Questionnaire

Attitudes towards the use of computer modeling in environmental projects

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1. Cognitive styles

In this section, the respondents had to tick for each item one of the following options: "Strongly disagree", "Disagree", "Neutral", "Agree", "Strongly agree". Items followed by an asterisk were inverted for the analysis.

A. Need for closure (15-items scale, from (Roets & Van Hiel, 2011))

1. I don't like situations that are uncertain.
2. I dislike questions which could be answered in many different ways.
3. I find that a well ordered life with regular hours suits my temperament.
4. I feel uncomfortable when I don't understand the reason why an event occurred in my life.
5. I feel irritated when one person disagrees with what everyone else in a group believes.
6. I don't like to go into a situation without knowing what I can expect from it.
7. When I have made a decision, I feel relieved.
8. When I am confronted with a problem, I'm dying to reach a solution very quickly.
9. I would quickly become impatient and irritated if I would not find a solution to a problem immediately.
10. I don't like to be with people who are capable of unexpected actions.
11. I dislike it when a person's statement could mean many different things.
12. I find that establishing a consistent routine enables me to enjoy life more.
13. I enjoy having a clear and structured mode of life.
14. I do not usually consult many different opinions before forming my own view.
15. I dislike unpredictable situations.

B. Need for cognition (8-items scale, from (Cacioppo, Petty, & Feng Kao, 1984) – items loading on 0.67 or more)

1. I would prefer complex to simple problems.
2. I don't like to have the responsibility of handling a situation that requires a lot of thinking.*
3. Thinking is not my idea of fun.*
4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.*

5. I find little satisfaction in deliberating hard and for long hours.*
6. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.*
7. I only think as hard as I have to.*
8. I prefer to think about small, daily projects to long-term ones.*

C. Risk (Risk propensity Scale, from (Meertens & Lion, 2008))

1. Safety first.*
2. I do not take risks with my health.*
3. I prefer to avoid risks.*
4. I take risks regularly.
5. I really dislike not knowing what is going to happen.*
6. I usually view risks as a challenge.
7. I view myself as a risk seeker.

D. Uncertainty orientation (From (Smith & Bristor, 1994), adapted from (Sorrentino, Bobocel, Gitta, Olson, & Hewitt, 1988))

1. I believe it is important for us to challenge our beliefs.
2. If I do not understand something, I find out about it.
3. I like to experiment with new ideas, even if they turn out later to be a total waste of time.
4. I enjoy spending time discovering new things.
5. I like to find out why things happen.
6. I often put myself in situations in which I can learn something new.
7. I enjoy thinking about ideas that challenge my views of the world.

2. Time perspective: Consideration of future consequences scale (7 items, (Strathman, Gleicher, Boninger, & Edwards, 1994))

In this section, the respondents had to tick for each item one of the following options: “Strongly disagree”, “Disagree”, “Neutral”, “Agree”, “Strongly agree”. Items followed by an asterisk were inverted for the analysis.

1. I only act to satisfy immediate concerns, figuring the future will take care of itself.*
2. My behaviour is only influenced by the immediate (i.e., a matter of days or weeks) outcomes of my actions.*
3. I think it is important to take warnings about negative outcomes seriously even if the negative outcome will not occur for many years.
4. I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level.*
5. I think that sacrificing now is usually unnecessary since future outcomes can be dealt with at a later time.*
6. I only act to satisfy immediate concerns, figuring that I will take care of future problems that may occur at a later date.*
7. Since my day to day work has specific outcomes, it is more important to me than behaviour that has distant outcomes.*

3. Myths of nature

In this section, the respondents had to tick for each item one of the following options: “Strongly disagree”, “Disagree”, “Neutral”, “Agree”, “Strongly agree”.

A. Hierarchical: Perverse/ tolerant
(Stable environment within discoverable limits, unstable beyond those limits.
Institutionalised authority & inequality)

- a) Problem framing
    1. If we push the natural environment beyond what it can cope with there will be no turning back.
    2. The natural environment is manageable within the known limits.
    3. The natural environment will become unstable if humans exceed the limits identified by experts.
    4. When pushed beyond the limits identified by experts the natural environment will not recover.

- b) Policy solution
    1. Individuals should follow environmental rules and regulations regardless of whether they think it's fair.
    2. Sustainable development is the most rational strategy for managing the natural environment.
    3. The Government and scientists should be responsible for managing the natural environment.
    4. The natural environment can be managed if there are clear rules about what is allowed.
    5. The natural environment can remain healthy if we follow environmental regulations and laws.

B. Egalitarian: Ephemeral
(Intricately interconnected environment with severing of connections resulting in collapse of entire system. Voluntary consent & fairness.)

- a) Problem framing
    1. All things in the natural environment are interconnected and dependent on each other.
    2. Humans are part of the natural environment, not separate from it.
    3. If the balance of the natural environment is upset the whole system will collapse.
    4. The natural environment is fragile and the balance can be easily upset.
    5. The natural environment is in a constant state of change with things only existing for a short time.

- b) Policy solution
    1. Environmental regulations often result in outcomes that are unfair to the natural environment.
    2. Authorities managing the natural environment frequently make unethical decisions.
    3. The natural environment can only be protected if there are large changes in human behaviour and society.
    4. We all have a moral obligation to protect the environment and consume fewer resources.
    5. Conservation and protection is the most rational strategy for managing the natural environment.

C. Individualistic: Benign
(Environment capable of bouncing back from whatever humans deliver. Competition, self-regulation & techno-fixes.)

- a) Problem framing
    1. Human industry and technology has not caused significant damage to the natural environment.
    2. There are plenty of resources for humans to use in the natural environment.
    3. The natural environment is capable of recovering from any damage humans may cause.
    4. The natural environment is strong and can easily adapt to human activity.
    5. The natural environment is able to cope with a lot more than it is given credit for.

- b) Policy solution
    1. Reducing the amount of environmental regulations will allow society to benefit and grow.
    2. Economic competition and deregulation is the most rational strategy for managing the natural environment.
    3. Economic markets are more than capable of managing the natural environment sustainably.
    4. Individuals should have freedom of choice regardless of the environmental impacts.
    5. Technology can solve environmental problems.

D. Fatalistic: Capricious
(Environment operating without rhyme or reason. External control, apathy)

- a) Problem framing
    1. Humans can't control what happens in the natural environment.
    2. Often there's no explanation or reason for the things that happen in the natural environment.
    3. The natural environment can be harsh and unfair.
    4. The natural environment is unpredictable.
    5. The natural environment operates in strange and unknown ways.

- b) Policy solution
    1. There's no point wasting time, energy and resources on trying to manage the natural environment.
    2. Environmental rules and regulations are just a way for the authorities and environmentalists to control individuals.
    3. Attempts to manage the natural environment usually end in failure.
    4. Doing nothing is the most rational strategy for managing the natural environment.
    5. Ultimately, there's nothing individuals can do to manage or change the natural environment.

4. Social Dominance Orientation short scale

In this section, the respondents had to tick for each item one of the following options: “Strongly disagree”, “Disagree”, “Neutral”, “Agree”, “Strongly agree”.

1. In setting priorities, we must consider all groups.*

2. Group equality should be our ideal.*
3. Superior groups should dominate inferior groups.
4. We should not push for equality between groups.

5. Right-Wing authoritarianism short scale

In this section, the respondents had to tick for each item one of the following options: “Strongly disagree”, “Disagree”, “Neutral”, “Agree”, “Strongly agree”.

1. Our customs and national heritage are the things that have made us great, and certain people should be made to show greater respect for them.
2. Our prisons are a shocking disgrace. Criminals are unfortunate people who deserve much better care, instead of so much punishment.*
3. Obedience and respect for authority are the most important virtues children should learn.
4. Organisations like the army have a pretty unhealthy effect upon men because they require strict obedience of commands from supervisors.*
5. The courts are right in being easy on drug offenders. Punishment would not do any good in cases like these.*
6. Being kind to bludgers or criminals will only encourage them to take advantage of your weakness, so it is best to use a firm, tough hand when dealing with them.

6. Political affiliation

On the following scale, please indicate how you identify your political views.

1 = very liberal through to 5 = very conservative

7. Climate beliefs

1. How much do you think humans contribute to climate change?

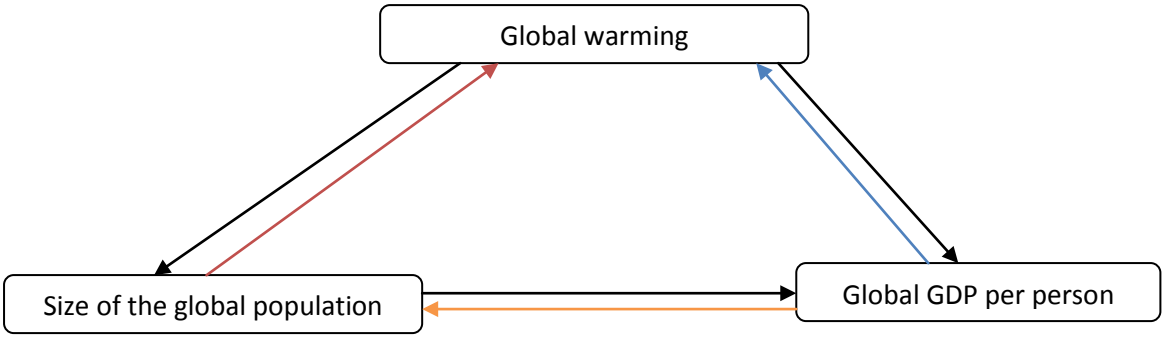
   ☐0% ☐15% ☐30% ☐45% ☐60% ☐75% ☐90% ☐100%

2. What best describes your thoughts about climate change?
   - I don't think that climate change is happening.
   - I have no idea whether climate change is happening or not.
   - I think that climate change is happening, but it's a natural fluctuation in Earth's temperatures.
   - I think that climate change is happening, and I think that humans are largely causing it.

8. Model APE

Mental model used to reason about climate change

Consider a global system made up of three variables: i) global economy (represented by the global Growth Domestic Product (GDP) per person. As the global GDP per person is the value of all the goods and services produced in the world divided by the number of people, it indicates the strength of the economic activity), ii) the size of the global population (P) and iii) the state of the climate (E, for the environment, represented by the global temperature rise).



Stable relationships

First, we assume that:

Impact of the global economy on Population:

- When GDP per person increases, the birth rate decreases. It is empirically shown (at least in developed countries) that the wealthier people become the less children they have. This in turns may lead to population decline.

Impact of Activity on Environment:

- When GDP per person increases, energy use per capita increases. As a result, the amount of CO2 in the atmosphere increases.

Impact of Population on Environment:

- When the global population increases, the amount of CO2 in the atmosphere increases.

These three relationships come from reliable observations and as there is little debate on them, we assume they are correct for this exercise.

1. How much do you trust these statements?

☐Not at all ☐Not much ☐I am not sure ☐Reasonably well ☐A lot

2. Would you like to comment on these statements?:

Relationships affected by beliefs

However, there is no consensus on the following issues. Please give your opinion for each of them:

1. Maximum number of people who could live on the Earth (Earth carrying capacity):

We all know the Earth is finite in size and resources. Thus, it can't support an infinite number of human beings. In your opinion, what is the maximum number of people who could live on the Earth? (In 2012, there are approximately 7 billion people in the World)

☐15 billon ☐27 billion ☐40 billion

2. Critical temperature:

We believe that if the global warming reaches a certain value (the "critical temperature value") the human activity will be affected and the GDP per capita will decrease. However, scientists don't agree on the value of this critical temperature.

- The most optimistic believe that we won't see any effect on the economy until the global warming reaches 5°C.
- The most pessimistic believe that climate change will start to affect the economy from an increase in the global temperature of 1.7°C.

In your opinion, what statement is the most likely?

Climate change will start to affect the economy from a global warming of:

☐1.7°C ☐3.3°C ☐5°C

3. Climate sensitivity:

Scientists don't agree on how much the rise of CO_2 in the atmosphere affects the global temperature.

- The most optimistic believe that if the amount of CO_2 in the atmosphere doubled, the rise in global temperature would be 1°C.
- The most pessimistic believe that if the amount of CO_2 in the atmosphere doubled, the rise in global temperature would be 3.4°C.

In your opinion, if the amount of CO2 in the atmosphere doubled, the rise on global temperature would be:

☐1°C (weak sensitivity) ☐2.2°C (mild sensitivity) ☐3.4°C (strong sensitivity)

Relationships affected by opinions

According to your beliefs regarding the parameters above, give your opinion about the following policies:

1. We should reduce the human global emissions of CO2 by:

☐There is no need to reduce our emissions (go to the "Predictions" subsection)

☐5% ☐45% ☐90%

2. 90% of the goal chosen above should be achieved by:

☐2020 ☐2060 ☐2100

3. If we manage to reach the goal you chose, how much do you think it will cost:

☐0% of the GDP ☐10% of the GDP ☐20% of the GDP

Predictions

Assuming the policies you chose are implemented, what do you think it will happen by 2100 compare to nowadays?

1. The global population will:

☐Strongly decrease ☐Slightly decrease ☐Stay stable ☐Slightly increase ☐Strongly increase

2. The global GDP per person will

☐Strongly decrease ☐Slightly decrease ☐Stay stable ☐Slightly increase ☐Strongly increase

3. The global temperature will:

☐Strongly decrease ☐Slightly decrease ☐Stay stable ☐Slightly increase ☐Strongly increase

9. Reflection test

1. If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?
   (If you think the question is too hard, simply skip this question)
2. In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?
   (If you think the question is too hard, simply skip this question)
3. A bat and a ball together cost 110 cents. The bat costs 100 cents more than the ball. How much does the ball cost?
   (If you think the question is too hard, simply skip this question)

10. Attitude towards science

In this section, the respondents had to tick for each item one of the following options: “Strongly disagree”, “Disagree”, “Neutral”, “Agree”, “Strongly agree”.

1. I strongly believe in science.
2. I believe science can provide solutions to environmental problems.
3. I do not believe science can provide solutions to social problems.

4. Science has caused more problems than it has resolved.
5. I am reluctant to use technology (including computers and models) to address complex natural and social problems.

11. Attitude towards computer Models

1. Which of the following statements best matches you?
   - I do not know what computer modelling is.
   - I have a rough idea of what computer modelling is.
   - I have seen computer modelling at work or its results in some occasions.
   - I am familiar with computer modelling.
2. Read each statement and decide whether you agree or disagree with each one of them. (In this subsection, the respondents had to tick for each item one of the following options: “Strongly disagree”, “Disagree”, “Neutral”, “Agree”, “Strongly agree”.)
   - I trust the results of computer models.
   - The results of computer models can help with making decisions about important matters.
   - Using computer models can teach how real systems work.
   - Using computer models is like playing a game - it doesn't mean anything in the real world.
   - I would like to learn how to do computer modelling.
   - Computer modelling will become more and more common in the future.

12. Trust information provided by:

In this section, the respondents had to tick for each item one of the following options: “Not at all”, “Not much”, “I am not sure”, “Reasonably well”, “A lot”.

1. Experts: How much do you trust the information provided by:
   - Scientists
   - Environmental organisations
   - Federal Government
   - Local Government
2. Non-experts: How much do you trust the information provided by:
   - Family and friends
   - Your doctor
   - People from your community
   - Television, Newspapers & Internet

13. Environmental commitment

In this section, the respondents had to tick for each item one of the following options: “Strongly disagree”, “Disagree”, “Neutral”, “Agree”, “Strongly agree”.

1. I am personally committed to preventing environmental problems.
2. I am personally committed to actively address environmental problems and make improvements.
3. Environmental problems are not as important as many other problems facing the world today.
4. I am concerned about environmental problems because of the potential consequences on:
   - My lifestyle
   - My health
   - My community
   - The World

14. Environmentalism

Do you consider yourself an environmentalist?

☐No, not at all ☐No, not much ☐A little ☐Yes ☐Yes, definitely

15. Australia 2050

1. What are the 5 issues which concern you the most about the future Australia in 2050?
2. What 5 words or phrases would you use to describe Australia in an ideal 2050?
3. What 5 words or phrases would you use to describe Australia in the worst imaginable 2050?
4. What decisions and actions are we making now that may create a worse future for Australians in 2050?
5. What decisions and actions are we making now that may create a better future for Australians in 2050?
6. How safe do you think Australia will be in 2050?
   - Much less safe than now
   - Less safe than now
   - More or less as safe as now
   - Safer than now
   - Much safer than now
7. How honest do you think Australians will be in 2050?
   - Much less honest than now
   - Less honest than now
   - More or less as honest as now
   - More honest than now
   - Much more honest than now
8. How friendly do you think Australians will be in 2050?
   - Much less friendly than now
   - Less friendly than now
   - More or less as friendly as now
   - More friendly than now
   - Much more friendly than now
9. How skilled do you think the Australian society will be in 2050?
   - Much less skilled than now
   - Less skilled than now
   - More or less as skilled as now
   - More skilled than now
   - Much more skilled than now
10. How do you think the standards of living in Australia will be in 2050?
    - Much lower than now
    - Lower than now
    - More or less the same as now
    - Higher than now
    - Much higher than now

16. Demographics

1. Please indicate your age.

2. What is your gender?
3. Please select the category which best describes your occupation.
4. Do you own your property or are you renting?
5. How would you describe your household?
6. What is the highest level of education you have achieved?
7. What is your household's gross annual income before tax?

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