes, beliefs** and the lower importance of prior knowledge, even if we find effects of the level of education.

• We can conclude that these results are **in favor of a SRT model** vs the Deficit Model to account for the diffusion of scientific knowledge.

<sup>1</sup>  $R^2 = 18.9$ ,  $F(7,124) = 3.89$ ,  $p < .01$ ; <sup>2</sup>  $R^2 = 34.1$ ,  $F(7,124) = 3.89$ ,  $p < .01$

