Sustainable environments for CO2 storage communication and understanding

Samuela Vercelli
CO2GeoNet – University of Rome “La Sapienza” CERI

Learning about CO2 Storage

When we started studying to find an optimal way to disseminate scientific research CO2 storage, our focus was mainly on content: what to say, which terms to use, how to make it understandable, etc.

What we came to experience though, brought us towards a different focus...

A primary school study

- How to help children learn about CO2 Storage?
- Careful selection and preparation of contents
- A playful approach: we learn best when we enjoy ourselves
- A scientific attitude: freedom to make mistakes

A primary school study
The Demand Analysis Approach

- What would be the psychosocial challenges related to the introduction of a new technology such as CCS?

- Survey of representations (drawings)
- Careful consideration of the relationships (between ourselves, the children and the teachers, between the children and the teachers, among the children themselves…)

The drawings

- 650 drawings produced at three different stages of the study (before starting, end year one, end year two)

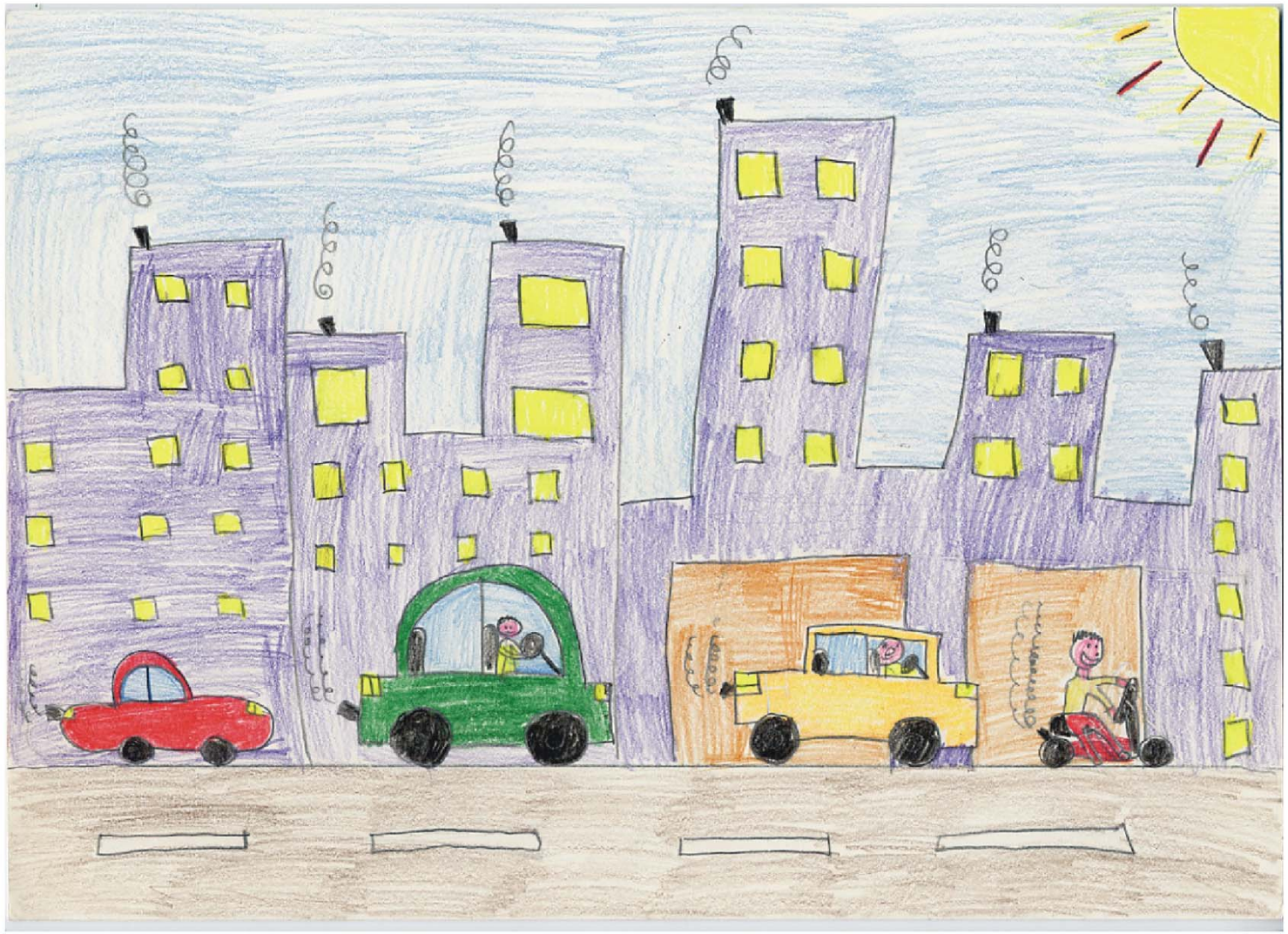
- The assignment was to make a drawing on energy and pollution

Drawings codification

- **Motivation needs** (after McClelland):
  - **Affiliation**: establishing, maintaning or restoring a positive affective relationship with another person(s)
  - **Power**: controlling and influencing other people's behaviour or the environment
  - **Achievement**: searching for solutions to individual or social problems

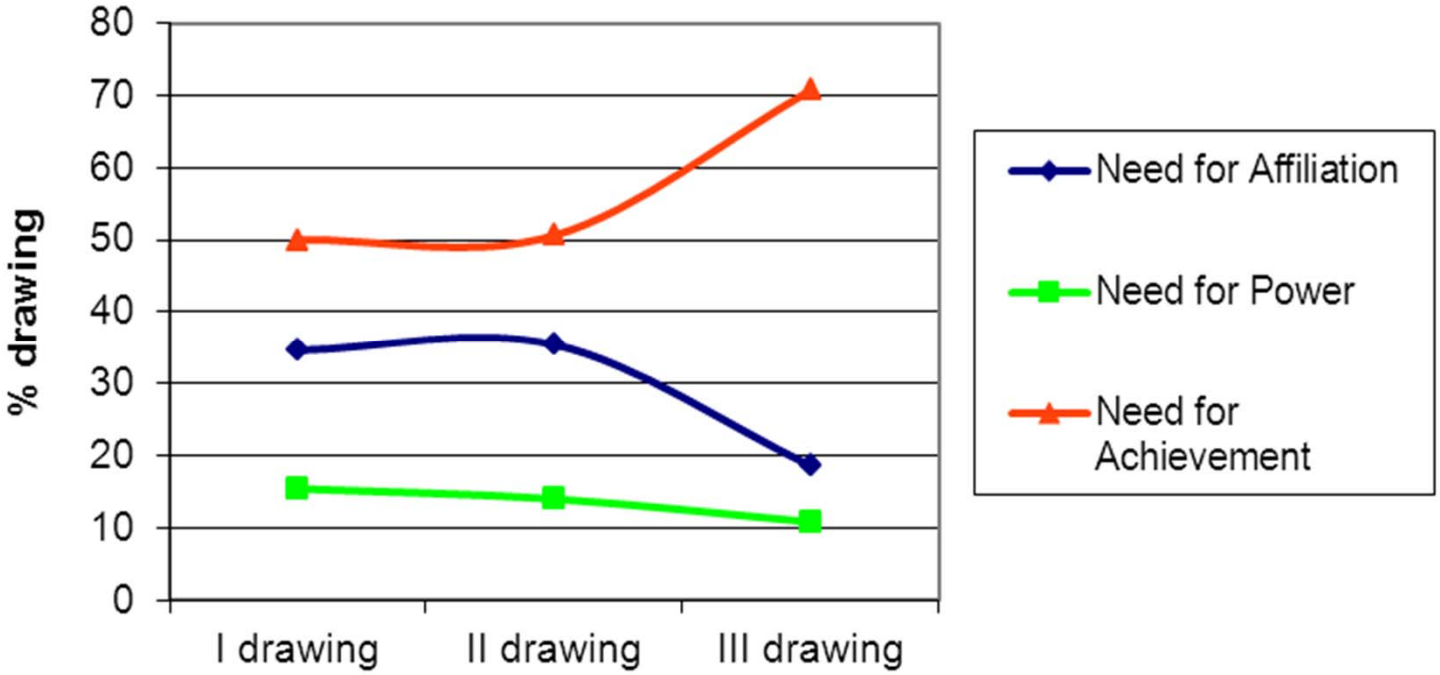
Drawings codification

- **Relationship to pollution:**
  - Acting
  - Witnessing
  - Blaming
  - Being subjected to
  - Being constructive
  - Other



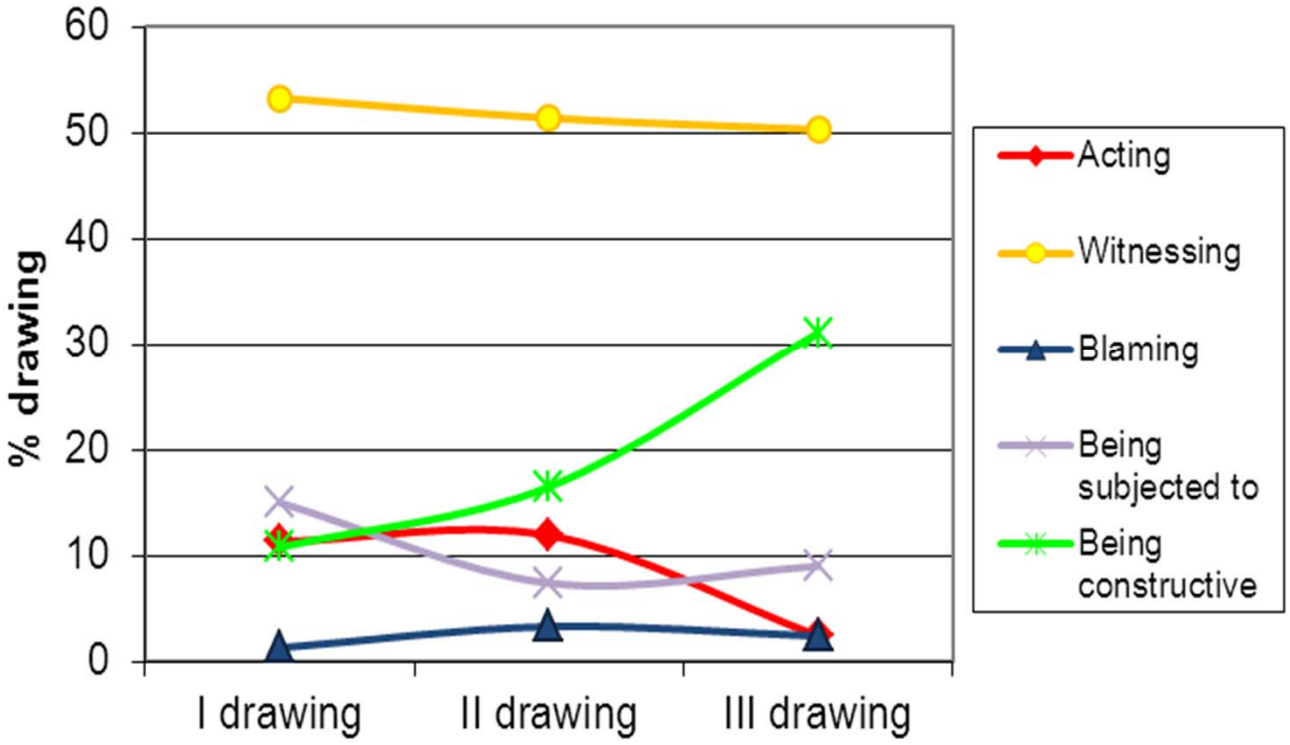
I drew polluted Rome. Air pollution (Affiliation/Witnessing)

Results fig.1



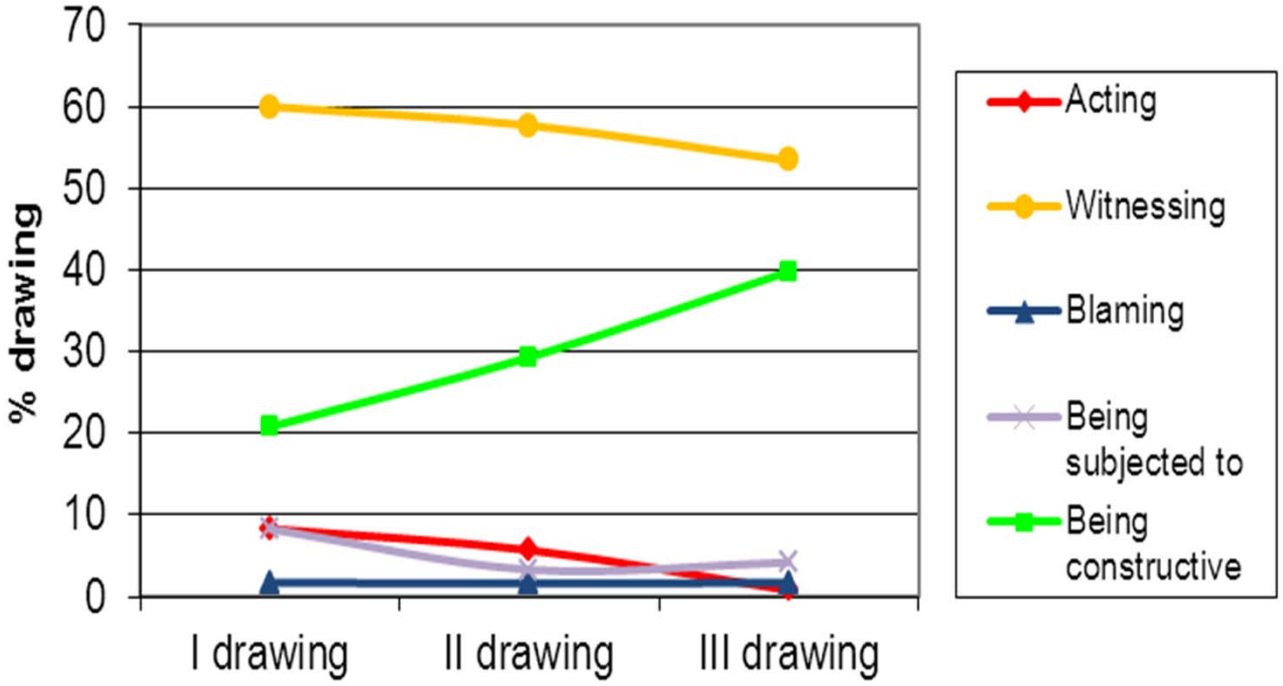
Motivation needs: evolution over time

Results fig.2



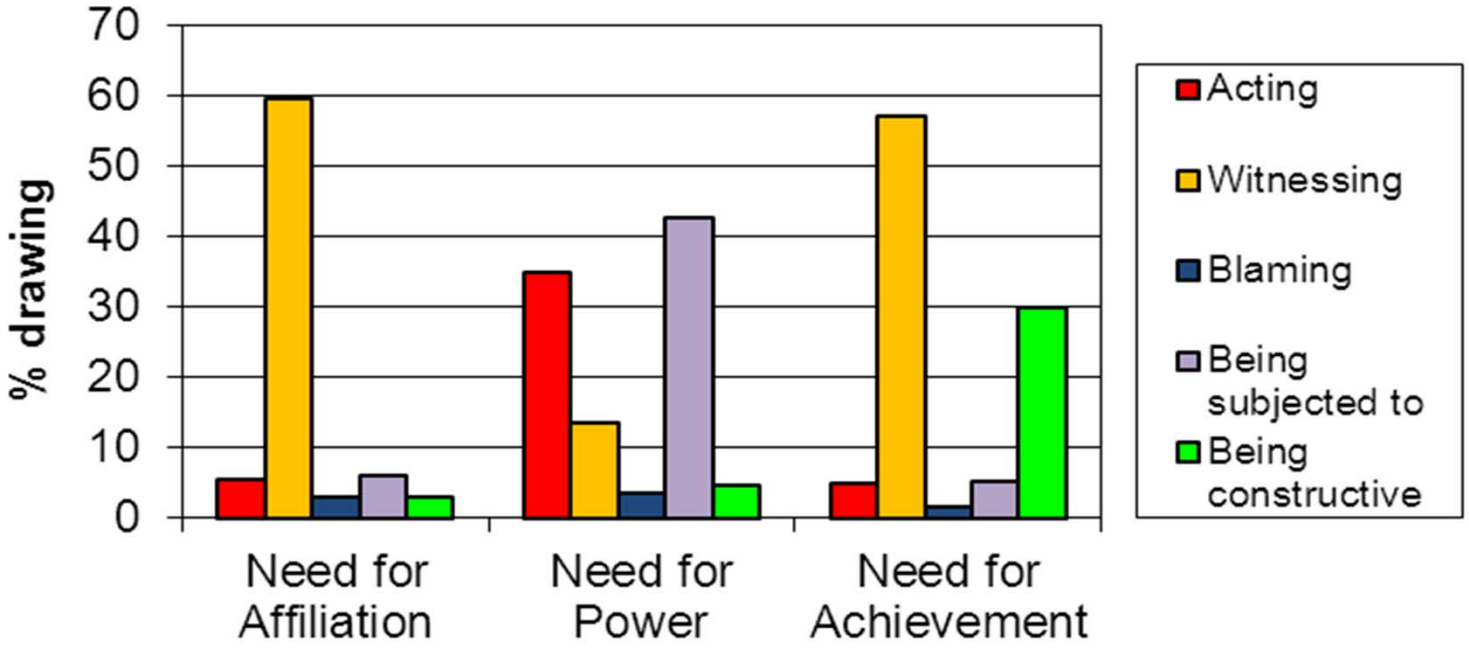
Relationship to pollution over time

Results fig.3

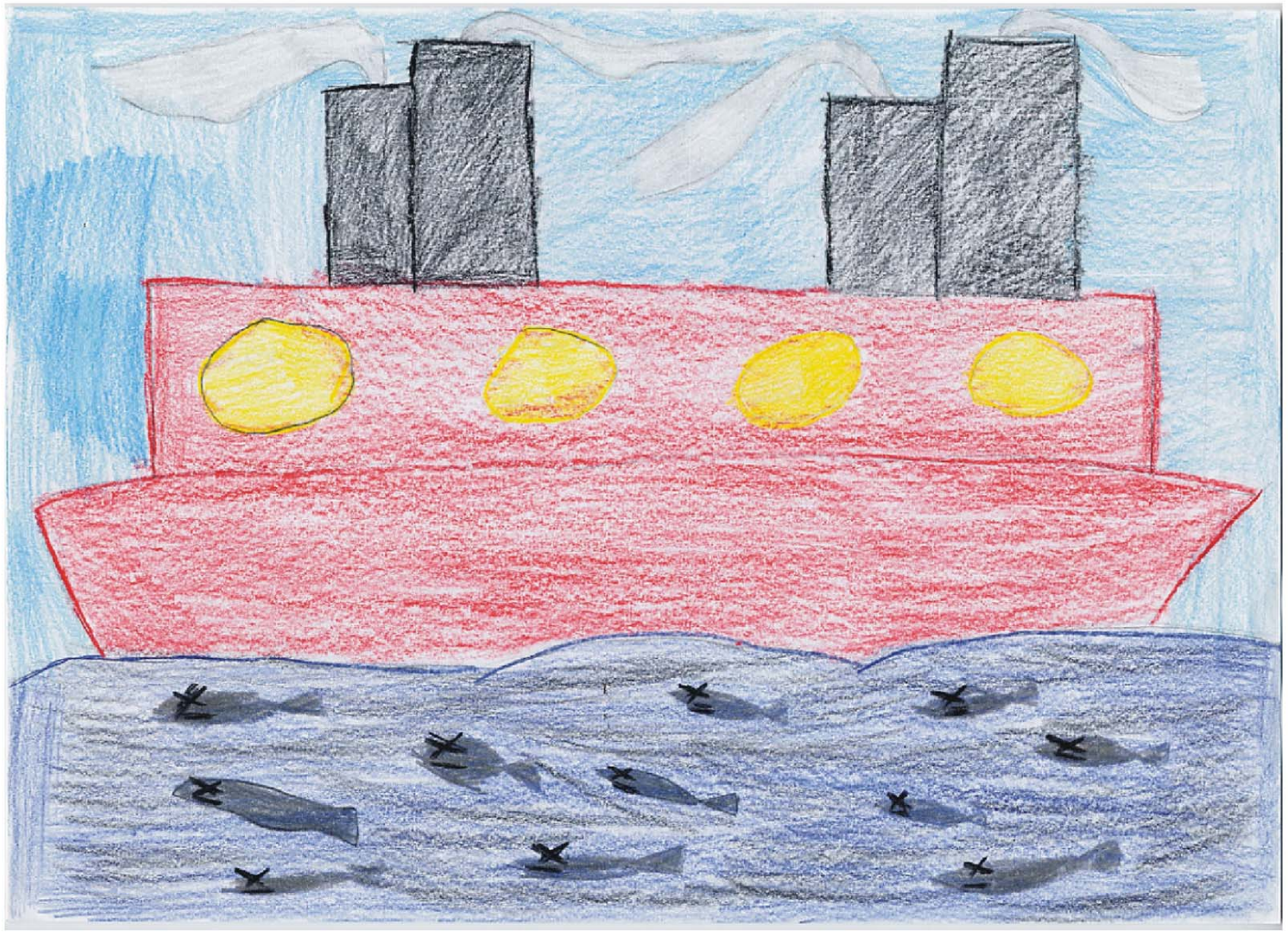


Need for achievement/Relationship to pollution over time

Results fig.4

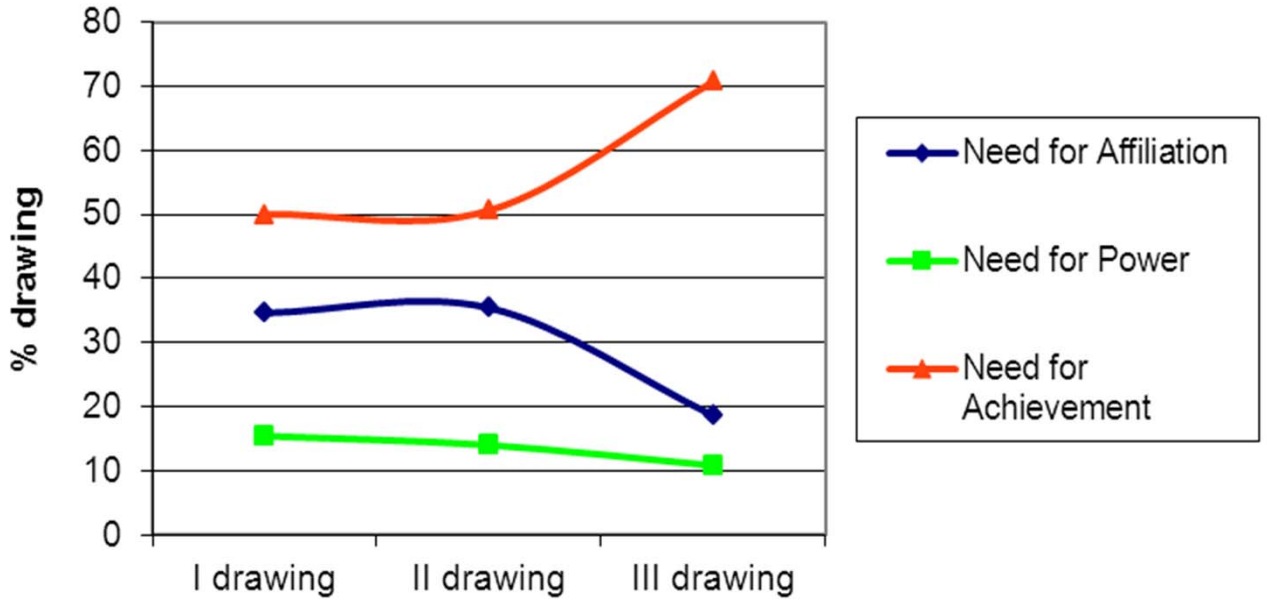


Motivation Needs/Relationship to pollution (totals)

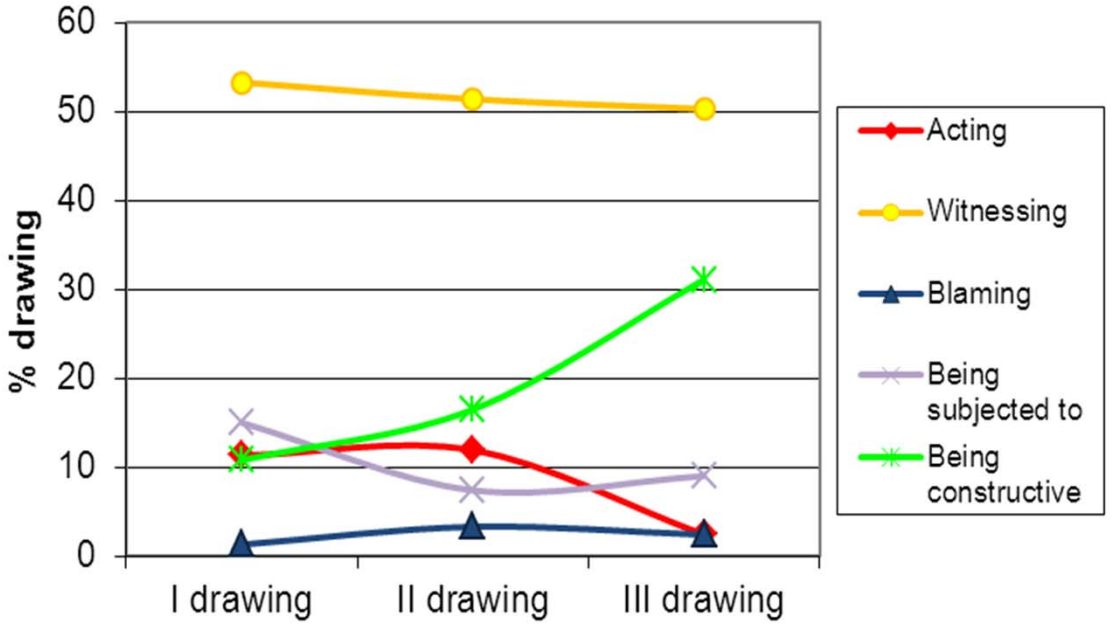


I drew an oil tanker that pollutes the sea
and makes fish die (Power/Being Sub. to)

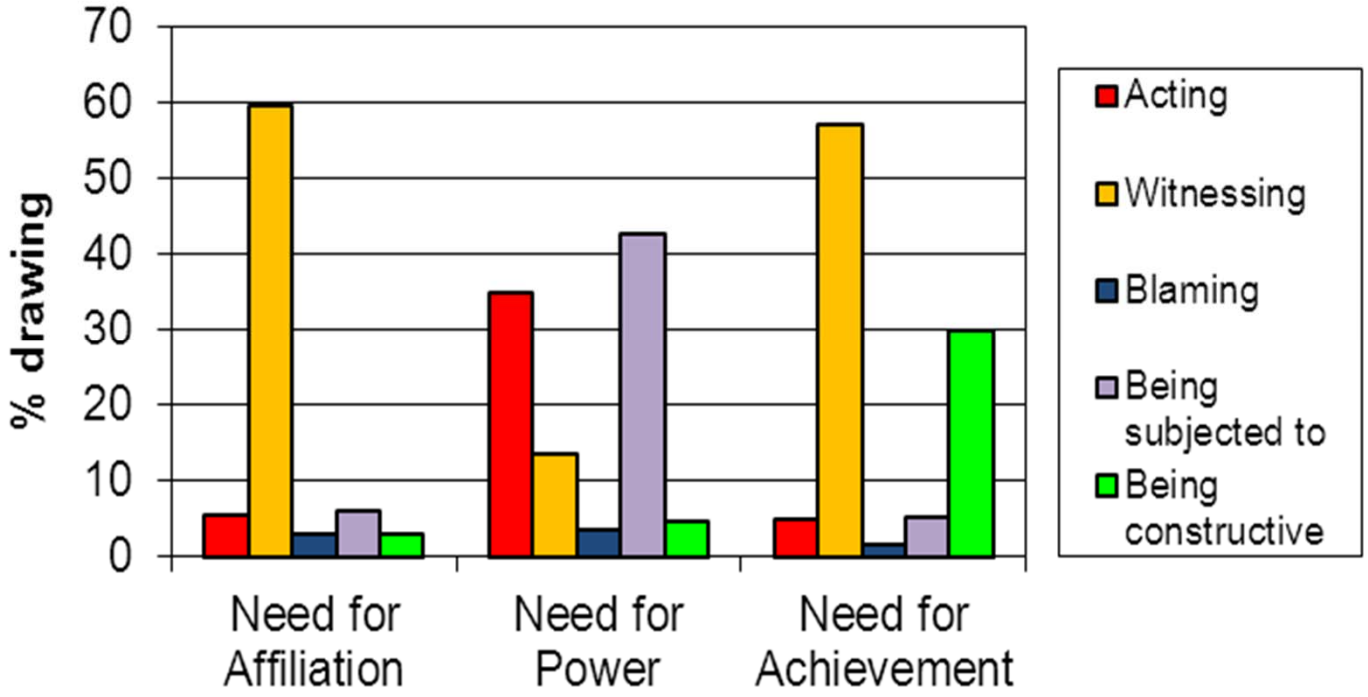
The topic of energy and pollution generates Achievement motivation in the majority of the children, that is, it is seen in terms of a problem to which a solution needs to be found

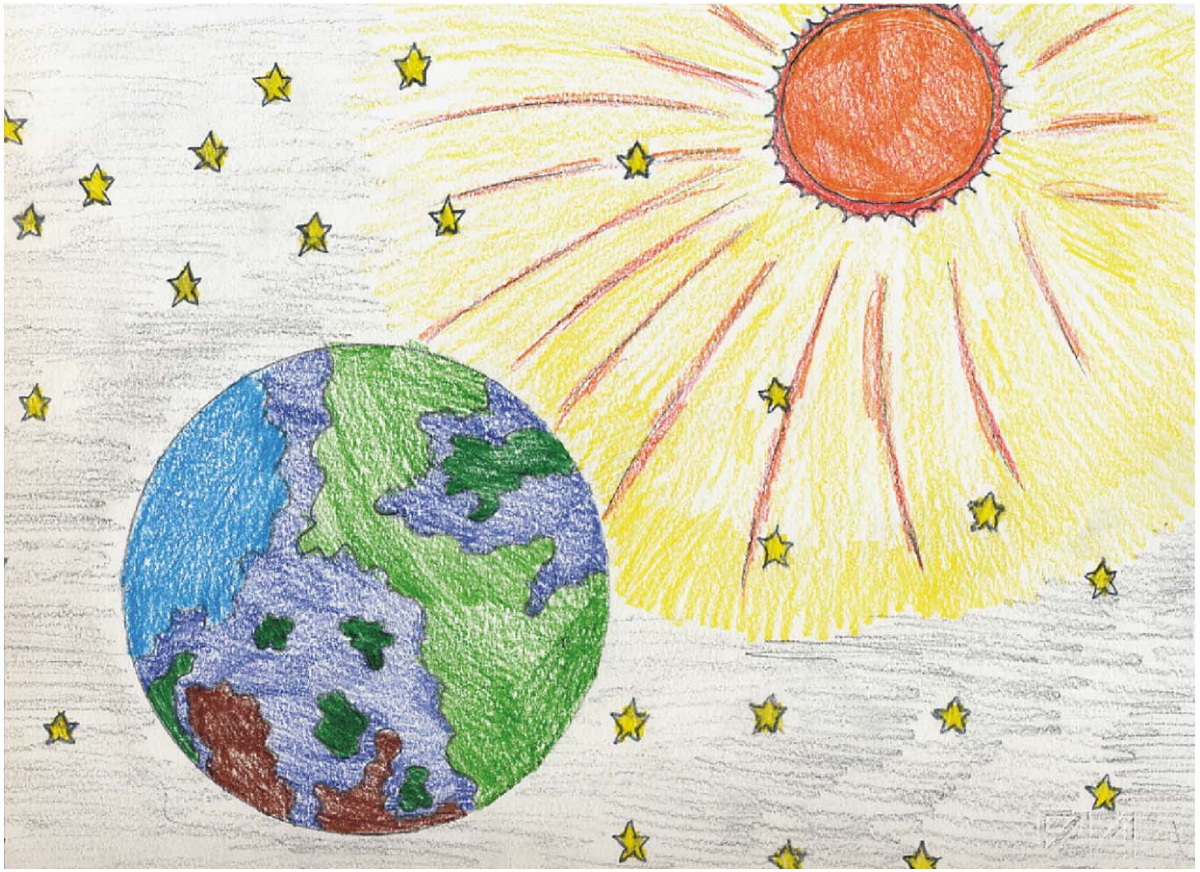


But when we look at the way the children relate to the problem, then we can see that the majority of them cannot envisage a positive and active behaviour towards the solution. Only a minority of the children can think and feel that something can be done; this group increases over time and actually triples by the end of the study

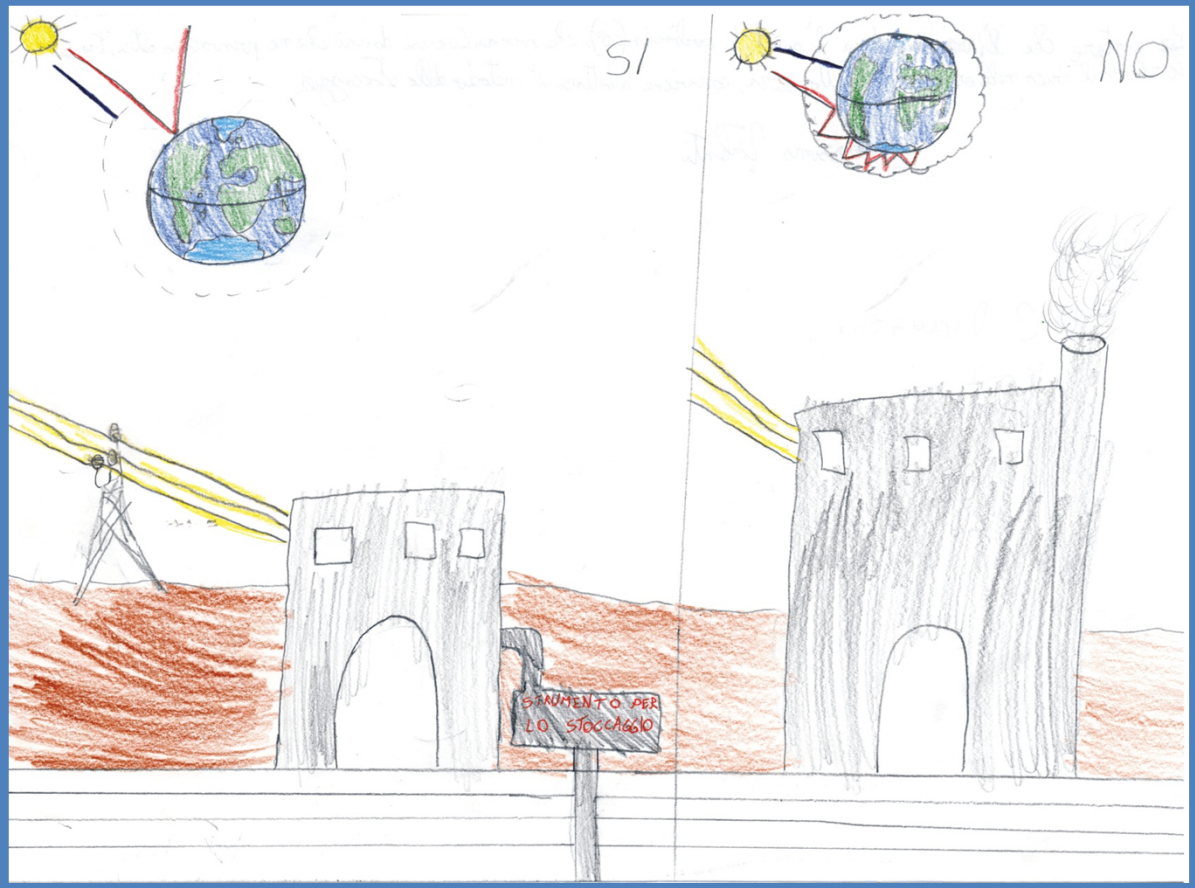


There is a big gap between the presence of the Achievement motive and the possibility to establish a constructive relationship with the issue





I drew the greenhouse effect: the sun illuminates and warms the earth with its rays. Carbon dioxide is represented in grey and lots of stars. The sun's rays go into the earth but can't get out and so the greenhouse effect is created (Achievement/Witnessing)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Where is a being constructive attitude to be found?

- It is overwhelmingly linked to the Achievement motive

	Need for Affiliation	Need for Power	Need for Achievement
Being constructive	5,1%	3,4%	91,5%

To increase the presence of a constructive attitude it will be fundamental to support the development of the Achievement motivation

A psychosocial challenge

- children representations point to what, in general terms, could be described as “relative awareness of the problem, but not feeling actively involved or interested, and no idea on how to tackle it”
- The challenge is to:
- increase Achievement motivation
- Increase constructive attitude
- Reduce the gap between them

The problem and a possible solution

- High Achievement motivation/Low being constructive attitude
- Experience in the classroom: High willingness to collaborate/Limitations to collaborative approaches-don't know how to

- Creating a **"trusting environment"** improved and increased both the Achievement motivation and the constructive attitude

How to

- Give attention to subjectivity
- Make room for working together
- Establish an equal relationship
- Establish a context where you can look together at the problem and look together for solutions

- To get the info through we had to create a **free-zone** where exchange could take place outside of conventional school schemes (evaluation, rigid unidirectional roles, right answers, etc.)

- The **experience** of what we have called a “trusting environment” seems to have positively influenced the children’s attitude: they relate to the issue more creatively, thinking more frequently about possible solutions, they drop active polluting attitudes

Research questions

- The need of identifying appropriate contexts and conditions for exchange and discussion(lack of time and appropriate situations for sharing)
- The need of exploring **new settings** for learning and working that increase the possibilities for people to explore and discover their potential, to submit their contribution at all levels, towards solving energy issues

Conclusions

- To develop a more sustainable energy system we need **MORE SUSTAINABLE HUMAN ENVIRONMENTS**:
- Environments where children feel at ease and can interact freely, make mistakes, feel confident of their ability to accomplish
- Contexts within which children can develop their **Achievement motivation**, feel authentic interest for scientific and technological information and its use and **express their constructive attitude**

Thank you!

- For information you can contact me: samuelavercelli@uniroma1.it
- You can download the article and print it at:
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