Assessing the role of a priori user knowledge in climate services perception: An experiment with university students across Europe

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Introduction

Climate Service Production Chain
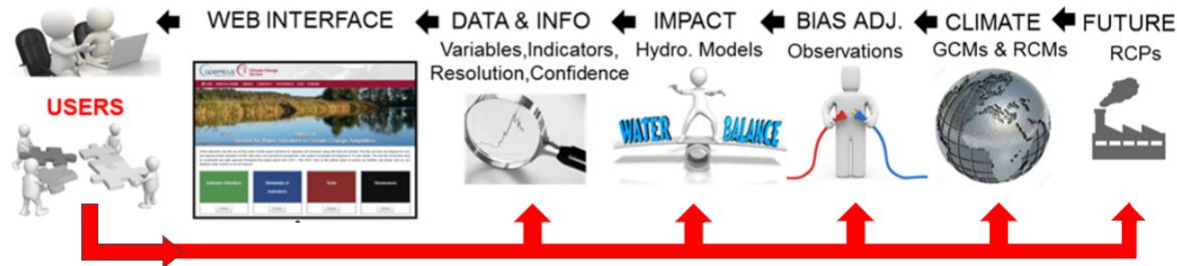

- CS users are the crucial agent in the CS production chain

- User role needs to go further than only making use of the CS

- A priori user knowledge (i.e. their background, expectations of CS, previous experiences with CS) can condition user role in this co-development process, but usually not considered in techniques to collect users feedbacks.

- **This work tries to assess the role of user previous knowledge and the perception that users have about Climate Service**

STUDENTS'
EXPERIMENT

Student's Experiment Structure
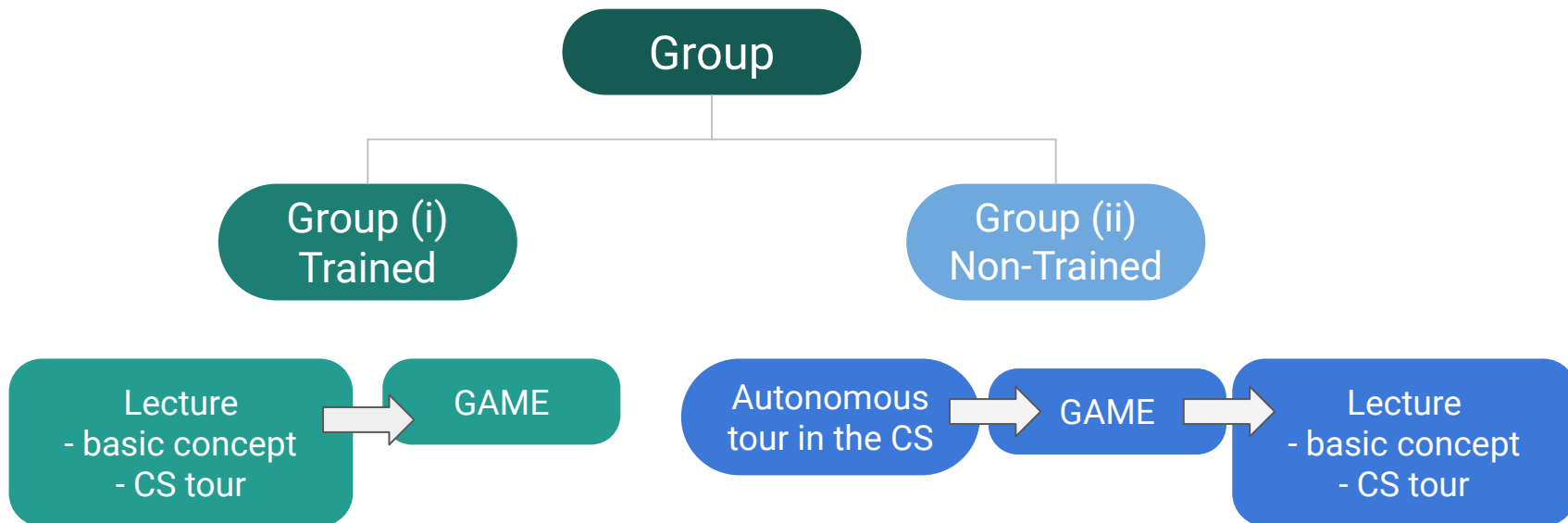
Game

Initial Knowledge:
Basic definitions in CS

- Climate Service
- Ensemble Mean
- Climate Projection
- Emission Scenario

Role Game with 4 level of information

- Ensemble Mean (L1)
- Ensemble Spread (L2)
- Ensemble Intensity (L3)
- Ensemble Robustness (L4)

Evaluation of decision made:
- Level of trustiness

Gained Knowledge Assessment: Basic definitions in CS
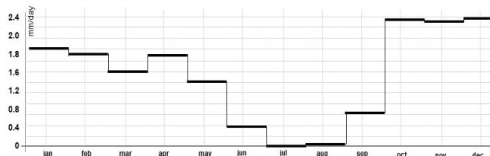

Can you identify precisely...? *
Match definition (row) and concept (columns)

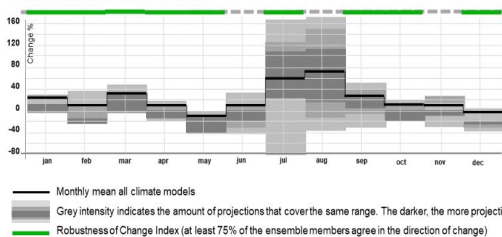|	Climate Service	Emision Scenario	Climate Projection	Ensemble	I don't know
The simulated response of the climate system to a scenario of future emission or concentration of greenhouse gases	☐	☐	☐	☐	☐
A plausible representation of the future development of emissions of substances that are potentially radiatively active based on a coherent and internally consistent set of assumptions about driving forces and their key relationships.	☐	☐	☐	☐	☐
A collection of					

The O lake is an endorheic lake, mainly fed by precipitation. Its water is used for supplying two populations. Moreover, the lake is a touristic area where leisure activities related to water has been growing since 1970 (i.e. river kayaking, canoeing). A new management plan for the lake is going to be designed during the next years and the managers want this plan to be valid at least until mid-century. **You have been hired as expert by the water organism to help them in deciding whether to increase the leisure activities in the lake (i.e. building a nautical club and a recreation area) or not**. So far, the water supply to the populations has suffered restrictions only twice since 1960.
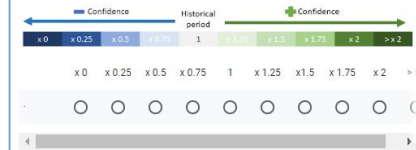

Precipitation
A) Absolute Values (1960-2000)

B) Climate Change Impact (2020-2050) – RCP8.5

— Monthly mean all climate models
▓ Grey intensity indicates the amount of projections that cover the same range. The darker, the more projections
— Robustness of Change Index (at least 75% of the ensemble members agree in the direction of change)

Which decision would you make?
- ○ I would recomend increasing the water related leisure activities
- ○ I would not recomend increasing the water related leisure activities

How much would you trust the information in the future assuming that your level of confidence is 1 for the historical data (1960-2000)? *

| Confidence | Historical period | Confidence |
| x 0 | x 0.25 | x 0.5 | x 0.75 | 1 | x 1.25 | x 1.5 | x 1.75 | x 2 | > x 2 |

x 0   x 0.25   x 0.5   x 0.75   1   x 1.25   x 1.5   x 1.75   x 2   >

○   ○   ○   ○   ○   ○   ○   ○   ○   ○

Preliminary Results

Did the students change their knowledge regarding basic CS definitions after the GAME?

	TRAINED (55)		NON-TRAINED (60)	
	Before	**After**	**Before**	**After**
Climate Projection	20 (36%)	31 (56%)	22 (37%)	22 (37%)
Emission Scenario	25 (45%)	28 (50%)	33 (55%)	30 (50%)
Models ensemble	33 (60%)	38 (70%)	28 (47%)	32 (53%)
Climate Service	37 (67%)	37 (67%)	40 (67%)	41 (68%)

- Trained users improve CS basic knowledge after the activity, the lecture and the guided gaming help for a better understanding.
- Concepts were not clear for stand-alone students, with a general decrease in proportions of right answers after the activity.

Preliminary Results

Did the different levels of information change the student behavior
regarding decision making?

* Level of information provided:
L1: ensemble mean
L2: ensemble mean + spread
L3: ensemble mean + spread + shading
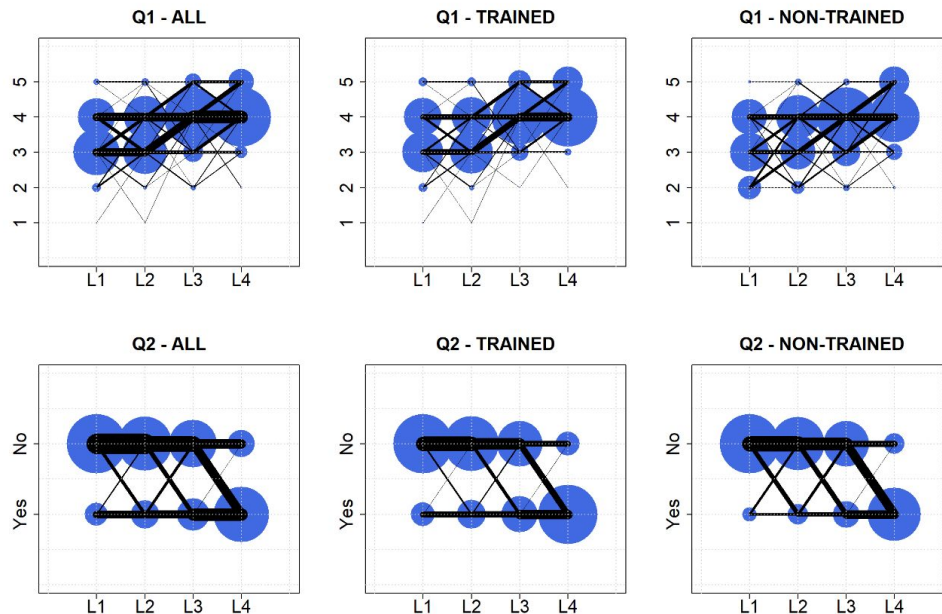L4: ensemble mean + spread + shading + robustness
** Questions
Q1: Do you find this information useful? (1-5)
Q2: Would you base your decision on this information?
(YES or NO)
Q3: Which decision would you make? (YES or NO)
Q4: How much would you trust the information in the
future assuming that your level of confidence is 1 for the
historical data (1960-2000)?(0-2)

- **Q1:** The change was more constant between levels for the trained group (lines size), while the spread was higher in the non-trained ones (similar sizes in all circles)
- **Q2:** Decision changes was similar for both trained and non-trained groups

Preliminary Results

Did the different levels of information change the student behavior regarding making a decision?

Level of information provided:
L1: ensemble mean
L2: ensemble mean + spread
L3: ensemble mean + spread + shading
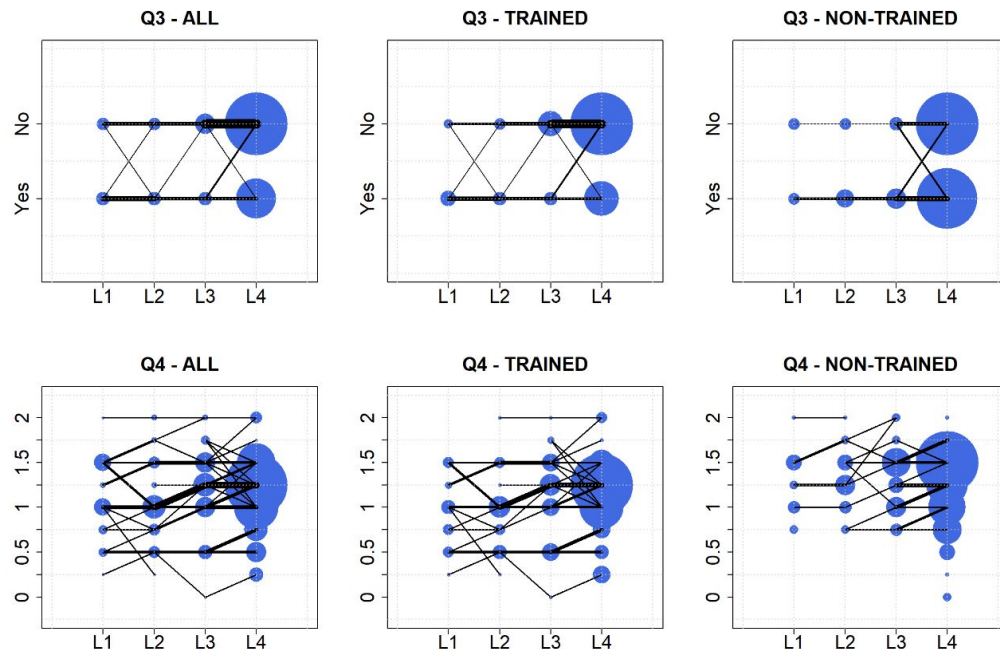L4: ensemble mean + spread + shading + robustness
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Q4: How much would you trust the information in the future assuming that your level of confidence is 1 for the historical data (1960-2000)?(0-2)

- **Q3:** In general decision made does not change during the experiment, the initial decision is kept during the experiment.
- **Q4:** Non-trained group trusts more the information, however, their concepts were less clear.

Thanks

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