universität freiburg

Allgemeine Psychologie
Cognition, Action, Sustainability

Introduction of our team – who is who and is interested in which type of reserach

Master of Psychology

Andrea Kiesel
Freiburg, 13. Oktober 2023

Introduction

Allgemeine Psychologie
Cognition, Action, Sustainability

Prof. Dr. Andrea Kiesel

- Research profile
  - Cognition, Action, Sustainability
  - Action Control, cognitive and motivational aspects of action, Human-machine interaction
  - Multitasking

- Teaching
  - Cognition (Perception, Attention, Memory, Problem Solving)
  - Emotion, Motivation, Learning,
  - Scientific Concepts and Methods

Introduction

Teaching in Master program

- Basic research focus: Cognition and Action:
    - Multitasking
- Skills
- Colloquium (for 3rd semester)

- Application oriented psychological science: Sustainability and Behavior:
    - Sustainable Behavior
- Lecture Cognition and Action

Time-based expectancy

Roland Thomaschke, Ezgi Özoglu
Alejandra Rodríguez

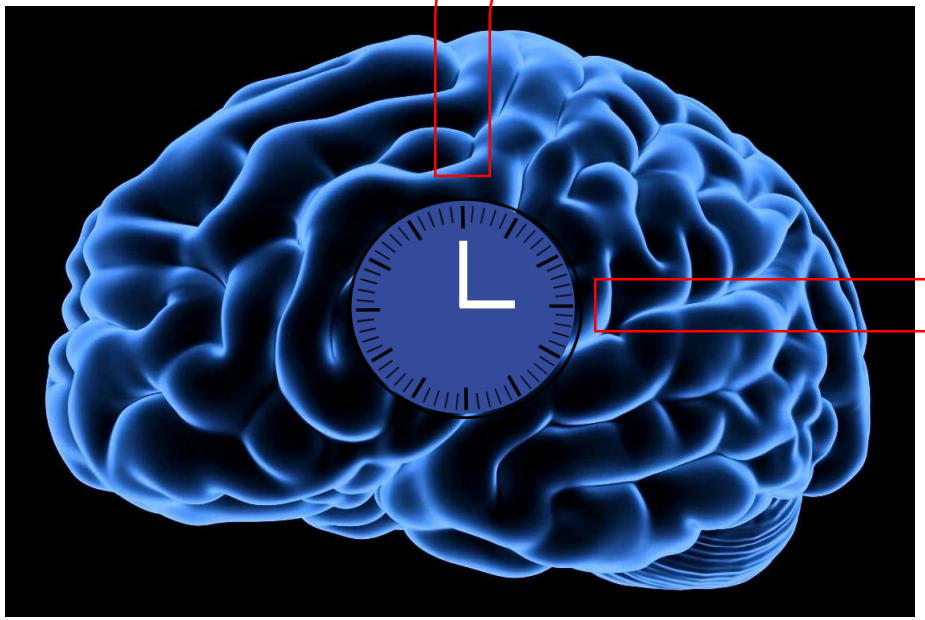
Allgemeine Psychologie

Raum HS 1005, roland.thomaschke@psychologie.uni-freiburg.de

Roland Thomaschke

NON-TEMPORAL INFORMATION

What to do?



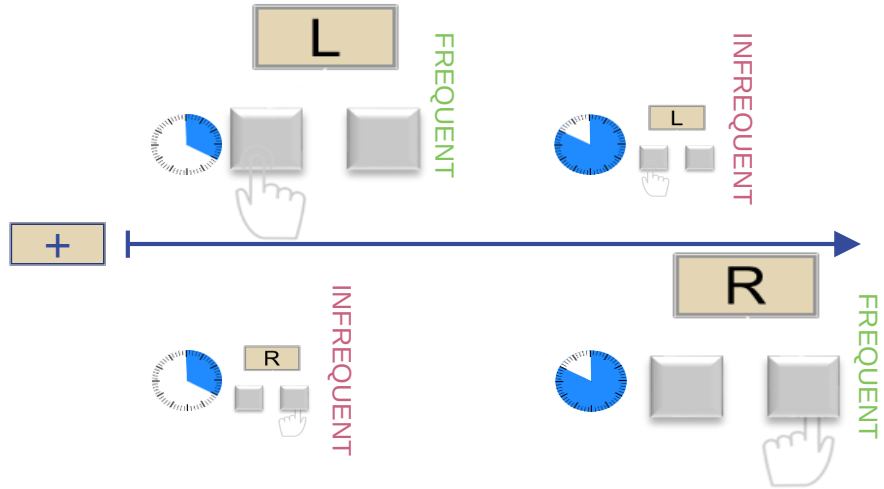
TEMPORAL INFORMATION

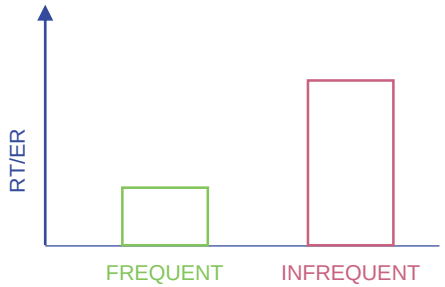
How long is it?

When to act?

Alejandra Rodríguez, M.Sc

- Temporal expectancy across sensory modalities and its impact on multitasking.

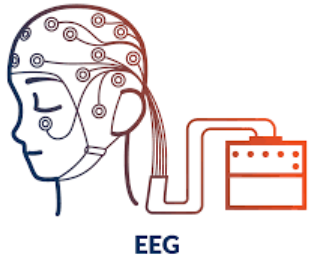


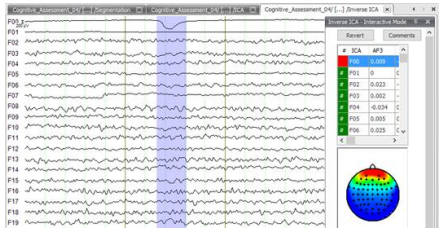


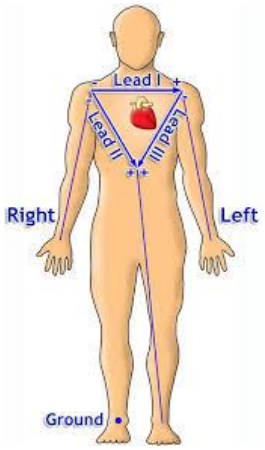
Electrophysiological Markers of Timing & Time Perception

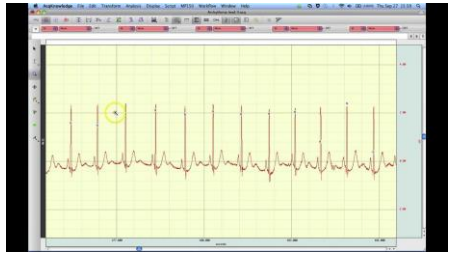
[Ezgi Özoğlu, MA]

- Timing Mechanisms and EEG
- Timing mechanisms and EKG









Behavioral measures of timing with simultaneous EEG or EKG recordings

Research Focus

- Can we track time-based decisions in the brain considering:
    - motivational state
    - emotional state or attentional bias
    - temporal context
    - metacognitive state
- Can heart-rate variability explain altered perception of time considering:
    - motivational state
    - individual differences (i.e., personality traits, anxiety)
    - emotional state or attentional bias

actual time

perceived time

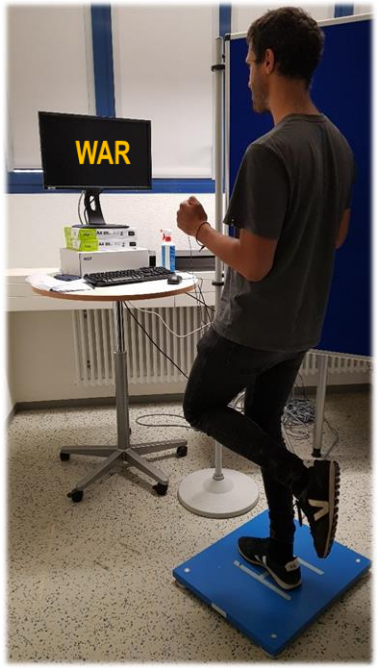
Cognitive – Motor Interference

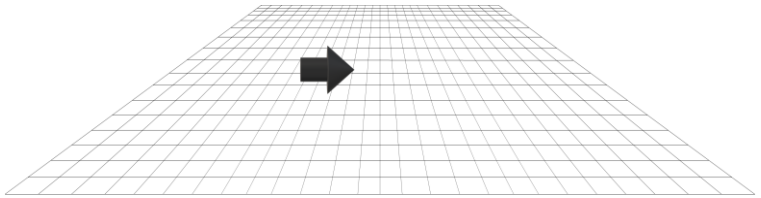
Elisa Straub
elisa.straub@
psychologie.uni-freiburg.de

Raphael Hartmann
Raphael.Hartmann@
psychologie.uni-freiburg.de

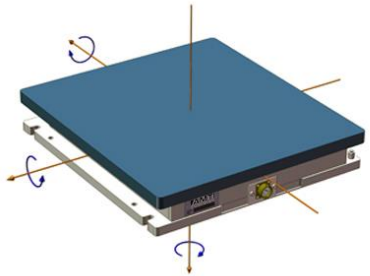
Cross-talk between cognition, emotion and balance control

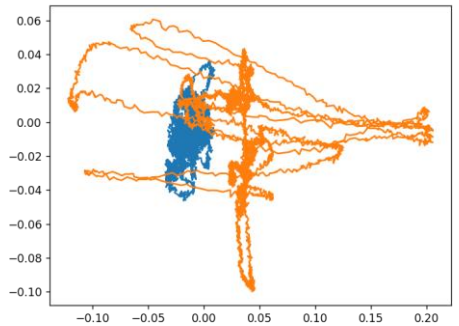
Elisa Straub





How cognitive conflict and emotional information impact balance ability?

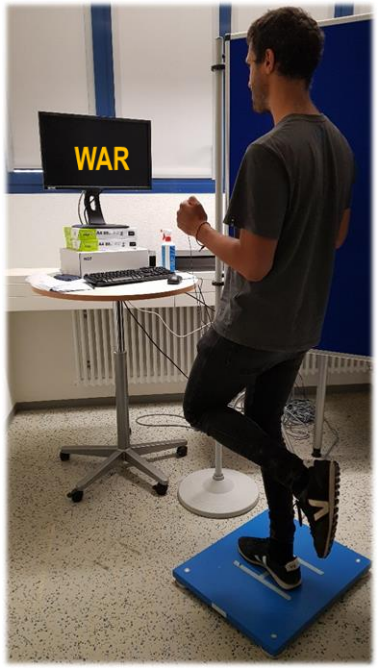


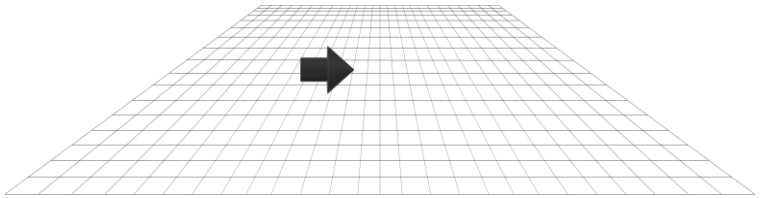


How different body positions affect cognitive abilities and processing of emotional information?

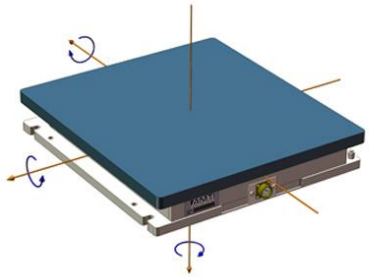
Data analyses of cognitive tasks and balance control

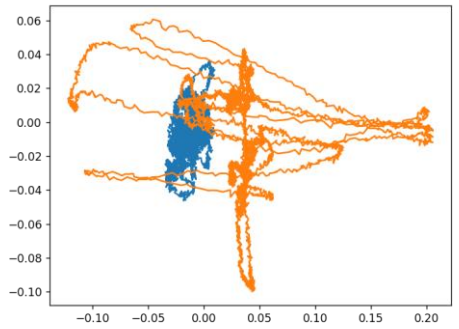
Raphael Hartmann





Modelling of cognitive processes, e.g. MPT + RT





R-package for Processing Force-Plate Time-Series Data

Walking and Talking

Walking on gait analysis mat
→ gait parameters

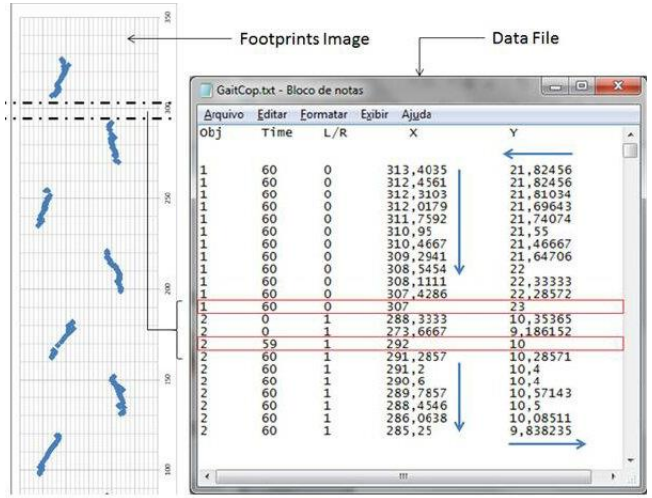
Dual Task

Counting backwards
→ cognitive performance

Advance methodological approaches for dealing with a rich pool of data on interferences of a motor- and a cognitive task

Elisa Straub

Tian Zhou



universitäre altersmedizin felix platter

Katja Pollak, M.Sc.

- PhD student in GRK „*Statistical Modeling in Psychology*“
- Research interest:
  - Statistical modelling of cognitive tasks, drift diffusion models
  - Physical activity
  - Impact of physical activity on cognitive performance

- contact:
  - katja.pollak@psychologie.uni-freiburg.de

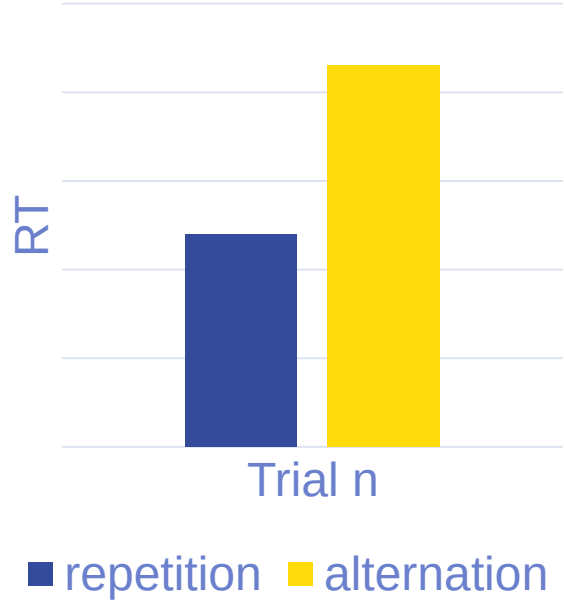
Sequential effects, human-machine interaction & recognition memory

Anne Voormann

anne.voormann@psychologie.uni-freiburg.de

Sequential effects across paradigms

- *Sequential effects*: Performance gains in case of a repetition between trial *n*-1 and trial *n* compared to an alternation
- Observed in many paradigms; e.g.,
  - Two-choice RT → response category
  - Visual search → target dimension
  - Task-switching → task-sets
  - Interference → congruency



- Sequential effects have been investigated – so far – mostly in their respective sub-disciplines (but see Frings et al., 2020)

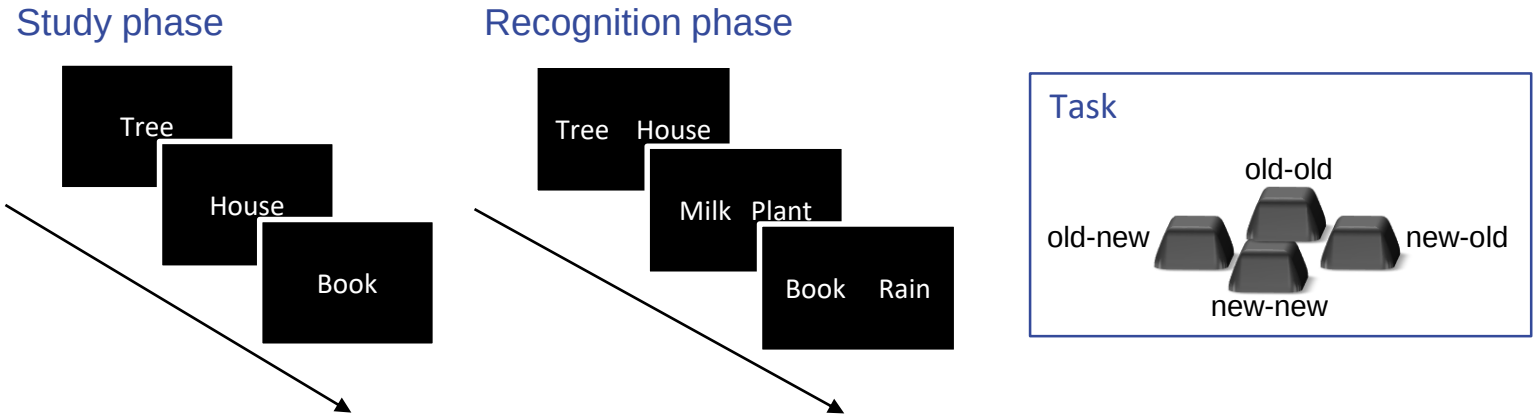
➢ **Do sequential effects of various paradigms share common mechanisms?**

➢ **Which mechanisms are unique to specific task demands?**

Recognition memory

- *Recognition*: Ability to distinguish between previous encountered situations and new situations

- **Which processes are involved in recognition decisions (recognition errors)?**
  - Do some recognition errors occur based on misleading memory evidence?
  - Do some recognition errors represent simple guessing?
  - How do recognition decisions interact when two objects are encountered simultaneously?



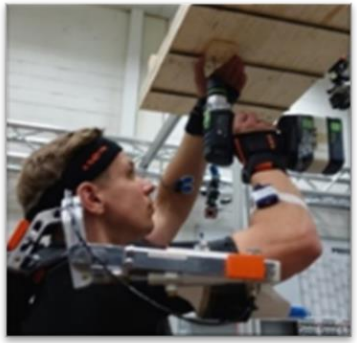
human-machine interaction

Anne Voormann
anne.voormann@
psychologie.uni-freiburg.de

Alejandra Rodriguez
alejandra.rodriguez@
psychologie.uni-freiburg.de

Human-machine interaction

- Optimization of human performance and aspects of psychological experience, e.g.
  - Sense of Agency
  - Flow
  - Sense of Body Ownership
  - Acceptance, Trust, Security



→Interdisciplinary research with e.g. engineers, information science (Karlsruher Institut für Technik)

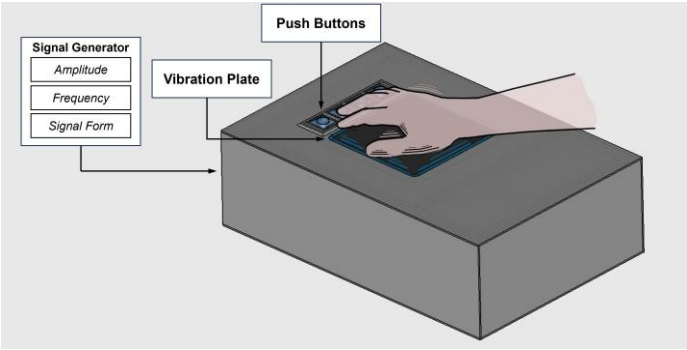
Karlsruher Institut für Technologie

Impact of hand-arm vibration on cognition

- In many cases hand-arm vibration cannot be avoided nor can the activities be replaced by other technologies (e.g., grinding, drilling)
- But especially in those cases, it is essential for the craftsmen to be attentive in order to avoid accidents or damages

➢ **How is cognitive performance influenced when participants experience at the same time hand-arm vibration?**

a) Which type of vibration has an effect on the performance in cognitive tasks?
b) How does vibration comfort and discomfort effect performance in cognitive tasks?
c) Does the experience of hand-arm vibration increase the perceived task difficulty and thus impacts the choice behavior in self-organized task-switching?

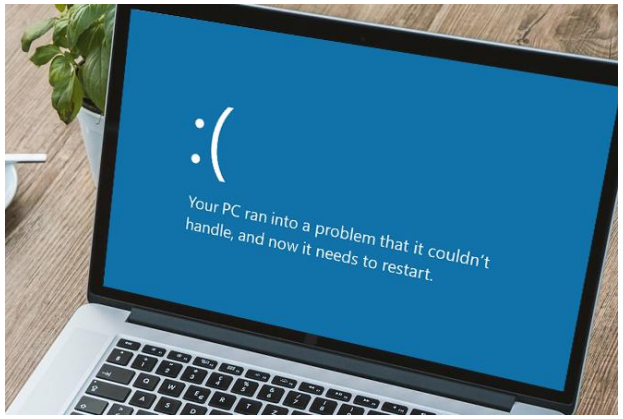


Self-Organized Task Switching

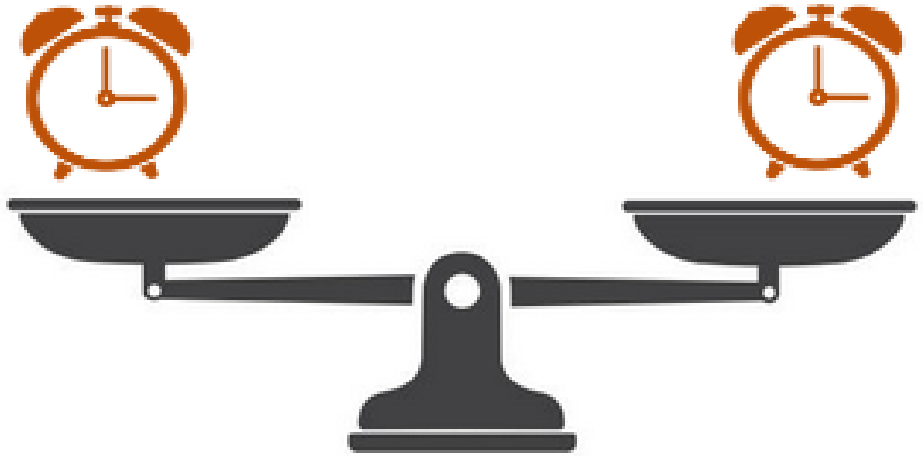
Irina Monno
irina.monno@psychologie.uni-freiburg.de

Self-Organized Task Switching

Individuals balance different types of temporal costs to optimize self-organized task switching.



limited cognitive abilities when faced with multiple task requirements ⟶
cognitive time costs



delayed task availability ⟶
environmental time costs

Self-Organized Task Switching: Cognitive mechanisms and beyond

- Exploration of different cost-balancing strategies
- Individual differences in task selection behavior, i.e. cost-balancing strategy
- Costs-balancing and individual determinants: time estimation ability, working memory,…
- Switch cost as reliable measurement for multitasking ability
- Relationship between subjective preference for task switching (polychronicity) and objective measurements (switch costs, task switching frequency)
- Self-organized task switching in real-world scenario (see presentation of the Department Business Psychology)

Research on the potential effects of a basic income on cognitive (control) processes

Larissa Walter

(employed at the Freiburg Institute for Basic Income Studies - FRIBIS)

Research Question and Everyday Life

Research Question: (How) does money/ a reward given noncontingent on performance in an experimental (laboratory) setting influence cognitive control processes?

Relevance for Everyday Life? Do people remain more focused on a task (e.g., hobbies, jobs, etc.), or do they change tasks more frequently when receiving a basic income (BI)? Do people work more efficiently when receiving a BI compared to being paid based on their work performance? … and way more

My Projects

Project 1: Systematic Review of the current research status on the effects of noncontingent reward on cognitive control processes. (Which paradigms were utilized? What are the outcomes? …)

Project 2: Non-Contingent Reward within the Self-Organized Task Switching Paradigm

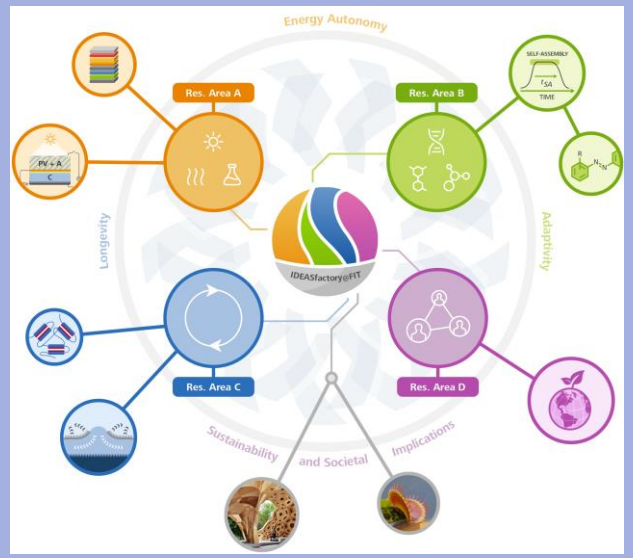
(How) does noncontingent reward in a self-organized task switching experiment affect the task selection behavior (repetition or switch tasks), error rates, or reaction time (in comparison to when no reward or performance-contingent reward is provided)?

Project 3: … to be prepared (in more detail) …

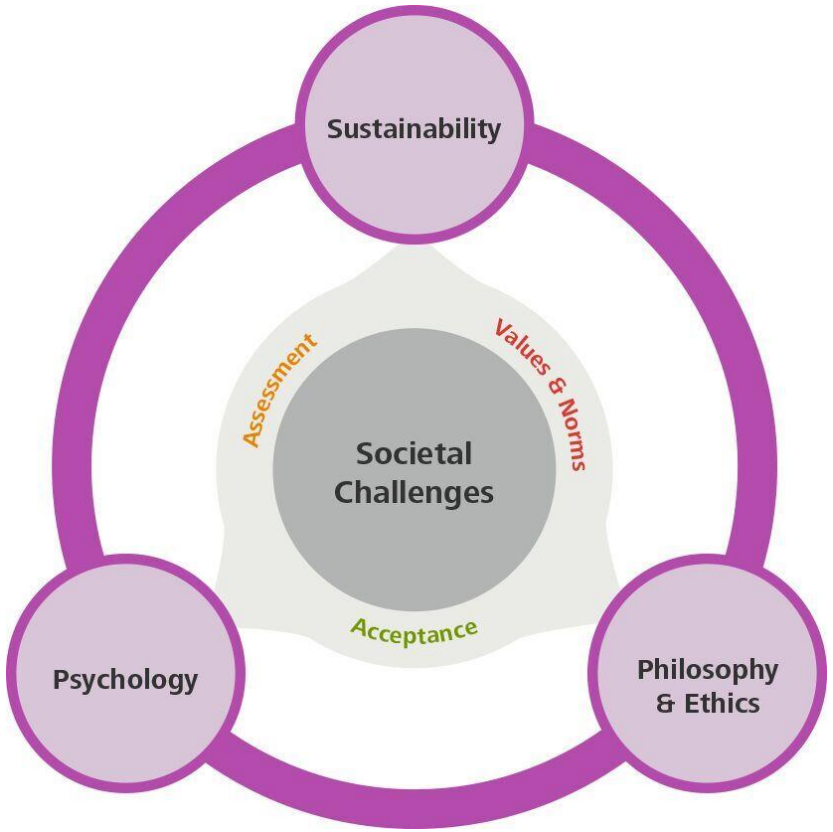
Acceptance of bio-inspired technologies –

research in the excellence cluster „Living, Adaptive and Energy-autonomous Materials Systems”

livMatS
Living Materials Systems



*liv*MatS Research Area D - Challenges Addressed

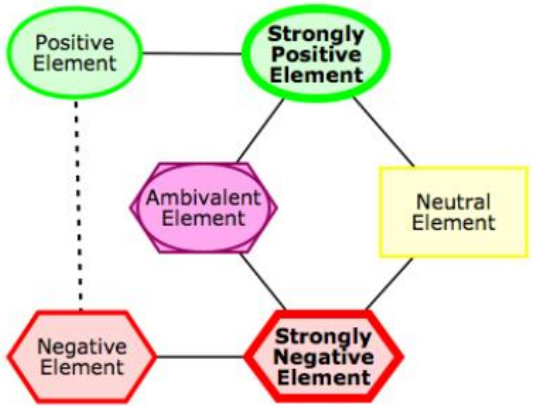


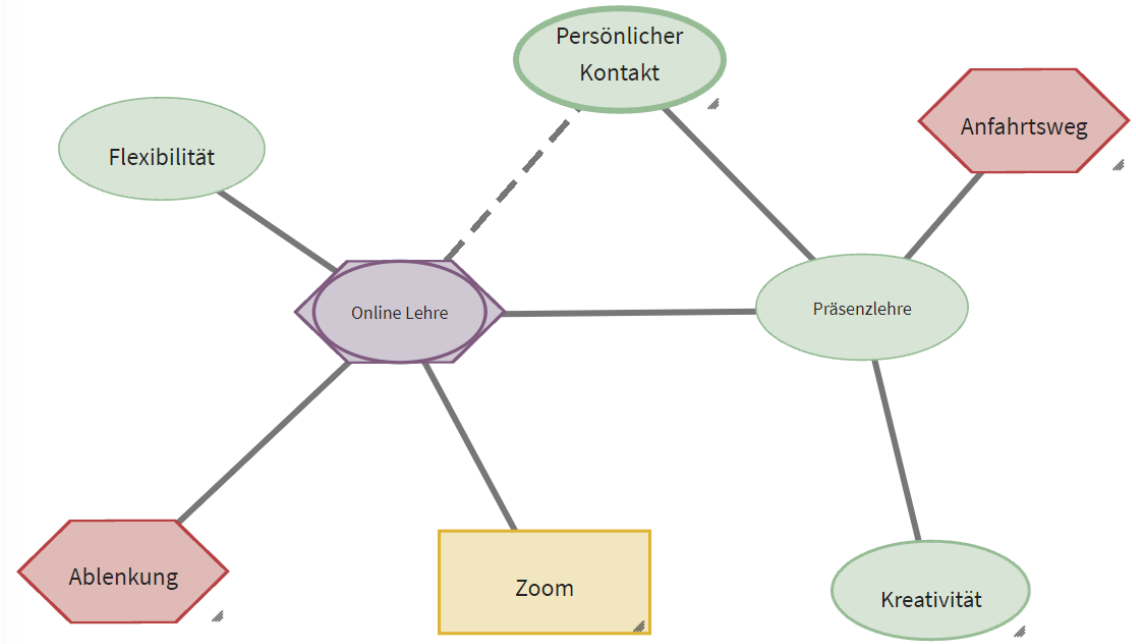
- Assessment, systematization and reflection of life-like attributes.
- Analyze living materials systems from
  - a socio-scientific,
  - sustainability-oriented,
  - psychological and
  - philosophical point of view.
- Contemporary and conjoint approach to inform and guide development.

Cognitive-Affective-Mapping (CAM)

Cognitive-Affective Maps (CAMs)

- Mind mapping approach with affective assessment of concept nodes
- Quantitative and qualitative data analyses





Current work (including Master thesis):
https://www.psychologie.uni-freiburg.de/abteilungen/Allgemeine.Psychologie/research/cam-research/

CAMs as a mixed method tool

Dr. Lisa Reuter

Qualitative

- Reconstructing Social Relations
- Theory Building
- Hermeneutic
- Holistic
- Individual Experiences
- Observations
- Interviews

Quantitative

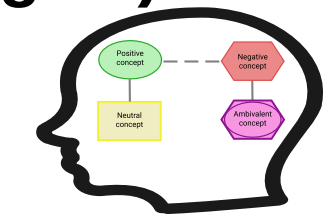
- Hypothesis Testing
- Standardized & Controlled Conditions
- Cause-Effect Relations
- Questionnaires
- Statistic
- Experiments
- Large Samples

Cognitive-Affective Maps

Development of methods to research emerging technologies (focus on climate technologies)

Julius Fenn

Cognitive-Affective Maps (CAM) Tools



- **Collect data** - Cognitive-Affective Map Extended Logic (C.A.M.E.L.): C.A.M.E.L. is an open-source software to draw CAMs with multiple customization options
- **Analyze data** - CAM-App: Using several modules, CAM data can be semi-automatically summarized and subsequently analyzed
- **Set up studies** - Dashboard: An administrative panel allows easy setup and configuration of CAM studies.

Ethics Scale of Technology Assessment

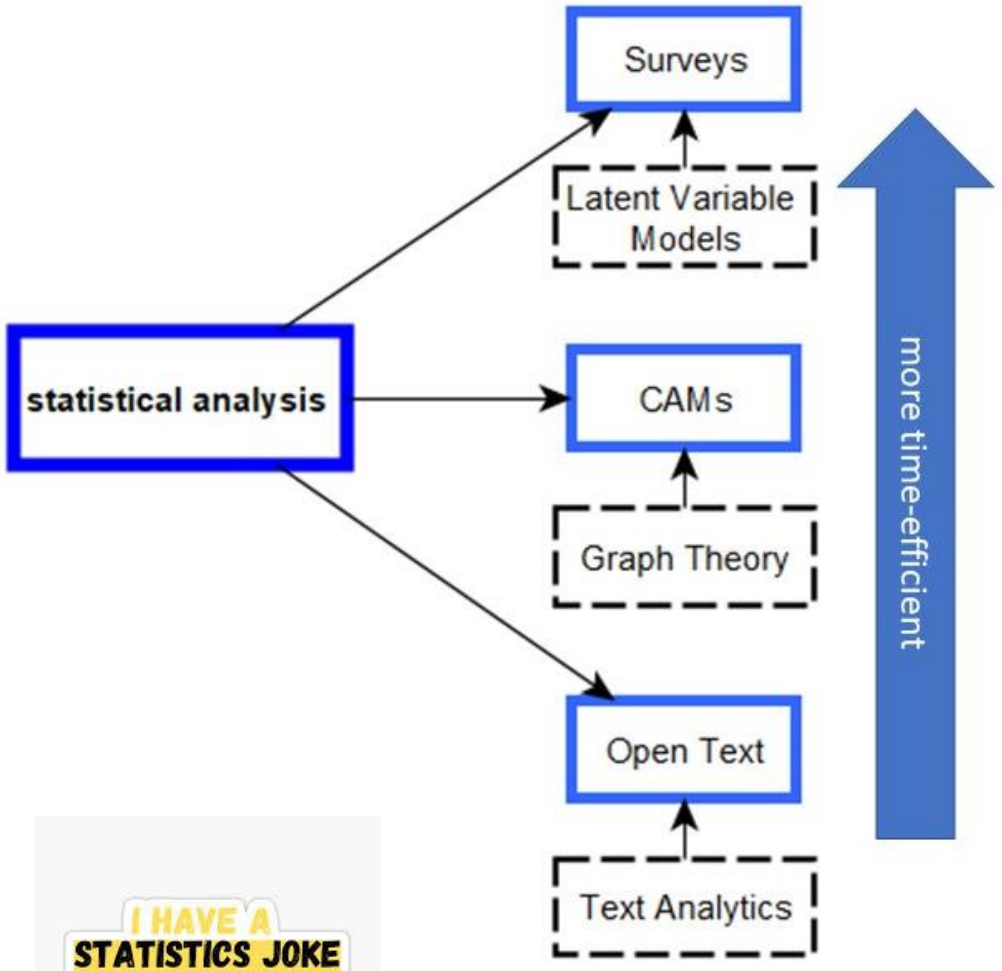
- Ethics scale includes multiple moral theories as we assume that, depending on the nature of the technology, different stakeholders might consider certain types of moral theories (or combinations of them) to be important
  - A total of 46 questions divided among 6 theories of ethics (deontology, utilitarianism, hedonism, virtue ethics, contractarianism, and relativism)

Combination of methods

Julius Fenn

Combination of several methods enables:

- conduct cost-effective, accompanying ethical evaluation for emerging technologies
- look at emerging issues from multiple perspectives to identify a wide range of concerns at an early stage
- *anticipatory governance* becomes possible, which aims to continuously improve the ability to deal with emerging technologies while there are still opportunities for adaptation



Conceptualizations of sustainability

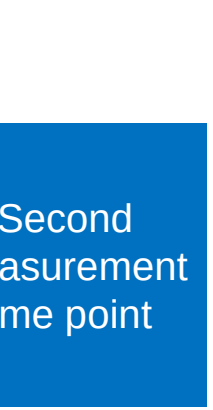
Michael Gorki

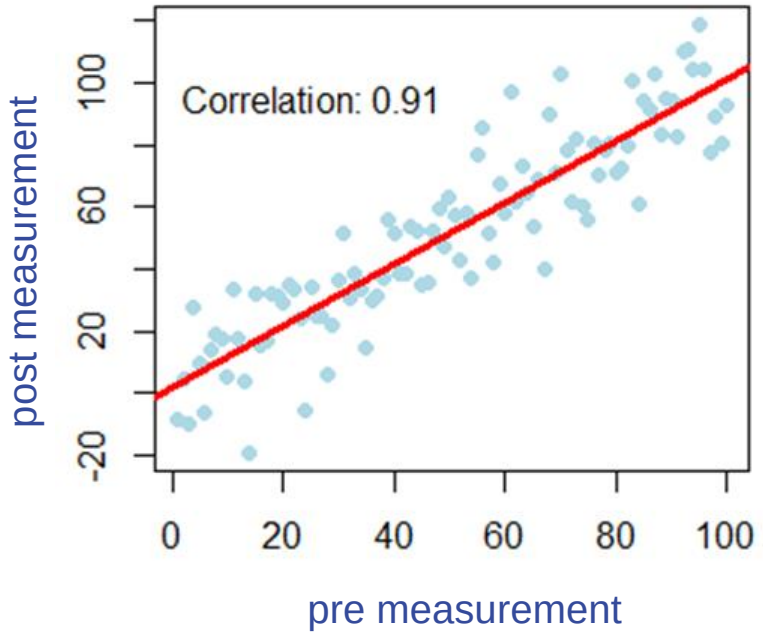
- **We know surprisingly little about how people conceptualize sustainability**
  - Which aspects of sustainability are…
    - …common ground or contested
    - …shared between „lay people“ and scientists
  - How do peoples' conceptualizations of sustainability compare to discourses in…
    - …sustainability theory
    - …mass media
  - How do people perceive the sustainability of bioinspired technologies?
- **Meta-level I‘m interested in**
  - Quantitative & qualitative approaches with CAMs, affective imagery, text(-corpus) based research
  - Interdisciplinarity (especially philosophy) & transdisciplinarity

Wilhelm Gros

(Improving) Reliability of Cognitive-Affective Maps

wilhelm.gros@
livmats.
uni-freiburg.de





contact

Prof. Dr. Andrea Kiesel

Allgemeine Psychologie

kiesel@psychologie.uni-freiburg.de

Angelika Massler

Allgemeine Psychologie

massler@psychologie.uni-freiburg.de