# Climate Action as Collective Action: Opportunities for the Classroom

The **Leipzig** Public **Climate School**
November 27th, 2019

EvoLeipzig

Max Planck Institute for Evolutionary Anthropology

Global ESD


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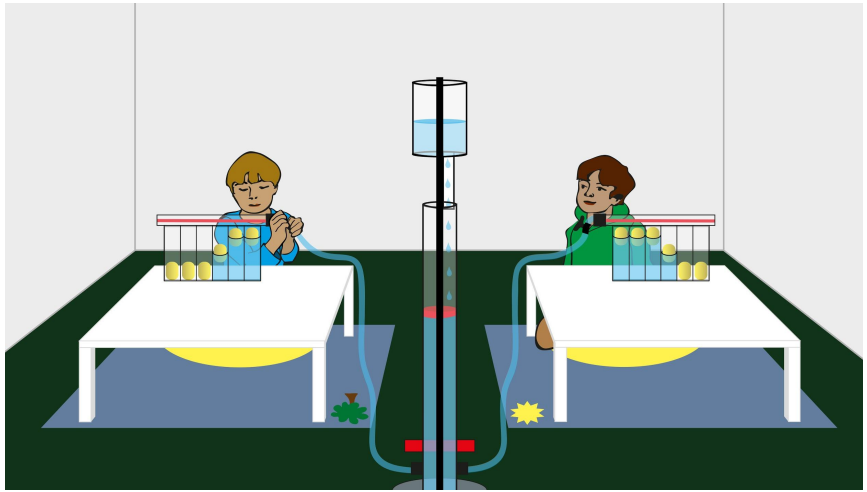
# Outline

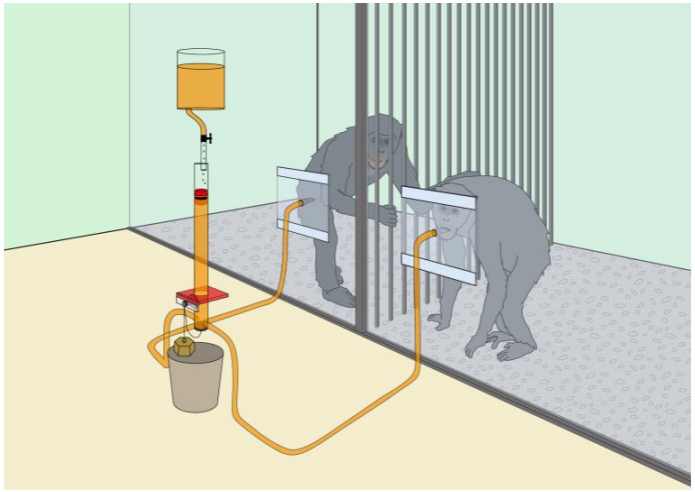
- Childhood research in education for effective climate action?
  - Example: a comparative cooperation experiment
- Understanding climate action as collective action
- Metacognitive pathways model for developing ESD competencies
  - Example: Prosocial
  - Example: OpenMind
  - Example: GlobalESD design concept
- Community Science Lab

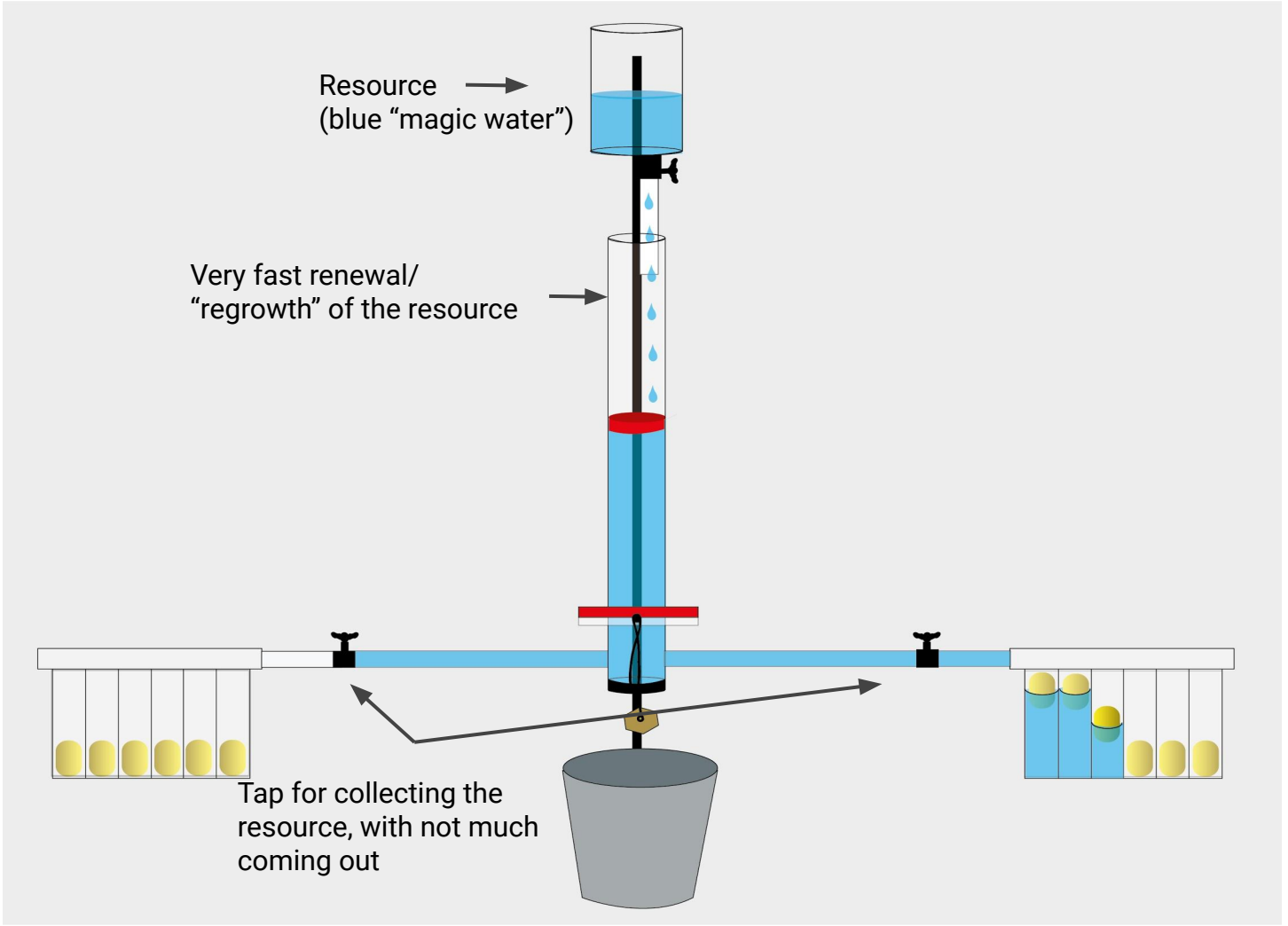
How can our scientific understanding of children contribute to education for effective climate actions?

# Excursion: A behavioral experiment

- A comparative cooperation experiment conducted at the Max-Planck-Institute for evolutionary Anthropology

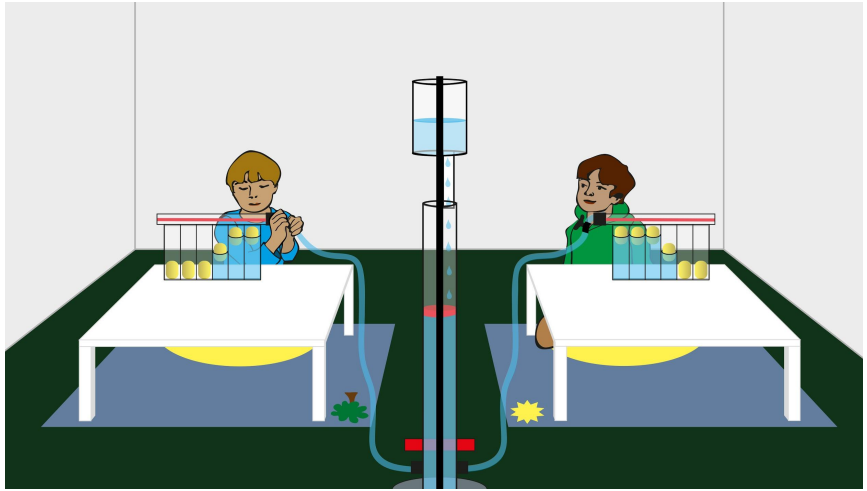


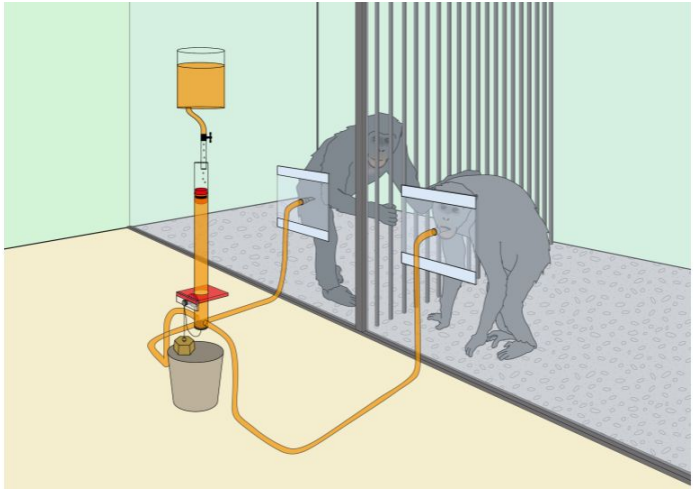



Resource
(blue “magic water”)
Very fast renewal/
“regrowth” of the resource
Tap for collecting the
resource, with not much
coming out

# Excursion: A behavioral experiment

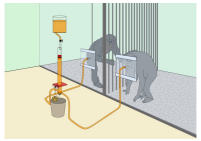
- How do you think each species behaved?
- Who was overall better at this cooperative task?

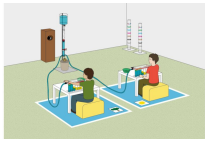




# What do other students and teachers think?

Which species will generally be more successful in this experiment?





| | n | Chimpanzees | Children |
|---|---|---|---|
| Grade 6 | 17 | 66% | 33% |
| Grades 9-10 | 105 | 77% | 23% |
| Grade 11 | 14 | 79% | 21% |
| Biodidaktik students | 60 | 80% | 20% |
| Biology teachers | 11 | 100% | 0% |

# What do other students and teachers think?

“The chimpanzees have to share in nature.”

“The chimpanzees live in groups and they know they can only survive together.”

“The chimpanzees depend on the resources in nature so they know how to save and use them sustainably.”

# What do other students and teachers think?

“Humans are greedy animals”

“Children just think about themselves and they will compete.”

“Children don’t learn that resources are limited, they just get everything they want.”

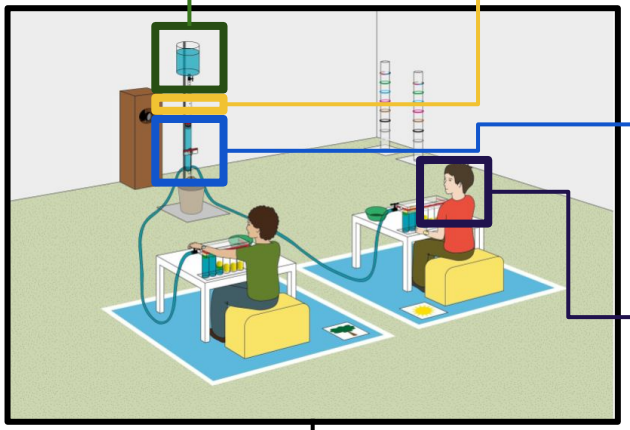
“Humans are selfish.”

# Discussion

Why do you think students and teachers think this?

Do these beliefs matter for how we view actions for sustainable development?

**Climate** Action **= Collective** Action



Total (future) resource

Resource renewal rate

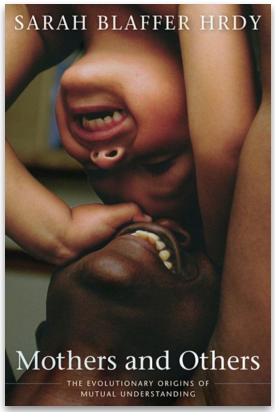
Available resource

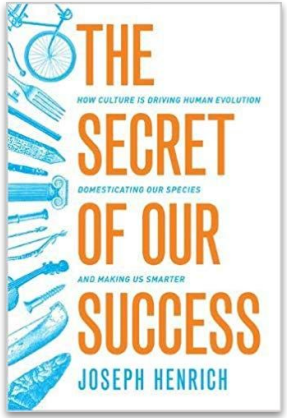
Individuals with variable beliefs, goals, behaviors

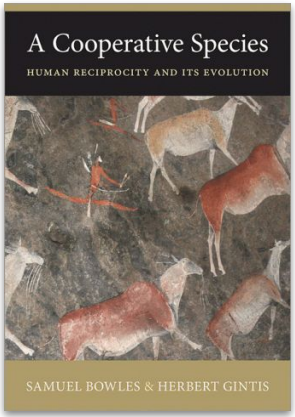
**Group size**

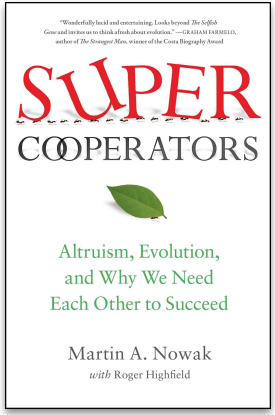
E.g. Fossil fuels and climate change

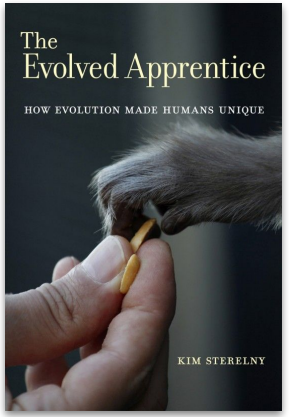
# The Cooperation Paradox



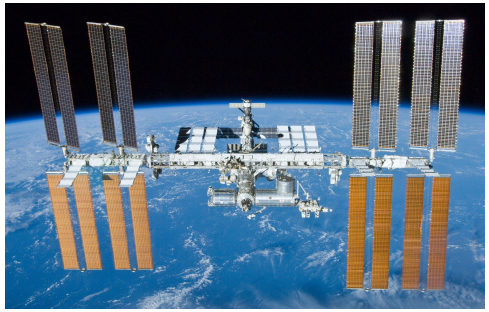



# “Invisible” cooperation?



# The Cooperation Paradox

The **17 Global Goals** for Sustainable Development identified by the **United Nations**

# **Climate** Action **=** **Collective** Action

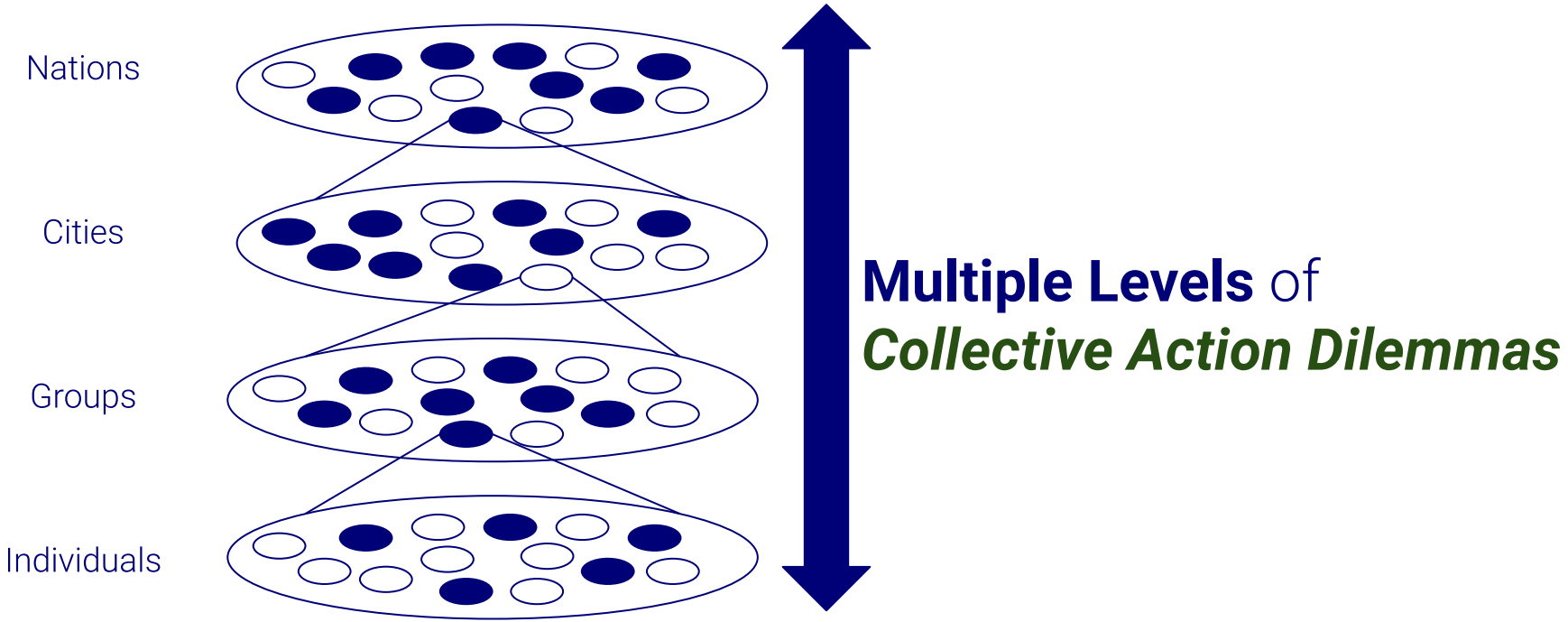
How can we help students develop a deeper understanding of collective action as a concept?

How can we help students develop the psychological flexibility to engage collective action as a citizen?

**Systems** Change

**Individual** Change

# **Systems** Change




# **Individual** Change

Collective Action **=** Human Behavior

**Sustainability-Relevant Behaviors**

# Sustainability-Relevant Traits

## Behavior ◆ Cognition ◆ Culture

# ESD Competencies

*Sustainability-relevant traits*

**Systems thinking** competency

**Critical thinking** competency

**Evaluation** competency

**Self-regulation** competency

**Cooperation** competency

**Future thinking** competency

# **E**ducation for **S**ustainable **D**evelopment (**ESD**)

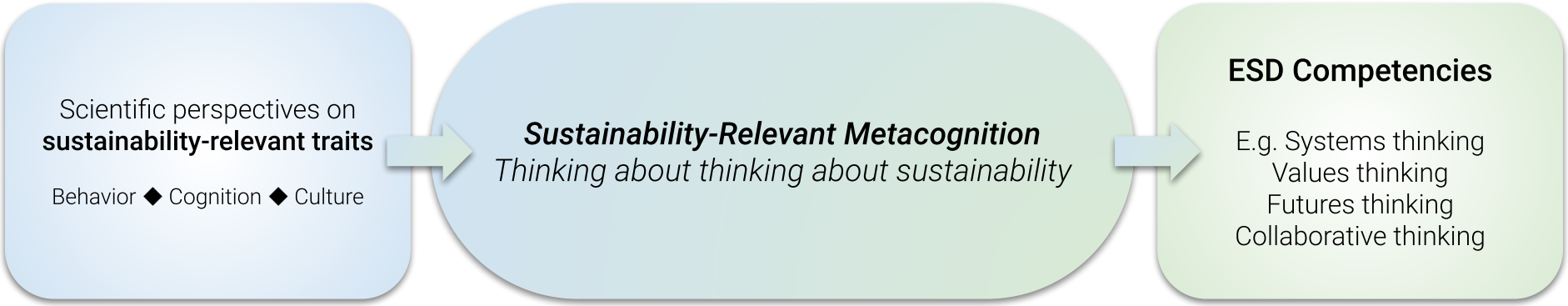
What should **education** look like to effectively **address** the **climate crisis**?

# Two models of ESD competencies development

- **Engineering** childhood **environments** and **experiences**
    - Research into childhood development can inform how educators design the kinds of environments and experiences understood to cultivate sustainability-relevant traits

- Cultivate **metacognition** on sustainability-relevant traits
    - Research into childhood development can itself serve as educational content to drive **student thinking about human thinking** and sustainability-relevant behaviors.

# A hypothesized metacognitive pathway for the development of ESD competencies



# A hypothesized metacognitive pathway for the development of ESD competencies

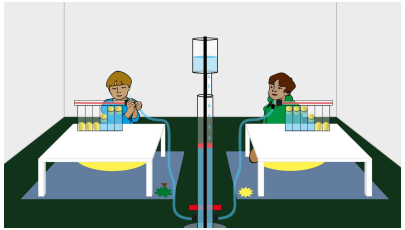
Scientific perspectives on **sustainability-relevant traits**

Behavior ◆ Cognition ◆ Culture

***Sustainability-Relevant Metacognition***
*Thinking about thinking about sustainability*

**ESD Competencies**

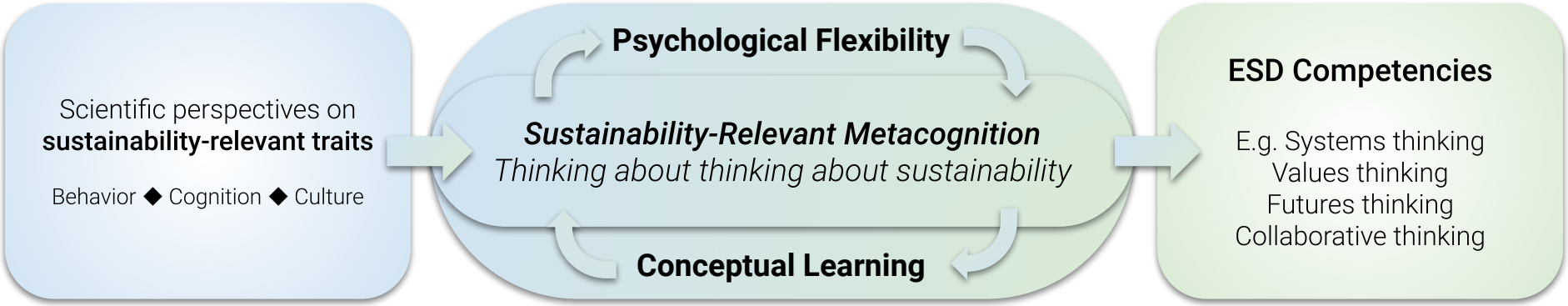
E.g. Systems thinking
Values thinking
Futures thinking
Collaborative thinking



***Reflection on Mental Models of Human Cooperation***

**?**

# A hypothesized metacognitive pathway for the development of ESD competencies



# Programs congruent with or informed by the metacognitive pathways model

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How do we foster cooperation within and between groups?

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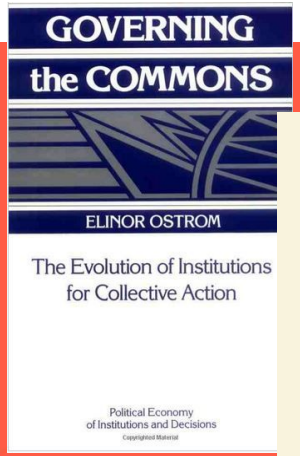
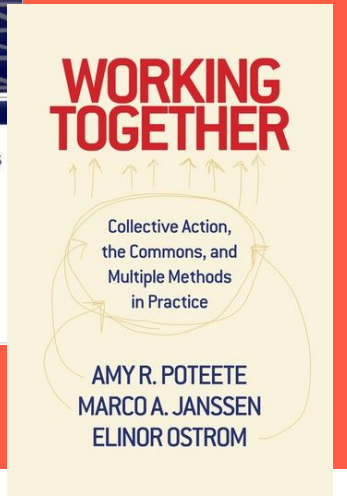
How do we approach disagreements over ethical issues?

How can students develop the conceptual understandings and psychological flexibility needed to engage in sustainability-relevant issues?

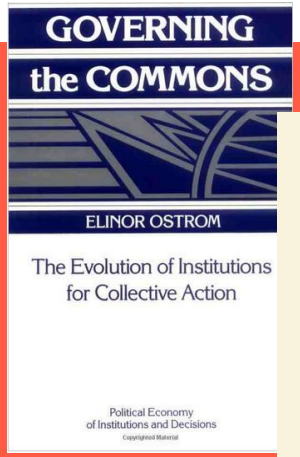
# Elinor Ostrom

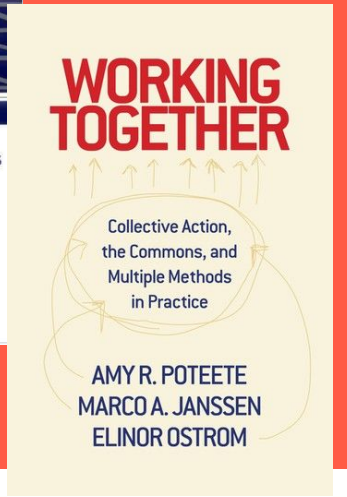


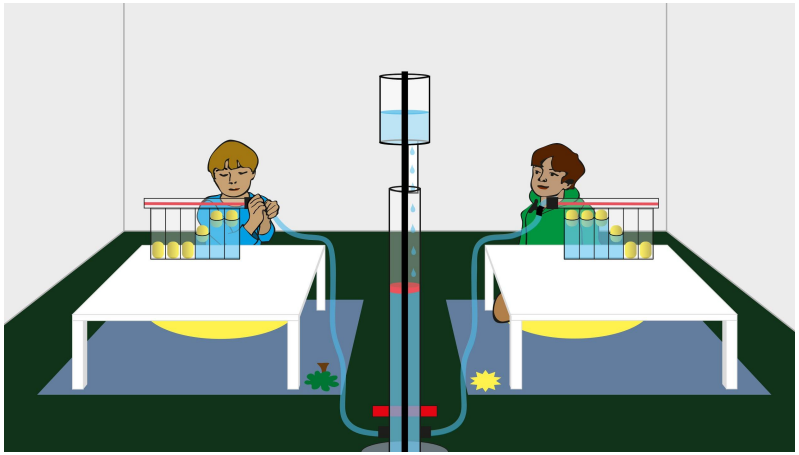

- First woman to win Nobel Prize in Economics in 2009 for her work developing a **theory of collective action**:
  - Can and do humans work together to sustainably manage shared resources? If so, how?

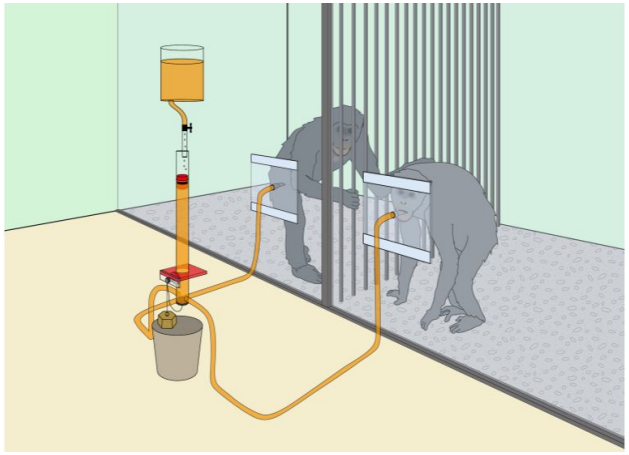
# Elinor Ostrom




- Demonstrated that **humans can cooperate** around shared resources **under certain conditions** (“**Ostrom’s Core Design Principles**”)





nature human behaviour

ARTICLES

https://doi.org/10.1038/s41562-018-0327-2

**An investigation of children's strategies for overcoming the tragedy of the commons**

Rebecca Koomen* and Esther Herrmann

**Chimpanzees overcome the tragedy of the commons with dominance**

Rebecca Koomen & Esther Herrmann

Recommended reading: R. Koomen - What children can teach us about looking after the environment

“**Why should we teach the theory of collective action** [...] ?

My answer to this question is that **the theory of collective action is a core explanatory theory** related to **almost every ‘political problem’ addressed by citizens**, **elected officials, political action groups, courts**, **legislatures**, and **families**.

At any time that **individuals may gain** from the **costly actions of others**, without **themselves contributing time and effort**, they face **collective action dilemmas** for which there are **coping methods**.”

Elinor Ostrom (1998)
The Need for **Civic Education**: A **Collective Action** Perspective

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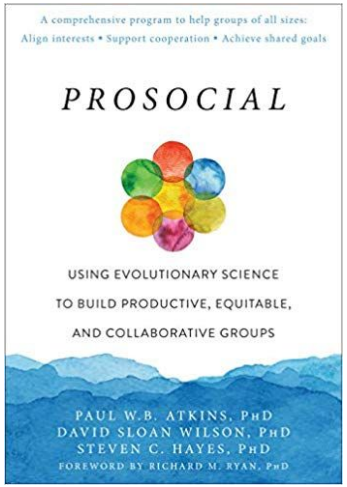
www.prosocial.world

- Informed by cooperation science, evolution science, behavioral science
- A group facilitation process, an online community, and a research method for improving cooperation within and between groups



**Paul Atkins**

Organizational Psychology

**David Sloan Wilson**

Evolutionary Anthropology

**Steven Hayes**

Contextual Behavioral Science

# **C**ore **D**esign **P**rinciples for **Cooperation**

1 Clear group identity and shared sense of purpose

2 Fair distribution of costs and benefits

3 Inclusive decision-making

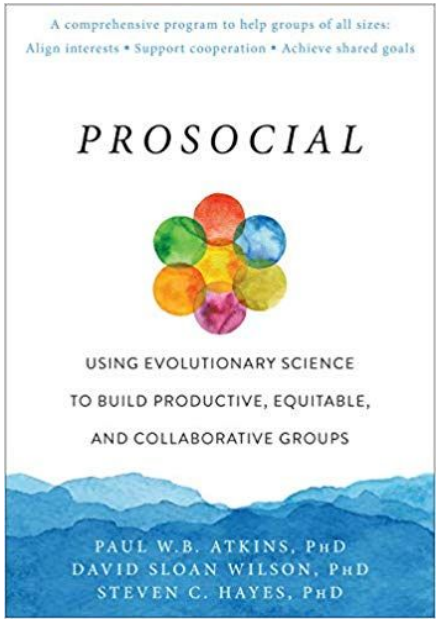
4 Monitoring progress towards goals

5 Graduated responding to helpful and unhelpful behavior

6 Fast and fair conflict resolution

7 Recognition of group and member autonomy

8 Appropriate relations with other groups



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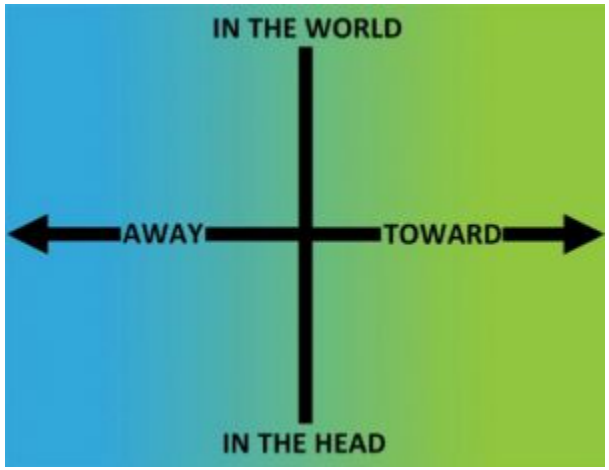
- Elinor Ostrom's **cross-cultural** research identified **8 Core Design Principles** for effective cooperation
- **Evolutionary perspective** on human **cooperation**
- Evidence-based practices for enhancing **psychological flexibility**
- Participants learn about these **scientific perspectives** and reflect on their own **group cooperation dynamics**



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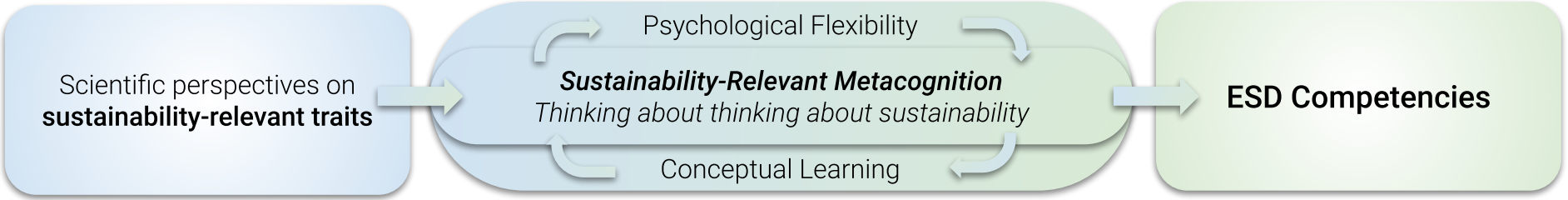
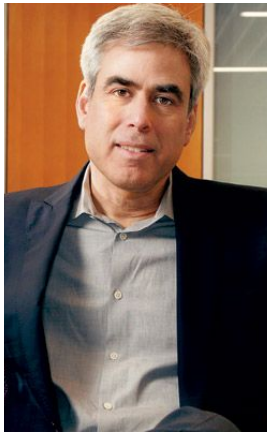


OpenMind™

- Developed by Jonathan Haidt at NYU and colleagues
- How do we approach moral disagreements over sustainability-relevant issues?
- An online course and in-person workshop model
- Teaches **scientific perspectives** in cognitive and moral psychology to help students engage **increased perspective taking** and **decrease polarization** around contentious sustainability-relevant issues.
- Used in universities, school and teacher-training contexts



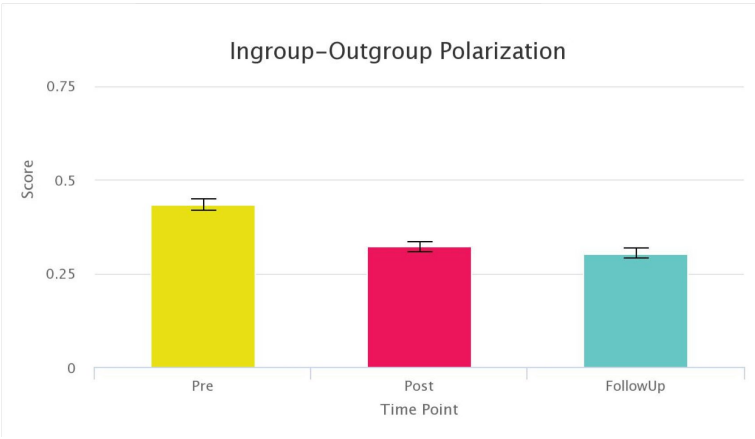
Jonathan Haidt,
Social psychologist

www.Openmindplatform.org

# Research Basis

As of August 2019, OpenMind has reached **more than 17,000 users** across **almost 40 countries**.

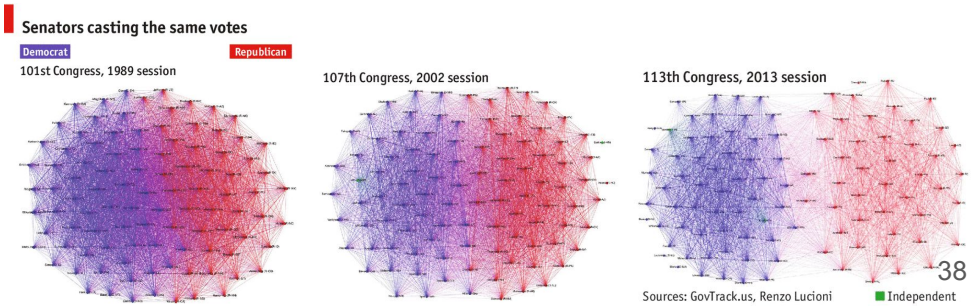
~70% of users report less polarized attitudes after using the program



OpenMind™

## Content Overview

- Dual process cognition
- Moral intuitions (“Moral Taste Buds”)
- Cultivating intellectual humility
- Strategies for constructive disagreements



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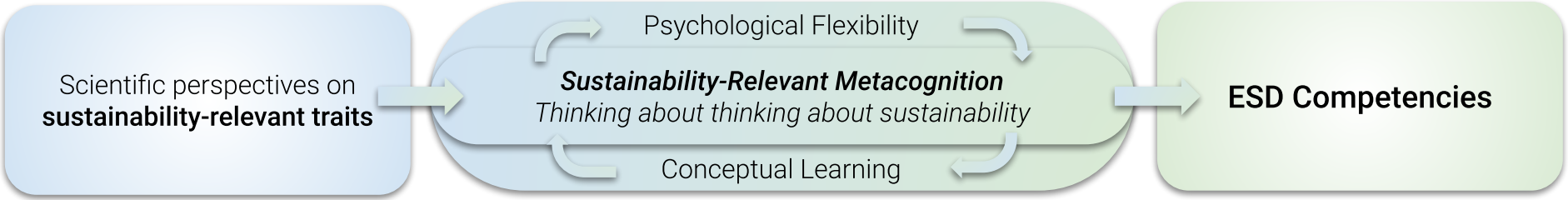
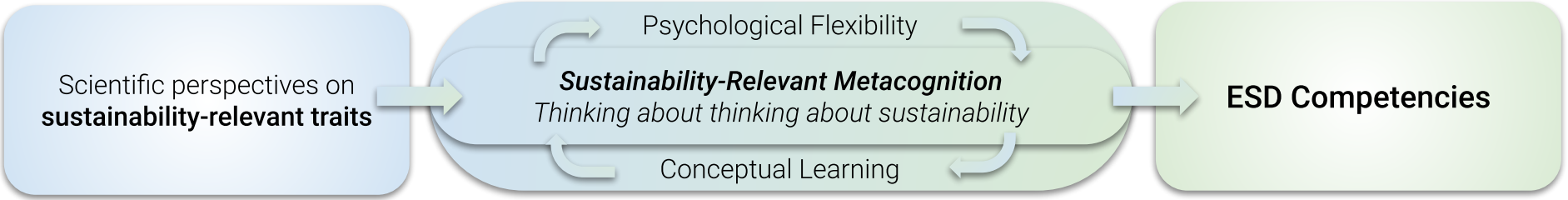

Scientific perspectives on
**sustainability-relevant traits**
Psychological Flexibility
***Sustainability-Relevant Metacognition***
*Thinking about thinking about sustainability*
Conceptual Learning
**ESD Competencies**

Global ESD

# Educational Design Concept




"Reflecting on the **everyday experience** of **human behavior** in the light of **evolution** and **sustainability**"

## Design Principles

Overarching principles for the identification of content and teaching methods

### Focus on **Human Behaviors**

**Focus** on the aspects and everyday experience of human behaviors relevant to human well-being and sustainable development (e.g. cooperation, empathy, sense of fairness, teaching and learning, ….)

### Explore **Complex Causality**

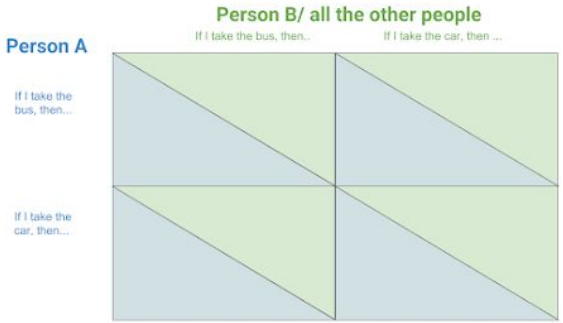
**Explore and reflect** on the many causes and consequences of human behavior and on the complex causal relationships in human evolution, human development and in social-ecological systems

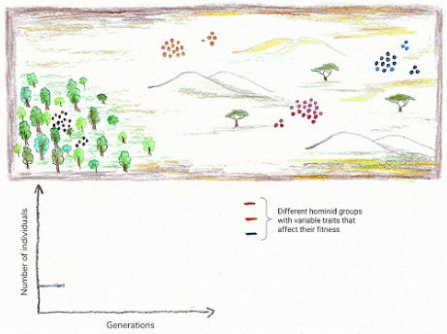
### Teach for **Transfer of Learning**

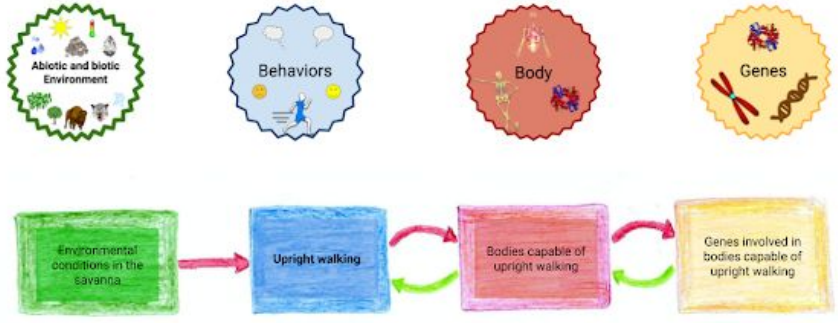
**Transfer** of principles and questions to novel phenomena, everyday experience and real-world problems of sustainable development

# Content Anchors

# Teaching Tools




| An observable trait/behavior/ phenomenon in biology/society | | How does it work? What triggered it? Where did it come from? When did it come about? | What outcomes does it create? Why does it exist today? (Adaptive Significance) |
|---|---|---|---|
| Proximate past | **Mechanism(s)** milliseconds, seconds, minutes, hours, days before | **Internal**: sensing and perception of environmental stimuli, neural networks, brain areas, hormones, emotions, thoughts,, System 1, System 2, gene expression<br><br>**External**: stimuli in the social, cultural, biotic, abiotic environment | How does the observed trait function in its context regarding its survival/retention/ reinforcement/ transmission/ reproduction? |
| | **Development** months, years, decades before | **Internal**: experiences, learning, memories, habits, maternal effects, epigenetics, genes<br><br>**External**: social, cultural, biotic, abiotic environment | How has the trait and its development functioned over life history regarding its survival/retention/ reinforcement/ transmission/ reproduction? |
| | **Cultural history** decades, centuries, millennia before | | |
| Distant past | **Evolutionary history** thousands, millions of years before | **Internal**: genes, epigenetics, developmental processes, homological structures and functions<br><br>**External**: social, cultural, biotic, abiotic environment | How has the trait and its development functioned over (cultural and) evolutionary history regarding its survival/retention/ reinforcement/ transmission/ reproduction? |

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Scientific perspectives on **sustainability-relevant traits**

Psychological Flexibility

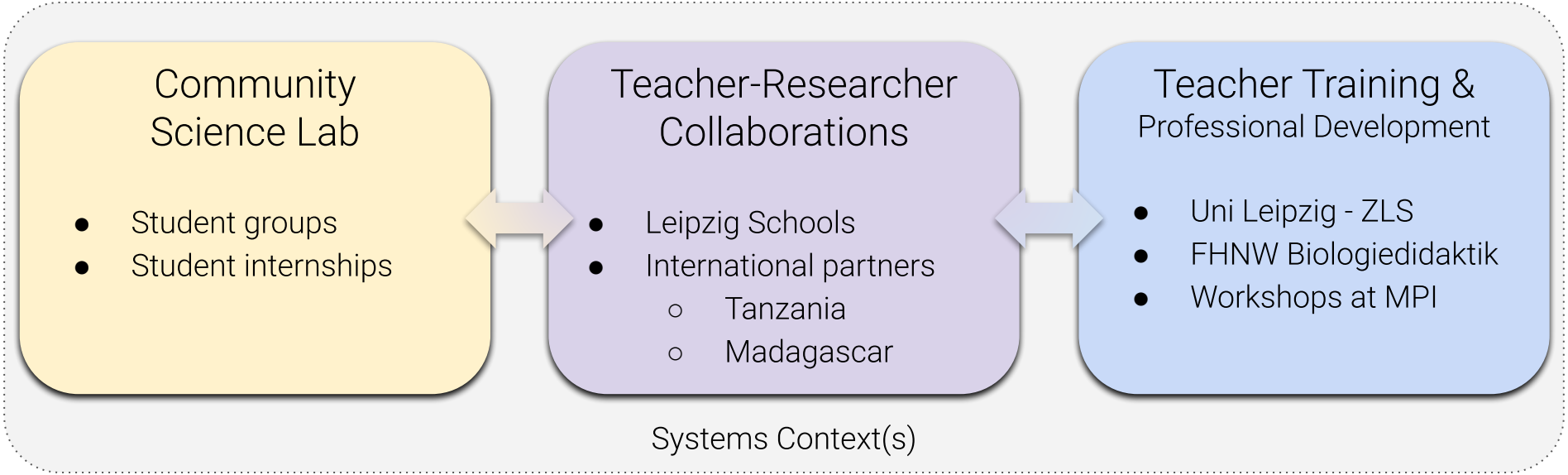
***Sustainability-Relevant Metacognition***

*Thinking about thinking about sustainability*

Conceptual Learning

**ESD Competencies**

# Stakeholder engagement and future development prospects




Development of an applied *Design-Based Implementation Research* (**DBIR**; McKenney & Reeves 2018) program that facilitates the long-term collaborative development of teaching strategies

EvoLeipzig

Max Planck Institute for Evolutionary Anthropology

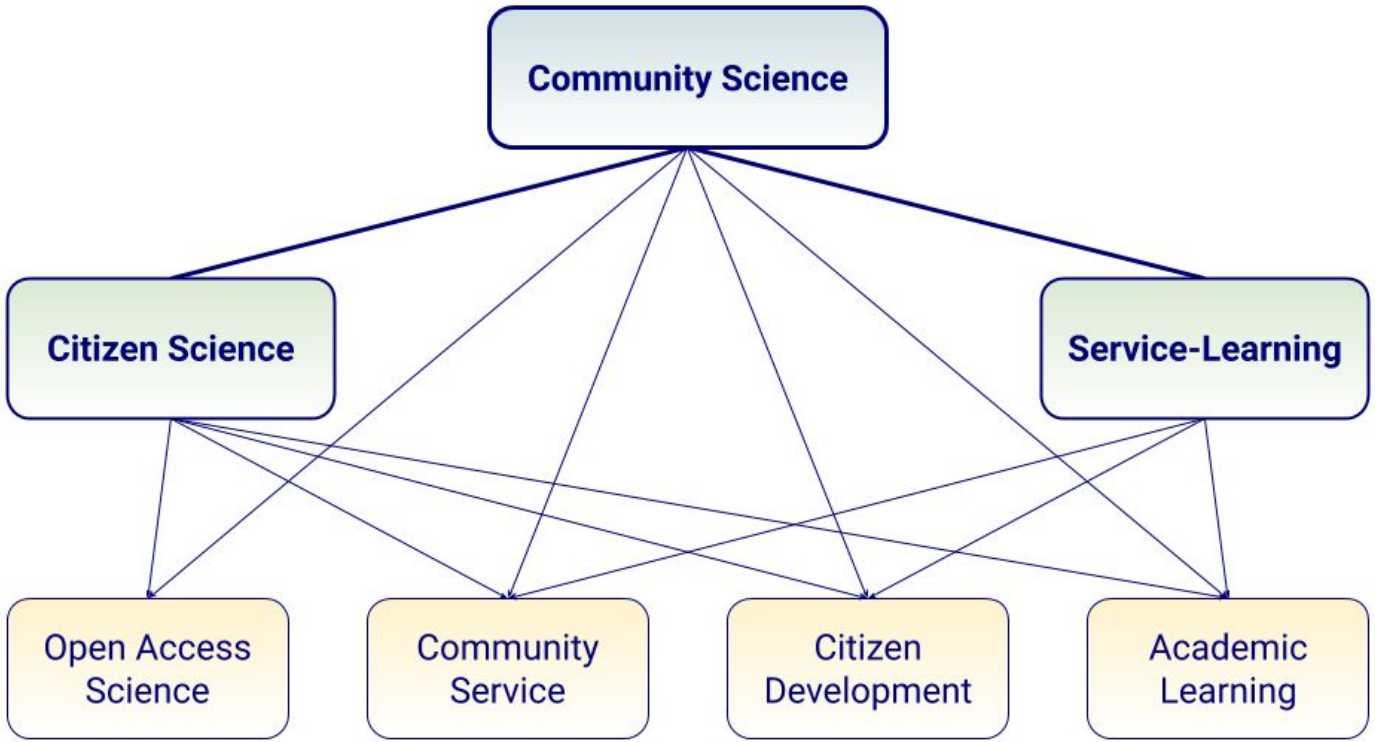
Global ESD

# Community Science Lab

## For the Understanding of Humans

We create **collaborative spaces** for scientists, teachers, and young researchers (students in grades 5-12) to **explore** how humans come to **understand** the **concepts** of **human evolution, behavior,** and **sustainability science**, and how such understandings can drive **sustainable community development**.

# Community Science - **Spectrum of Practice**



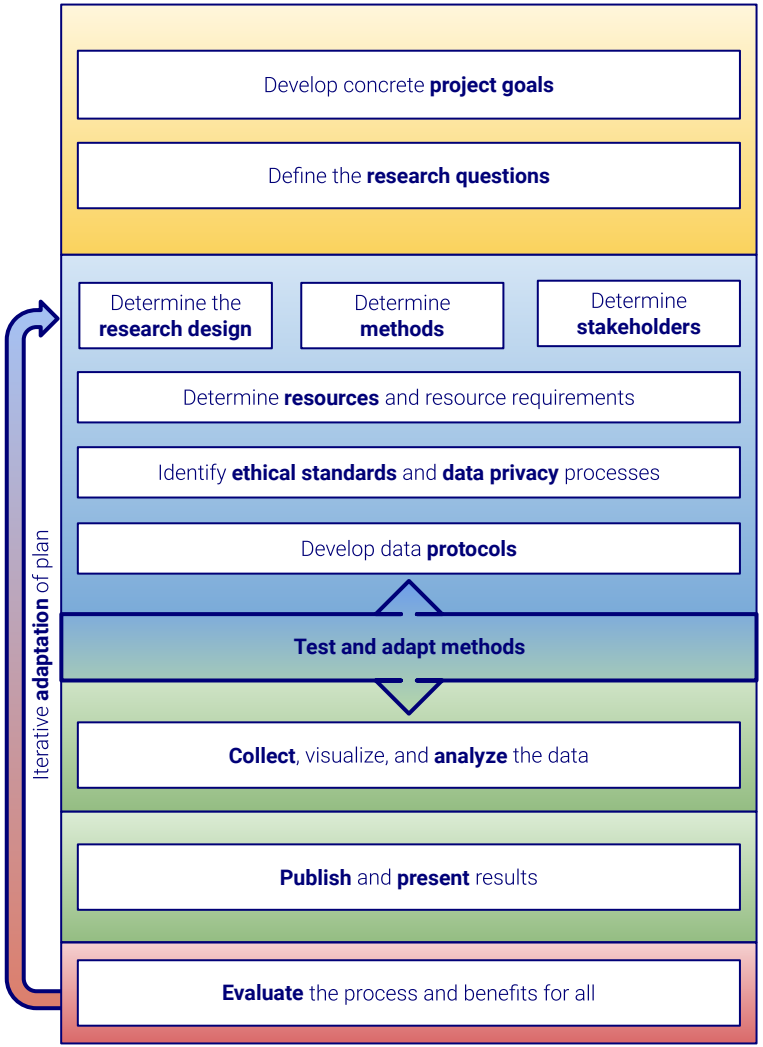
# Community Science Lab

Semester Lab Session Program

- (n=5) **8th graders** and (n=3) **MPI-EVA researchers** meet at MPI-EVA **weekly** to collaboratively develop social science research projects focused on **understanding** the **cooperation dynamics** of our **own communities**

- Informed by ***Prosocial*** research methods

# Community Science Workflow




Bürger schaffen Wissen
Die Citizen Science Plattform

Adapted from *Citizen Science for All* Model
Pettibone et al (2016)

# Case Examples

- Fridays for Future (F4F)
- School Gardens
- School Governance

# [Leipzig] For Future

- Global decentralized network of networks
  - “Polycentric” leadership distributed across tasks and regions

- **August 2018,** Greta begins School Strike in Sweden
- **November 2018,** thousands of students in Australia begin striking on Fridays
- **January 2019,** at least 45,000 students in Germany and Switzerland begin to protest
- **March, May, September 2019,** Global marches and week long protests around the world reportedly attract millions of students
- **November 2019,** Public Climate School Week at Uni Leipzig

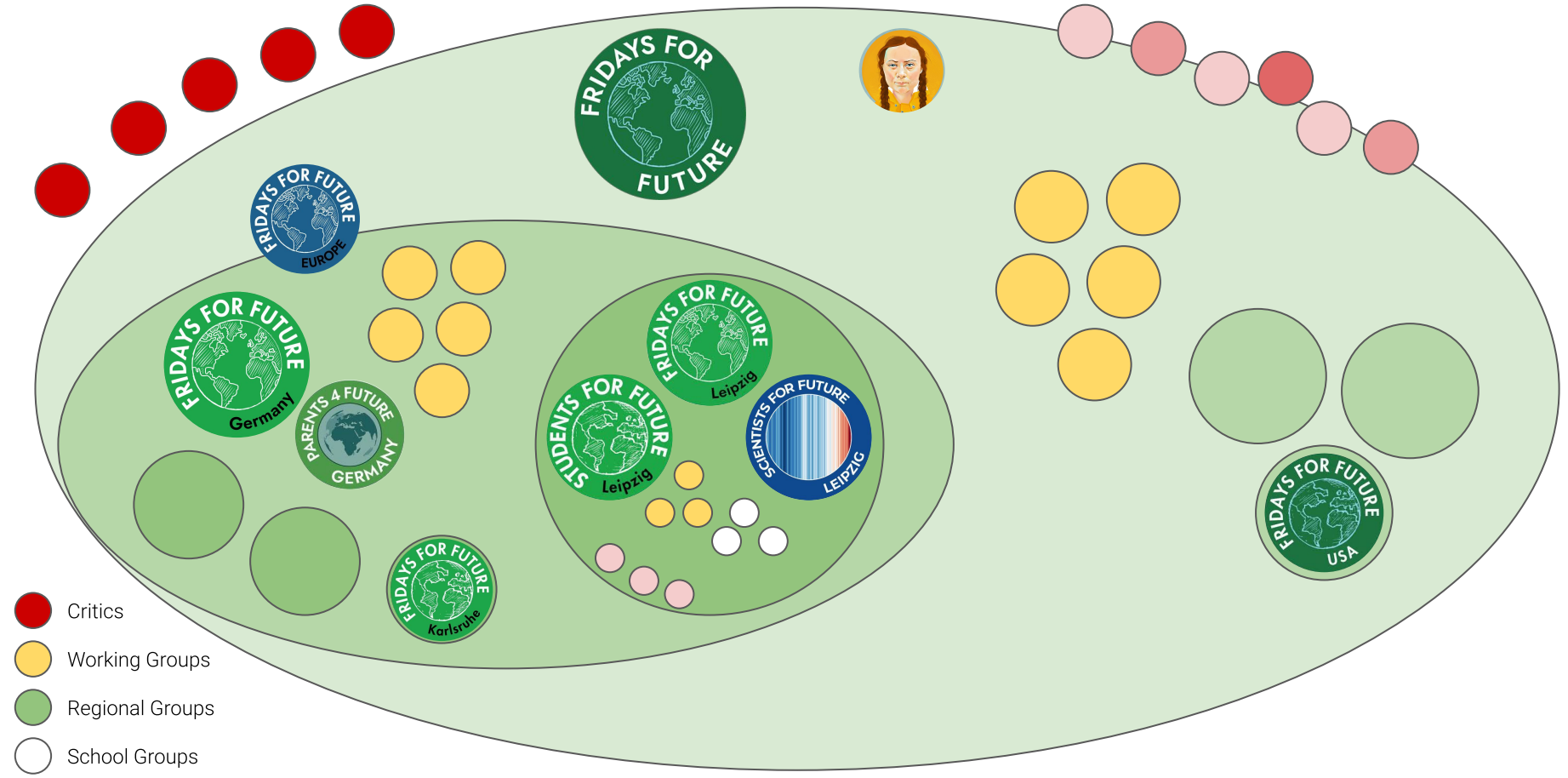
# Leipzig For Future

- Project Goals:
  - To explore if Prosocial research can help Fridays for Future groups work more effectively towards addressing climate change
  - To better understand the diversity of values and goals of Fridays for Future supporters and critics
- Exploratory Research Questions:
  - What do members of our lab already know or think about F4F groups?
  - How strongly do different stakeholders identify as supporters or critics of F4F?
  - What do different stakeholders think about the efficacy of F4F groups?
  - What do different stakeholders think F4F groups could do to be more effective?

# Leipzig For Future

- Methods
  - Survey of publicly available information (websites and articles)
  - Semi-structured focus group discussions and questionnaire within lab group
  - Exploratory questionnaire to (n=...) students, teachers, partners
  - Participant observation and semi-structured / unstructured interviews

# Social Structures in the For Future Movement(s)



# Leipzig For Future

- Early findings re: moral diversity and cooperation dynamics in F4F
  - Reports of social conflict at regional and national F4F organization
    - Use of shared resources (e.g. German F4F bank account)
    - Legal identity and organization in Germany
  - Diversity of opinions on ethics or efficacy of school strike as driving mechanism
    - Diversity of school level responses (Productive to Counter-Productive)
  - Purpose as protest “vs.” Purpose as networked action
  - School absence as motivating “cheaters” (real or perceived)
  - Difficult to learn about stakeholders who might be opposed to F4F
  - Unknown mechanisms for F4F relations to other groups which may or may not be supported by F4F members (e.g. XR)

# Leipzig For Future

- Future directions
  - Exploration of potential of “Frei-Days for Future” model of school integration and educational innovation (see here: https://educators4future.org/wp-content/uploads/2019/09/FREI-Day.pdf)
  - Exploration of community science toolkit to strengthen cooperation and social learning across “for Future” movements
  - Exploration of community science toolkit for exploring cooperation and psychological flexibility around climate actions within a school community

# Outlook for the Community Science Lab

- Development of the **Community Science Handbook** for methodological and project planning supports
- **Exploration** of value potential in
  - German Primary School “Sachunterricht” teaching area
  - School gardens
  - School and classroom governance
  - Civic/democracy education
  - Ethics education and moral discourse
  - Community forestry education in Tanzania
- Working towards “**Networked Improvement Communities**” of local educators focused on specific contexts of application

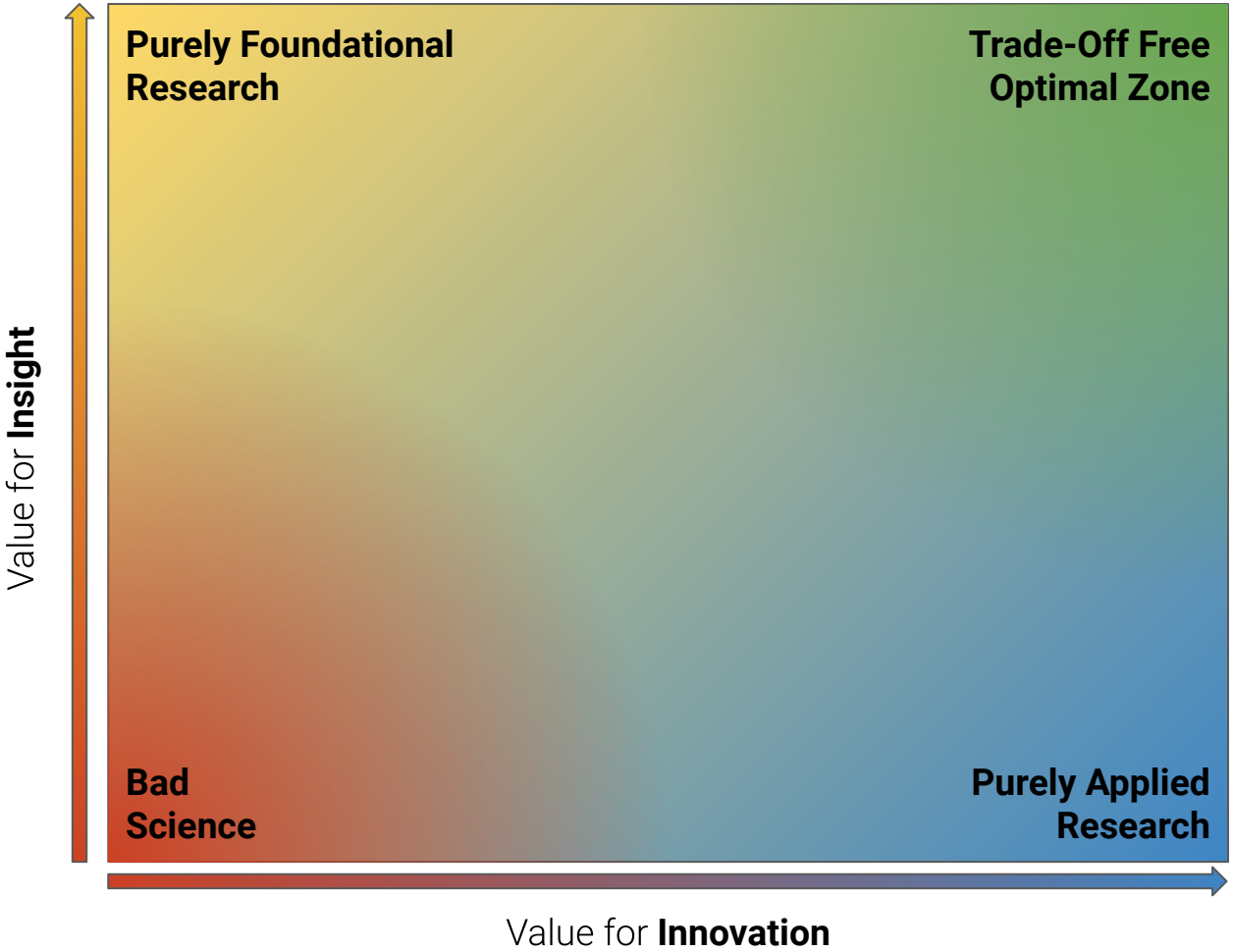
# Outlook for the Community Science Lab

- Challenges
  - **Theoretical disconnects** across evolution, behavior, and sustainability science education research communities
  - Selection pressure for **disciplinary teaching** (interdisciplinary teaching is itself a cooperation dilemma to be solved!)
- Needs
  - New generation of **interdisciplinary teachers** and **researchers** focused on using our collective understanding of the human condition to drive metacognition and effective action towards more desirable futures!

# Outlook for the Community Science Lab

- Implications for childhood and comparative research?
  - Re-think relationship between foundational and applied research?
  - Organize foundational research priorities around sustainability-relevant traits?
  - Institutionalize feedback loops from foundational insights about the human condition into opportunities for classroom learning?
  - Systematic educational outreach as part of social responsibility of the science community?

# Thank you for your attention!


Purely Foundational Research
Trade-Off Free Optimal Zone
Bad Science
Purely Applied Research
Value for Insight
Value for Innovation