visuAAL

Privacy-Aware and Acceptable Video-Based Technologies and Services for Active and Assisted Living

The Acceptance of Artificial Intelligence in Health Related Contexts

Alexander Hick

Stockholm University

21.04.2023

Research Progress (ESR3)

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Universitat d'Alacant
Universidad de Alicante
Project Coordinator

RWTH AACHEN UNIVERSITY

Stockholm University

Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

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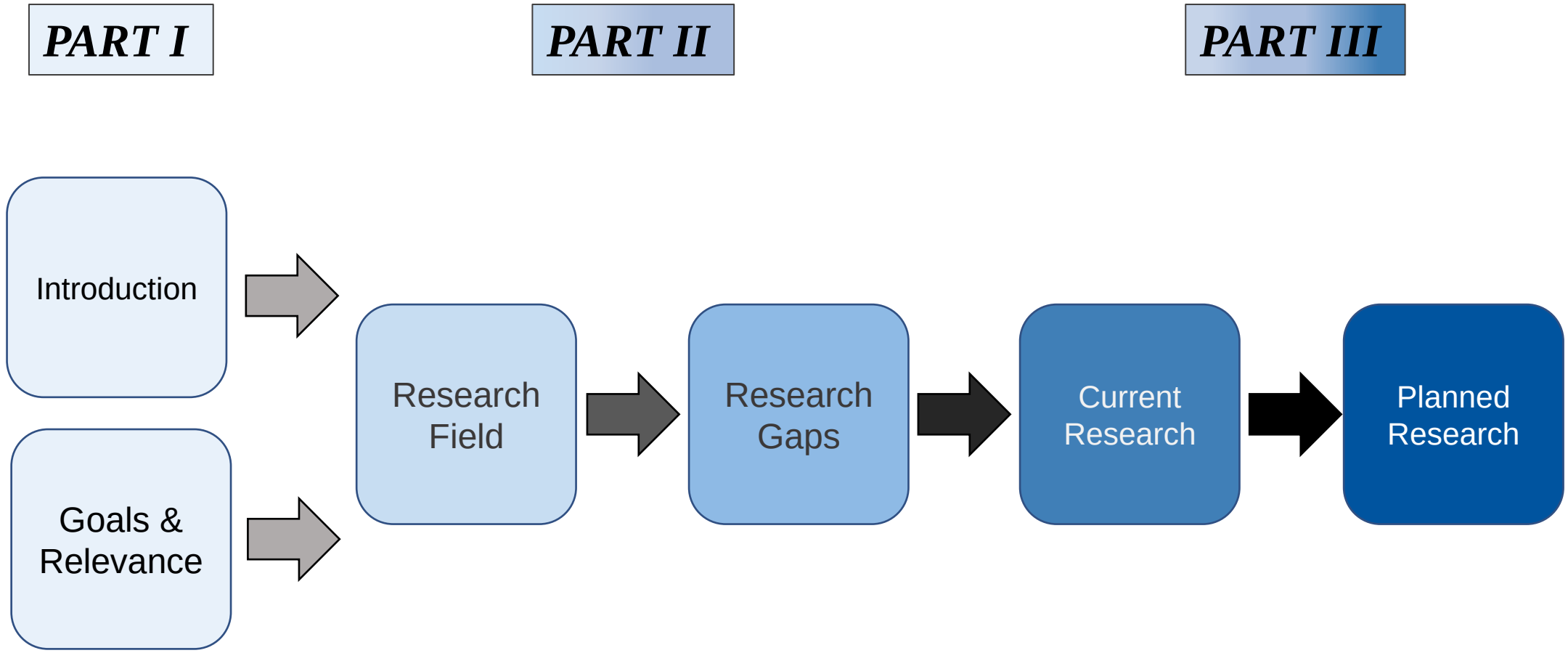

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Introduction

ESR 3. Alexander Hick – Introduction

Introduction

- **Why?** Acceptance is multifaceted variable and highly dependent on perception of e.g., AI
- **What?** Perception, attitudes, and associations regarding AI based AAL-technologies
- **Who?** Various target groups, including old & frail people, handicapped people, the general public & medical personnel
- **Where?** AI based AAL technologies, wearable or ambient-installed sensors in the context of home, health care, and hospitals
- **How?** Assessment of the perception, attitude, and acceptance of AI based AAL-technologies

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ESR 3. Alexander Hick – Goals & Relevance

Goals
&
Relevance

- Collection of knowledge, associations and attitudes towards AI
- Development of acceptance cartography for AI
- Holistic framework of user and context requirements

- Need for acceptance cartography for AI
- User perspectives in the development of AAL-technologies
- Implementation in all sectors of society

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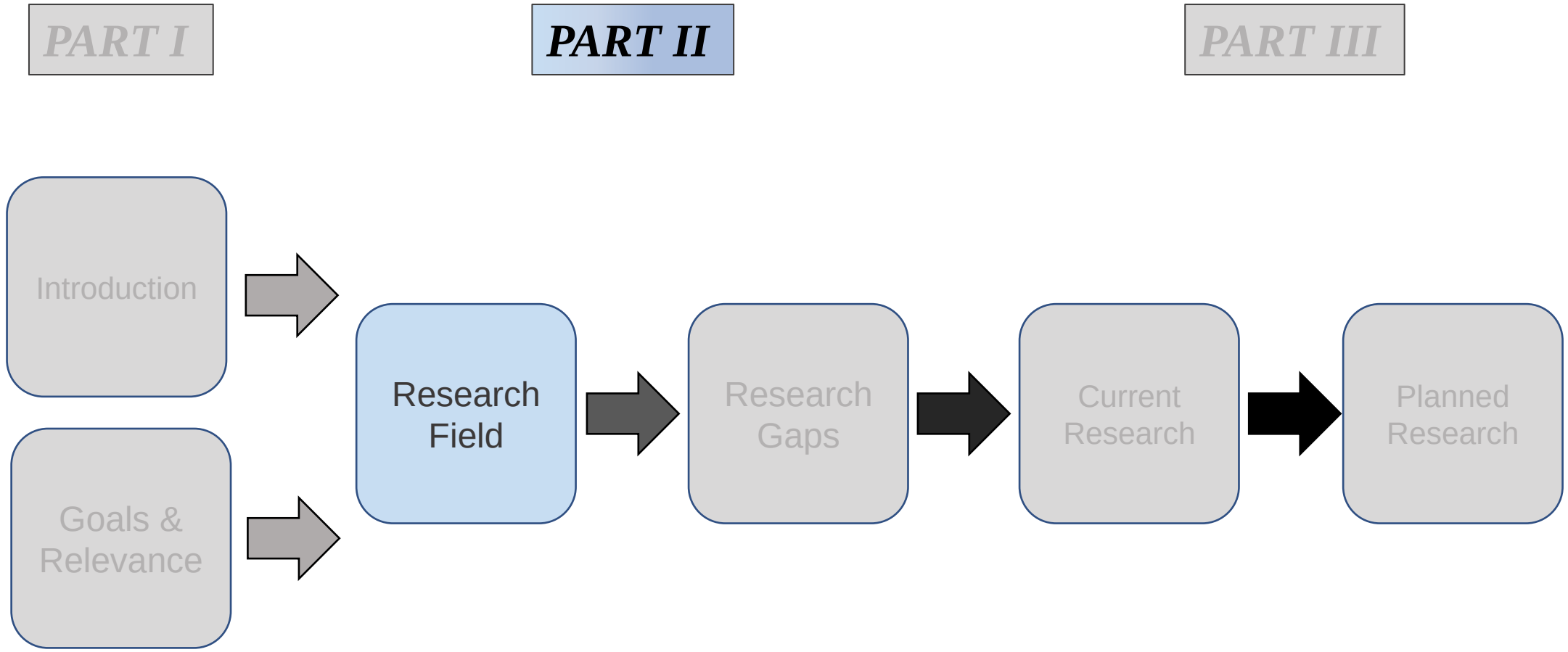

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The Research Field

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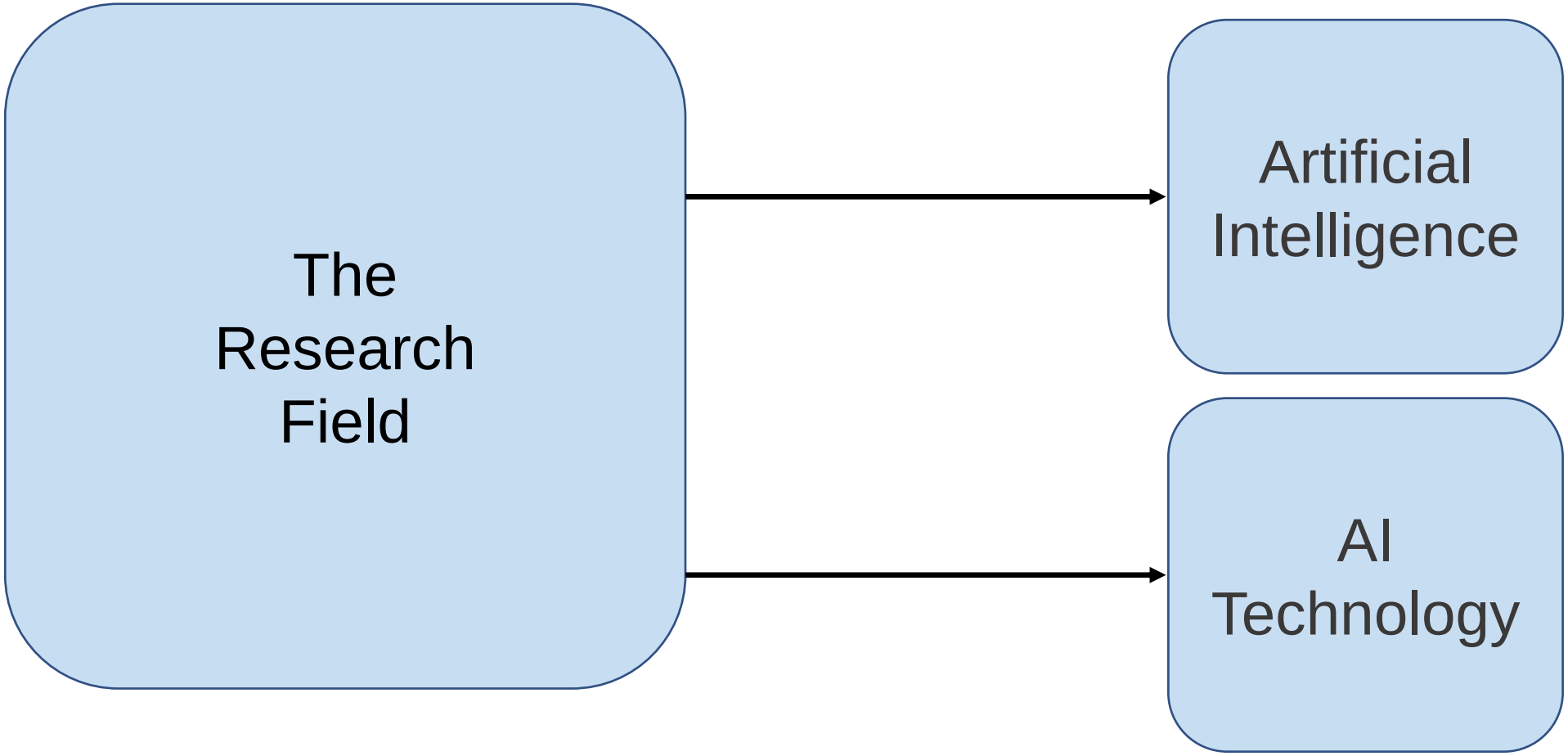

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ESR 3. Alexander Hick – The Research Field: Artificial Intelligence

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The Research Field

AI

- AI is **a term** coined by a group of computer scientists at the Dartmouth workshop on Artificial Intelligence
  (McCarthy, Minsky, Rochester & Shannon, 1955)
- Refers **to the ability** of a computer to perform actions commonly associated with human intelligence
  (Copeland, 1993)
- AI is the field of science in which we develop **technologies** that display certain cognitive tasks in an intelligent manner
  (Murphy et al., 2021)
- An essential feature of AI is large amounts of **data** with which **algorithms** can be trained in various desired (or undesired ways)
  (*Jobin, Ienca & Vayena, 2019; Chen et al., 2020; European Commission, 2021*).

ESR 3. Alexander Hick – The Research Field: AI-Technology

The Research Field

AI Tech.

- It is an **umbrella term** for technologies that can learn (Patterson, 1990; Murphy, 2021).
- AI-models and algorithms can be implemented in **everyday technolo**gy e.g., smartphones, cameras, and cars (Lecun, 2020).
- Also, they can be built into **medical technology** such as Ambient Assisted Living (AAL) systems (Jovanovic, 2019).
- Its complexity can lead to a **misunderstanding, bias, or fear** of the abilities of AI (Hick & Ziefle, 2022; Brauner, Hick, Philipsen & Ziefle, 2023).
- Or mistrust and **problems** in technology adoption (Zhang, 2020; Holzinger, 2019; Shin, 2021).

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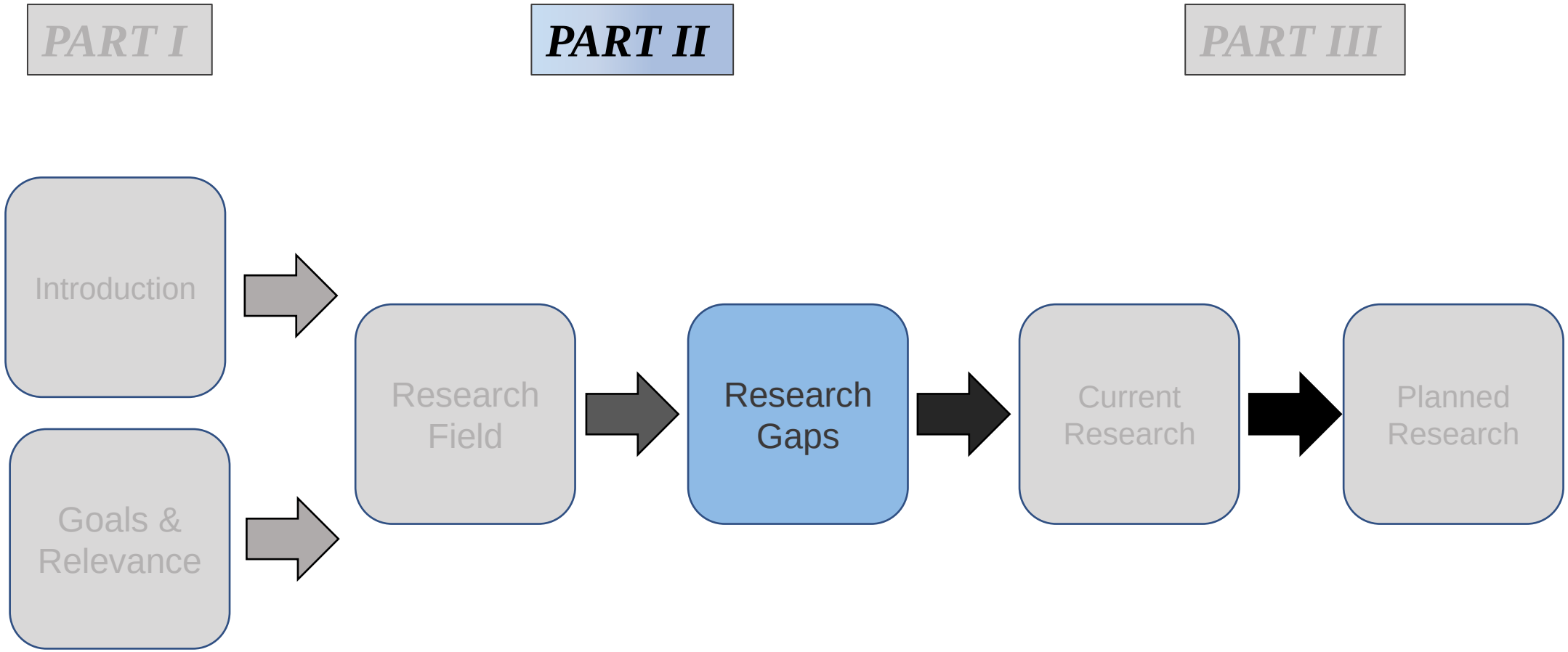

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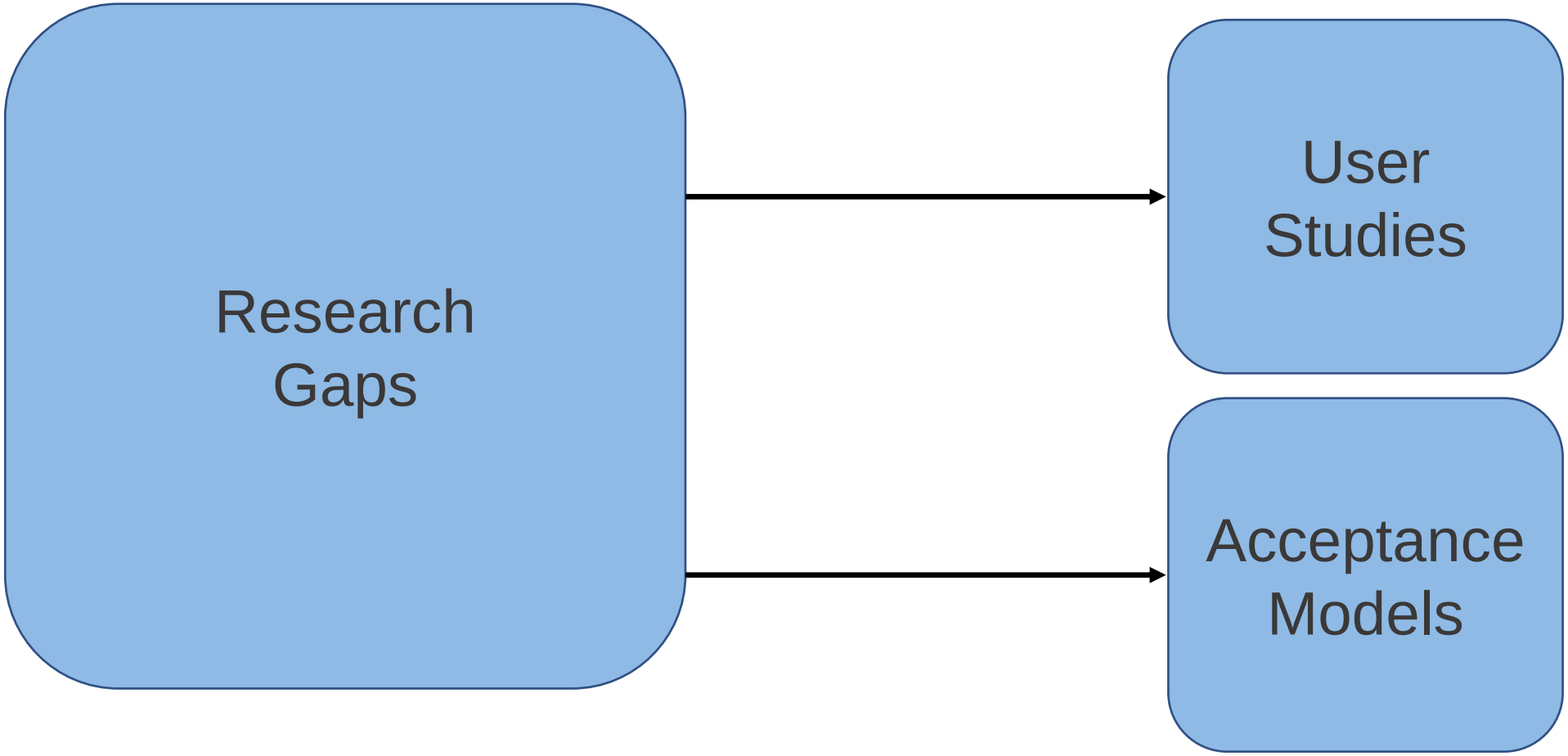

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ESR 3. Alexander Hick – Research Gaps

Research Gaps

A Qualitative Approach to the Public Perception of Artificial Intelligence

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ESR 3. Alexander Hick – *Sample*

Research Gaps

- Semi-structured interviews were conducted
  - N=32
  - Mean age: 43 years (SD = 10.43)
  - Age range: 23-83
  - 17 females & 16 males
  - The **research aim**:

RQ1 What do people **know** about AI?
RQ2 What **contact** do people have with AI?
RQ3 What do people **expect** of AI?

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ESR 3. Alexander Hick – *Guideline*

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What do you know about AI?

Where do you might have been in contact with AI?

What makes AI-Technology different from non-AI Technology

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Dystopian view

"It should definitely not be able to program itself! Power of the machines and whatnot…If you have watched Terminator, you surely wouldn't want that. If it is intelligent and develops a personality with own interests like: "I do not like asparagus", for example…this would be a problem." (Female, 46)

Utopian view

"Well, an AI can do it perfectly. Something humans can't…it's what it is. These many facets could not be represented by the human mind, let alone summarised in such a way that gives you a perfect output…evidently…humans can't.' (Female, 58)

ESR 3. Alexander Hick – The Research Gaps

Research Gaps

- Two years ago, the European Commission (EC) revised the *Coordinated Plan on Artificial Intelligence (EC, 2021)*
  - A set of goals and recommendations for the development and uptake of AI in the European Union.
  - One of its key policy objectives is to '*ensur[e] that **AI works for people** and is a **force of good in society**'* (EC, 2021, p.26).

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ESR 3. Alexander Hick – The Research Gaps

Research Gaps

- However,…
  - The EC, (also) acknowledges that the general public might **not be able to '*fully understand the workings and effects of AI systems*'**

    (EC: AI ethics guidelines, 2021, p.23, brackets and emphasis added)

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ESR 3. Alexander Hick – The Research Gaps

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Research Gaps

- Increased development in the field of AI:
  - Improved **Generative Pre-trained Transformers** (GPTs)
    - E.g., ChatGPT, GPT4 (OpenAI, 2023)
- Need for **updated AI-guidelines**
  - Especially for GPTs (Sanders, 2023)
- In addition, fill the **research gap** between **technology development** and **user adoption**

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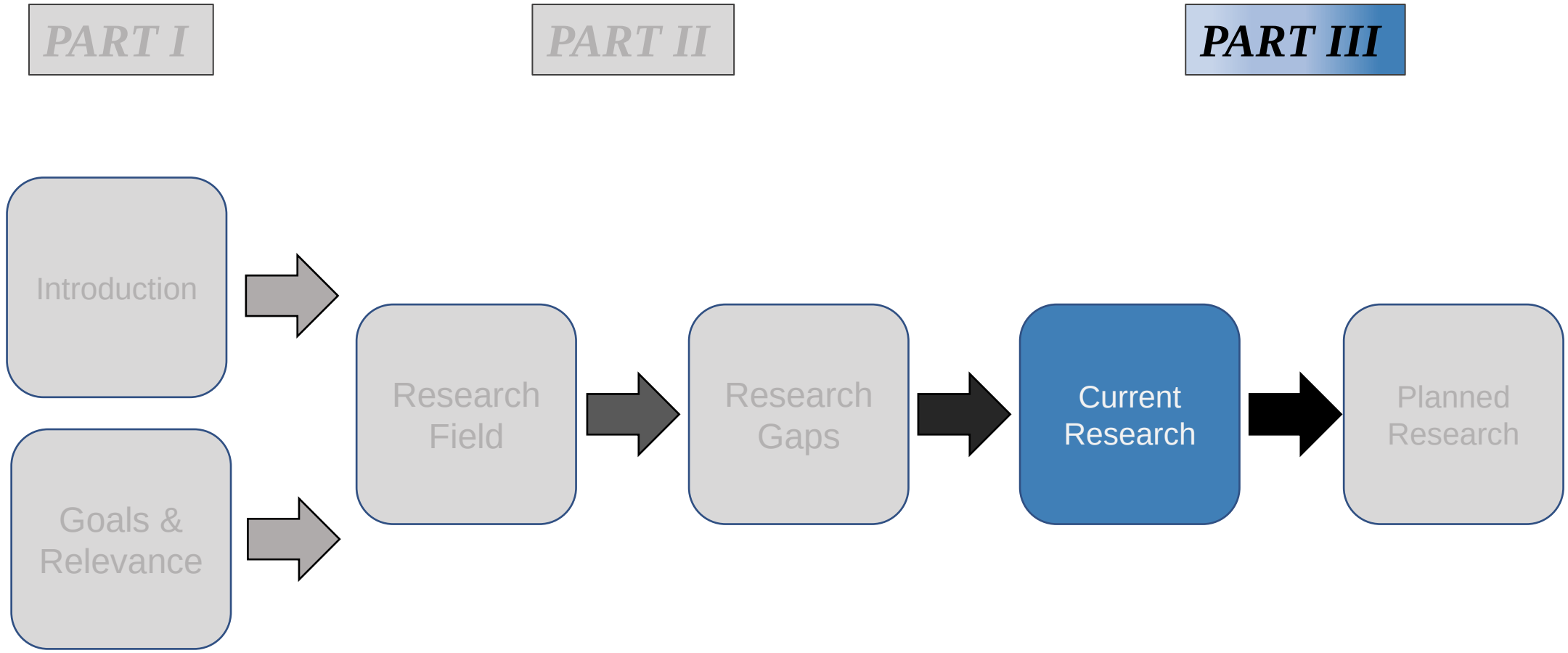

ESR 3. Alexander Hick – Current Research

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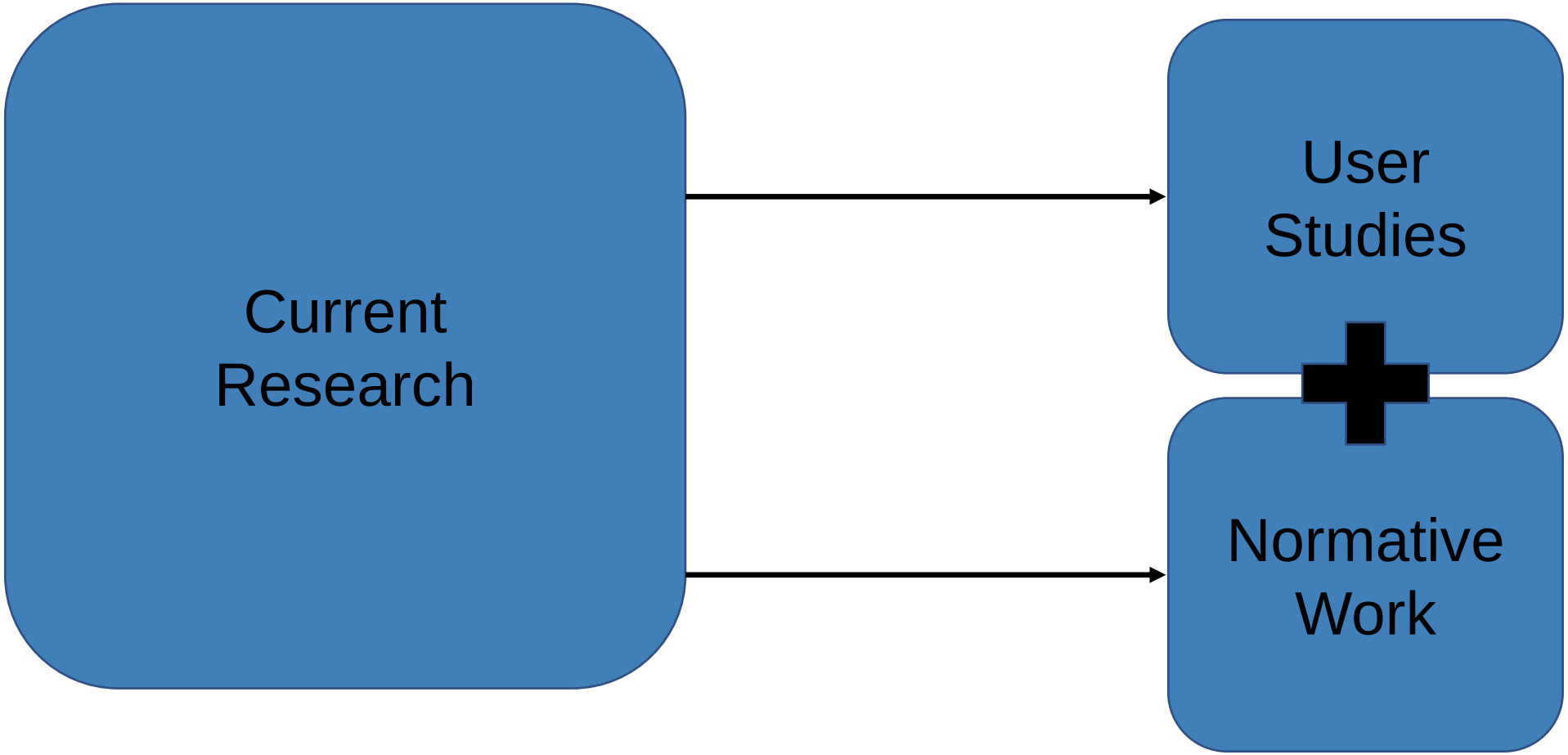

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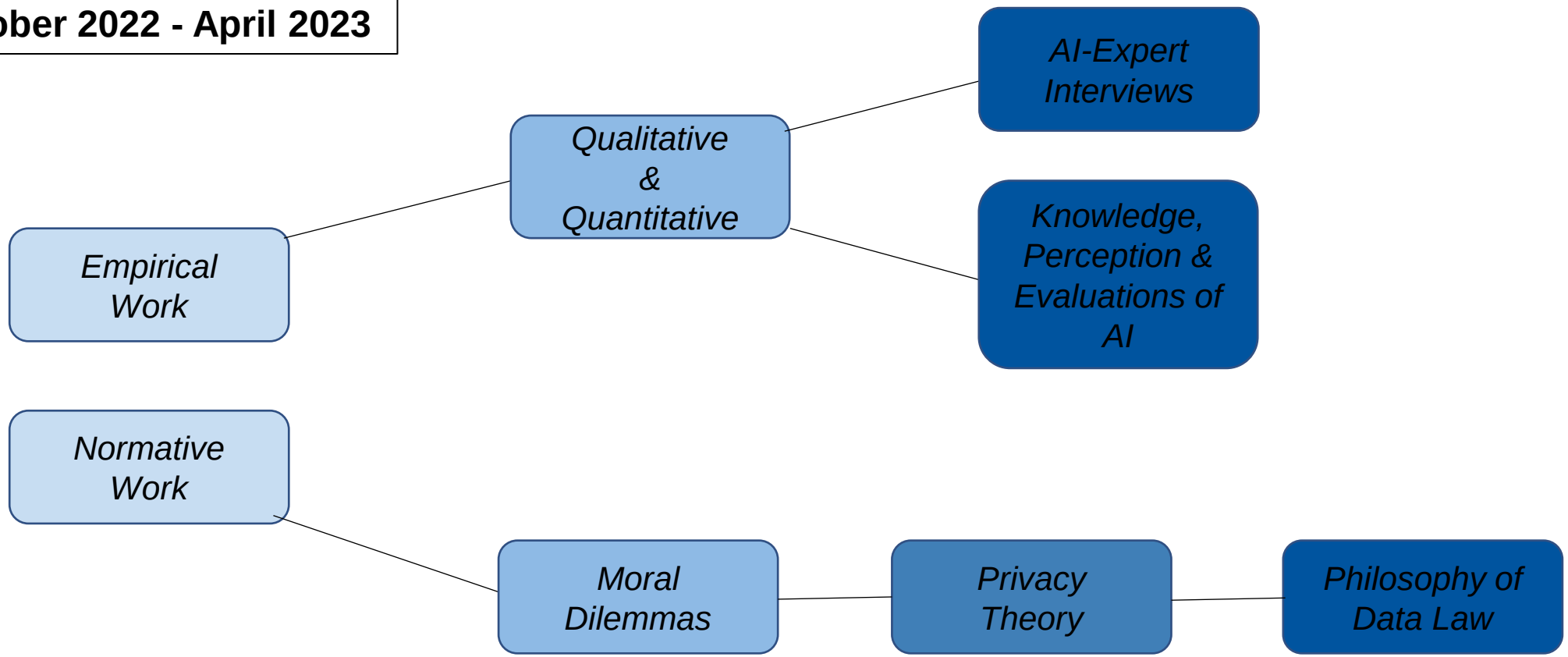
Timeframe:
October 2022 - April 2023



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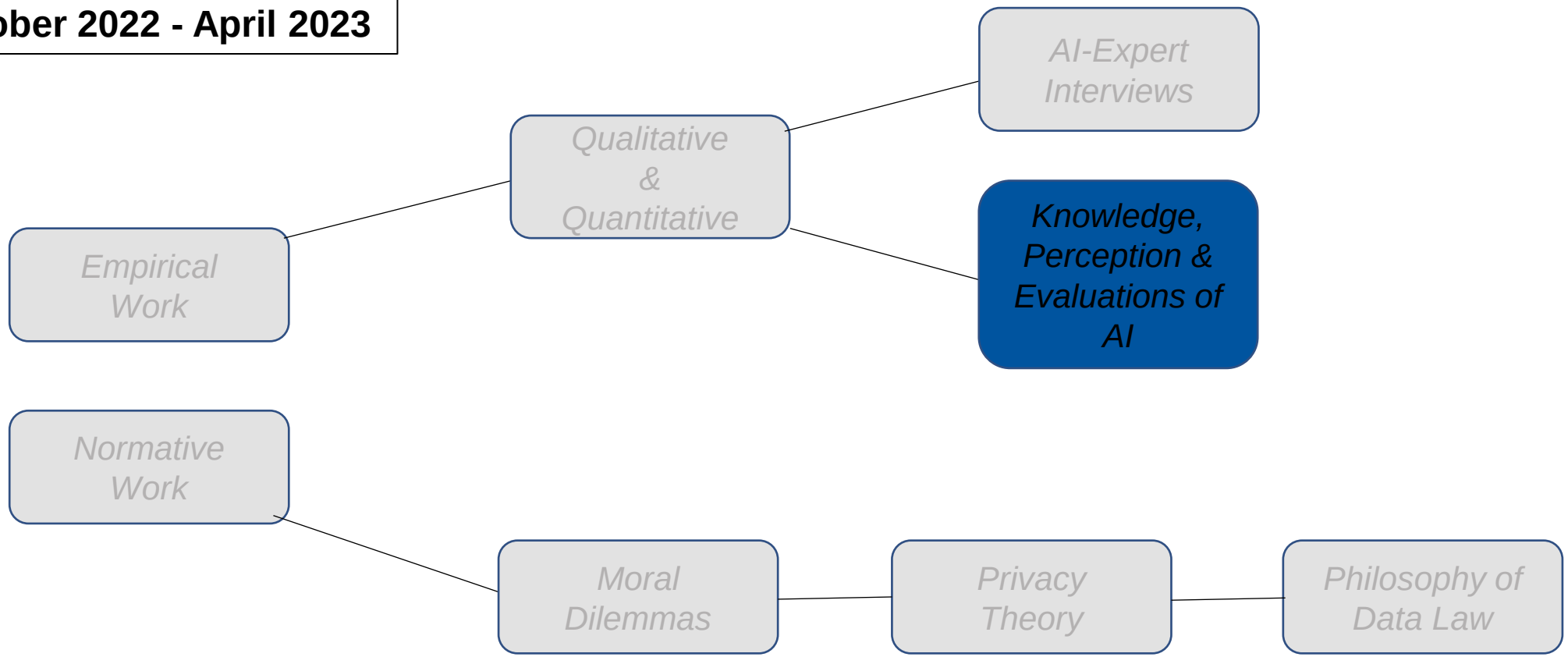

ESR 3. Alexander Hick – Research Questions

Knowledge, Perception & Evaluations of AI

RQ1 How do people **define** AI?

RQ2 What AI do people **know** of?

RQ3 What do people **expect** AI to do?

RQ4 What level of **autonomy** do people allow AI to have?

RQ5 Which variables influence **AI-acceptance**?

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ESR 3. Alexander Hick – Sample Description

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- A total of 131 respondents completed the questionnaire
- After an initial data **116 data sets remained**
- The focus of this study lay on the **German population**
  - Including differently aged male and female participants
    - Between the **ages of 19 and 62 years** (M = 30.86; SD = 10.862)
- The sample was predominately female (57%)
- Participants showed a **moderate affinity for technology interaction** (M = 3.92; SD = .759, from a maximum of 6)

ESR 3. Alexander Hick – Sample Description

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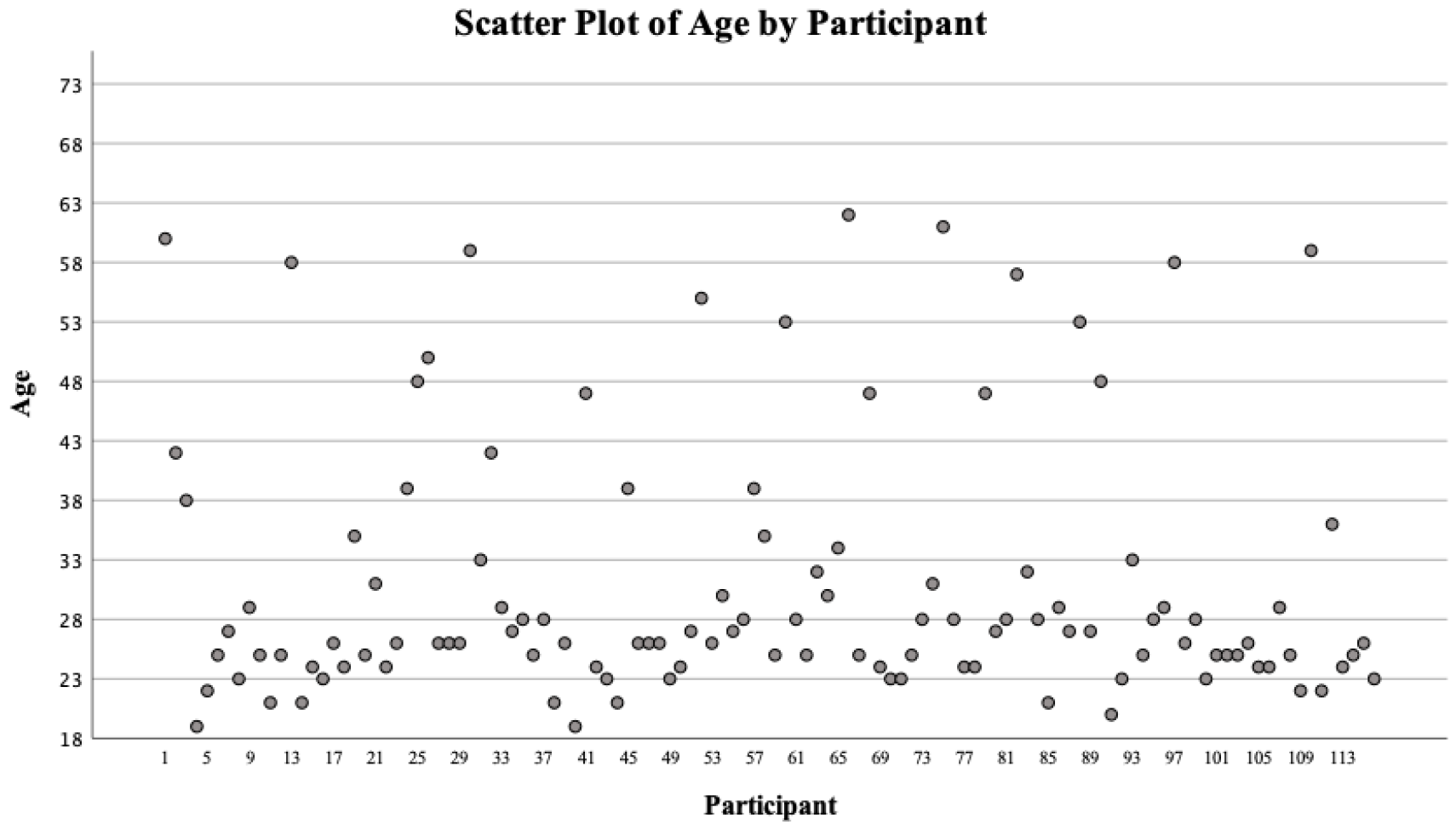

ESR 3. Alexander Hick – Affinity for Technology Interaction*

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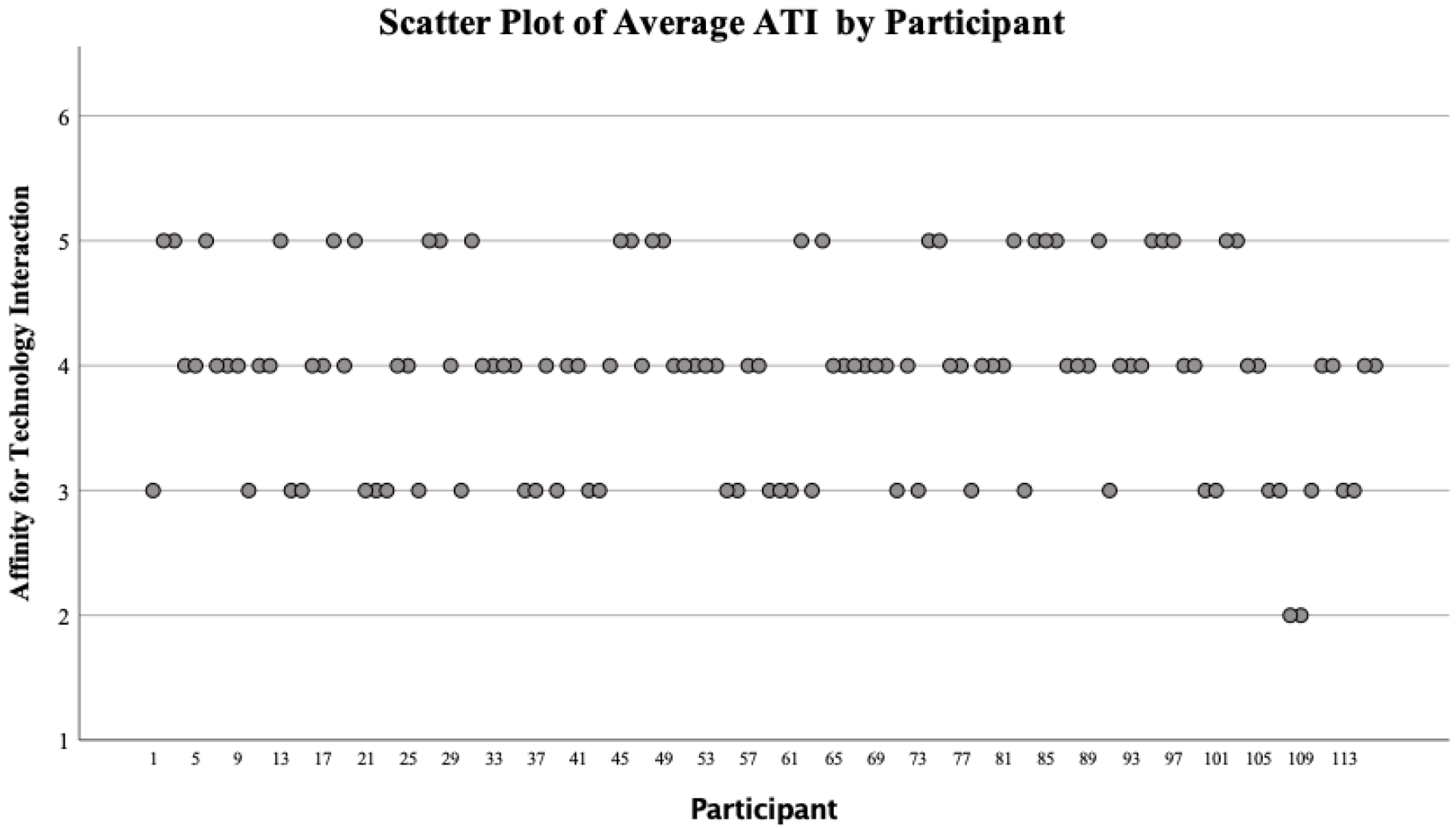

*Thomas Franke, Christiane Attig, and Daniel Wessel. “A personal resource for technology interaction: development and validation of the affinity for technology interaction (ATI) scale”. In: International Journal of Human–Computer Interaction 35.6 (2019), pp. 456–467.

ESR 3. Alexander Hick – AI Definitions

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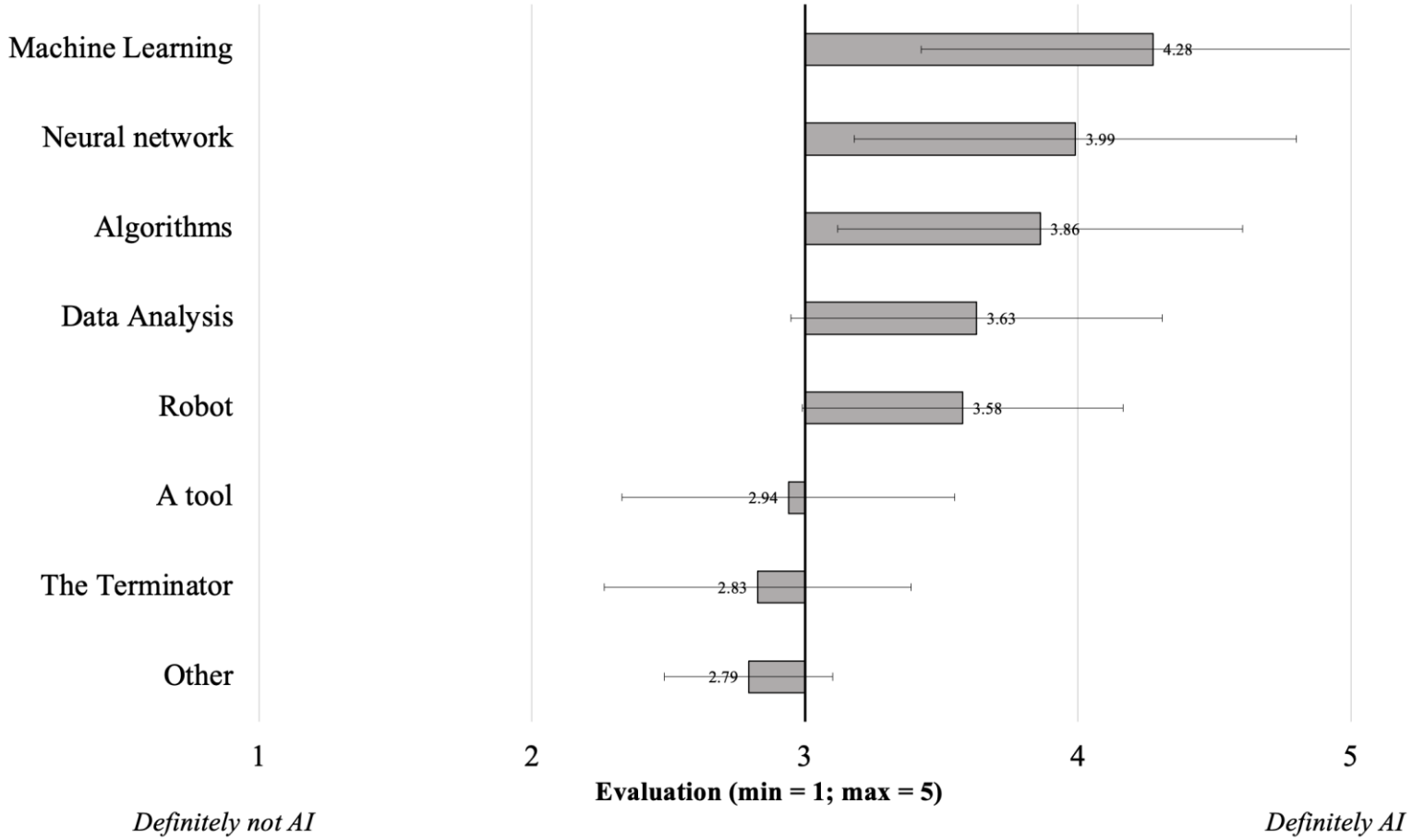
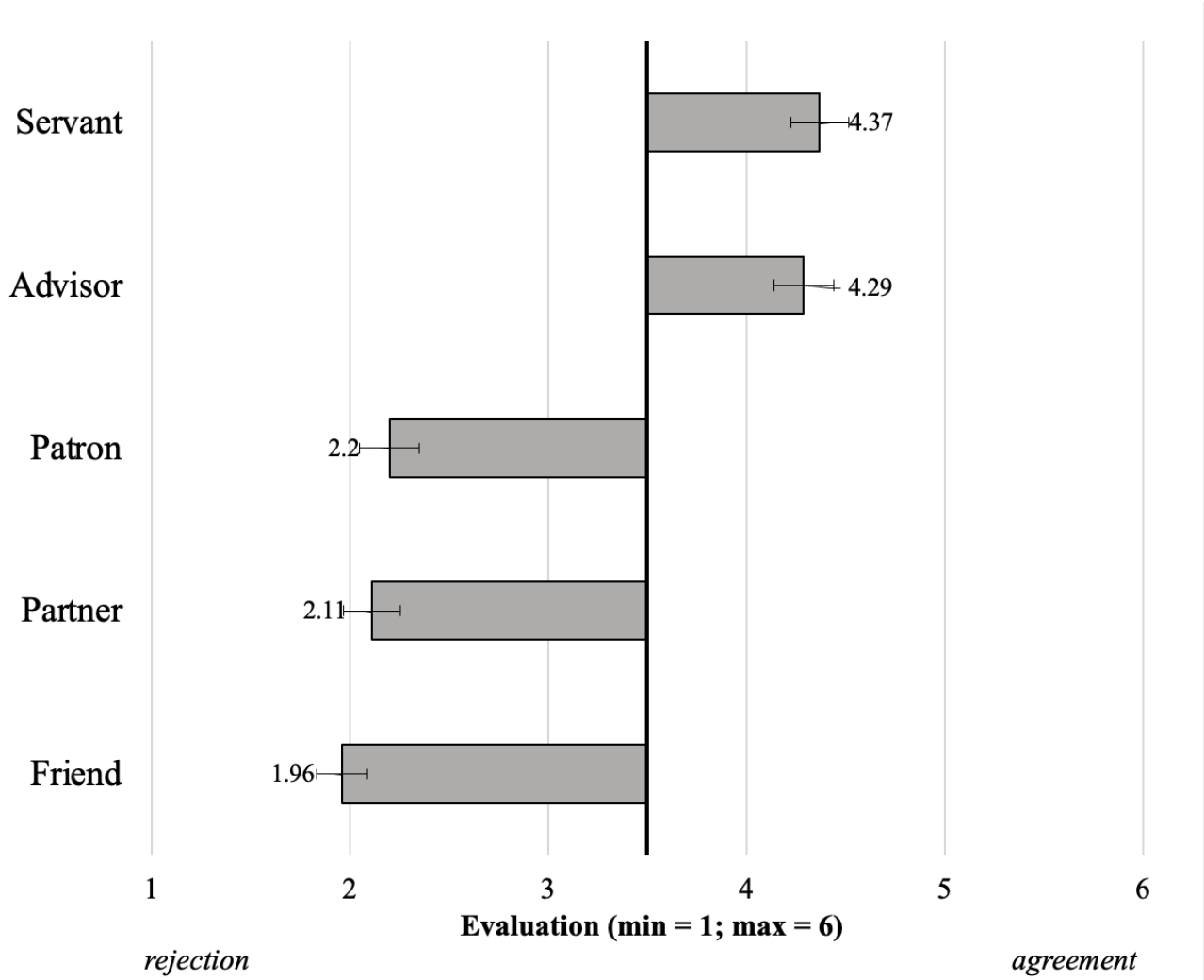


ESR 3. Alexander Hick – Ascribed Roles for AI



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ESR 3. Alexander Hick – AI-Acceptance – TAM extension*

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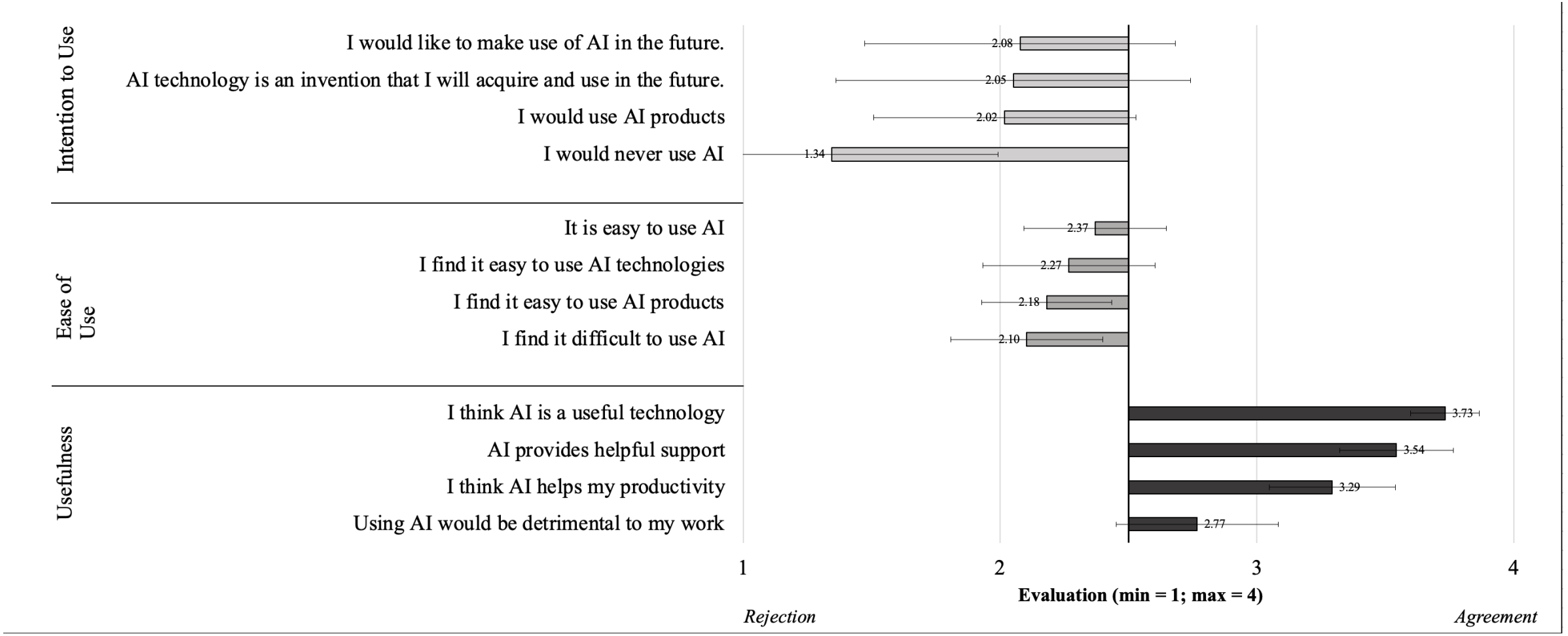

*Viswanath Venkatesh and Fred D. Davis. “A Theoretical Extension of the Technology Ac- ceptance Model: Four Longitudinal Field Studies”. en. In: Management Science 46.2 (Feb. 2000), pp. 186–204. issn: 0025-1909, 1526-5501. doi: 10.1287/mnsc.46.2.186.11926. url: http://pubsonline.informs.org/doi/abs/10.1287/mnsc.46.2.186.11926 (visited on 04/21/2022).

ESR 3. Alexander Hick – Ascribed AI Abilities

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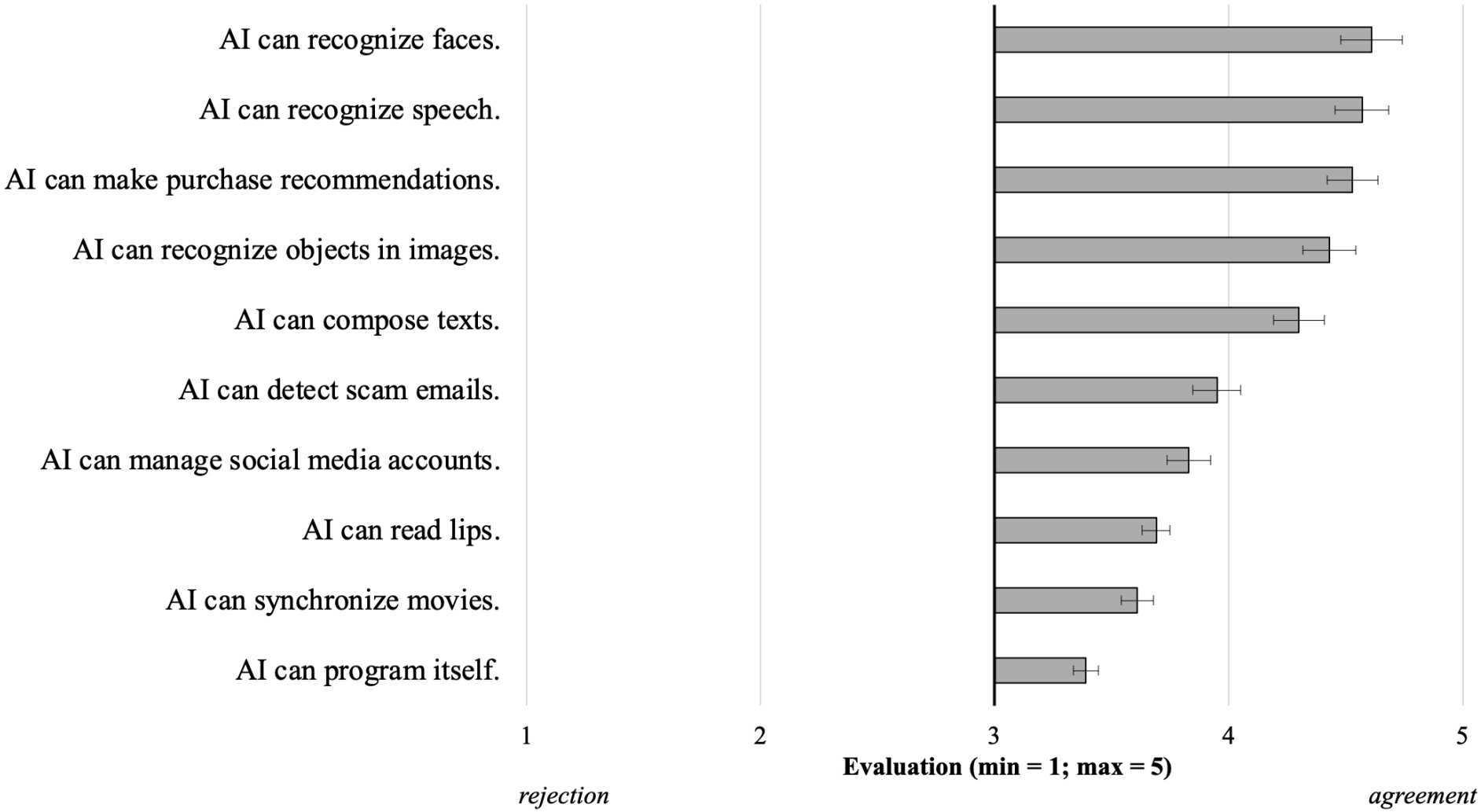

ESR 3. Alexander Hick – Expectations for AI

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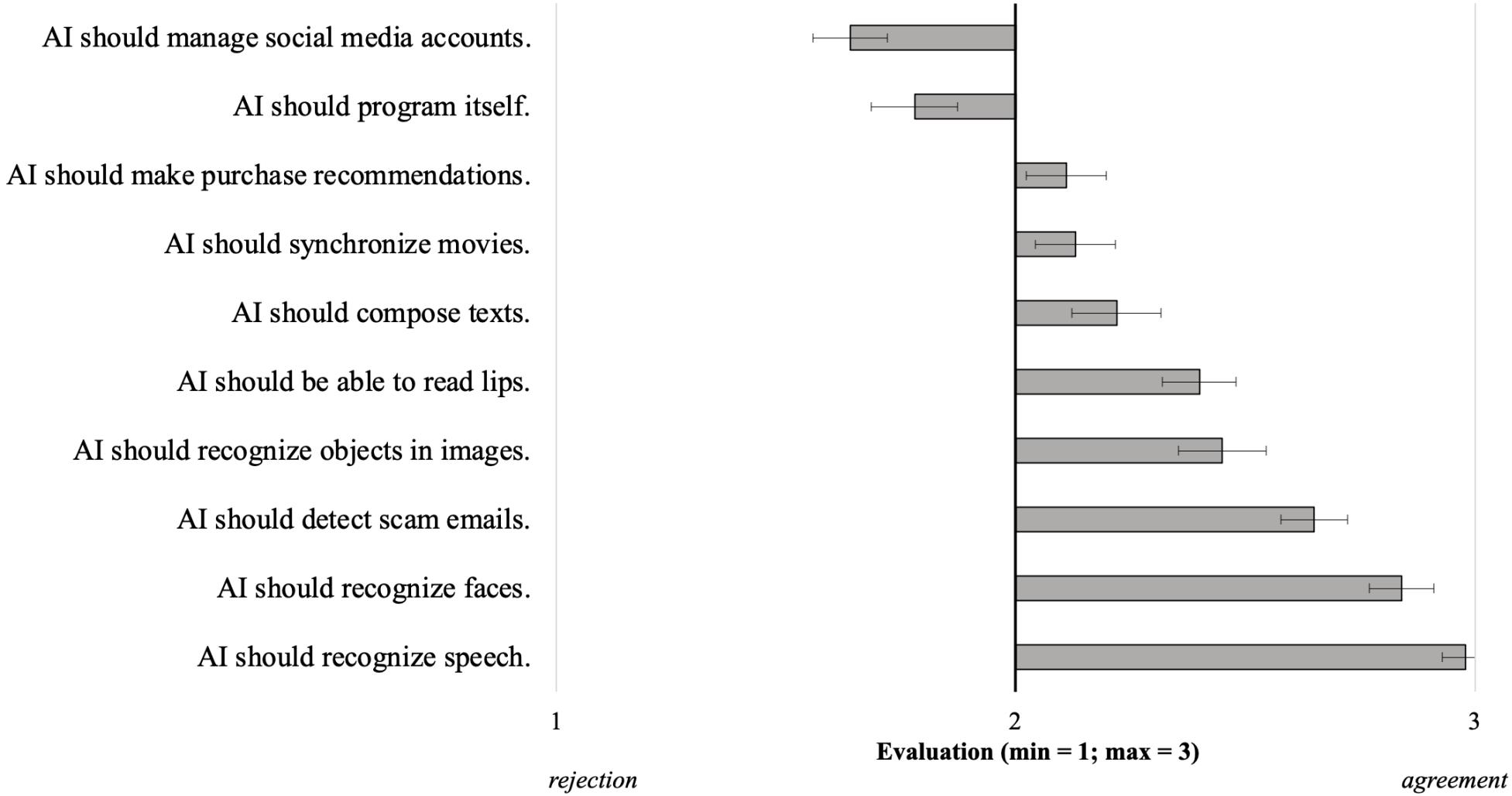

ESR 3. Alexander Hick – Allowed Level of AI-Autonomy

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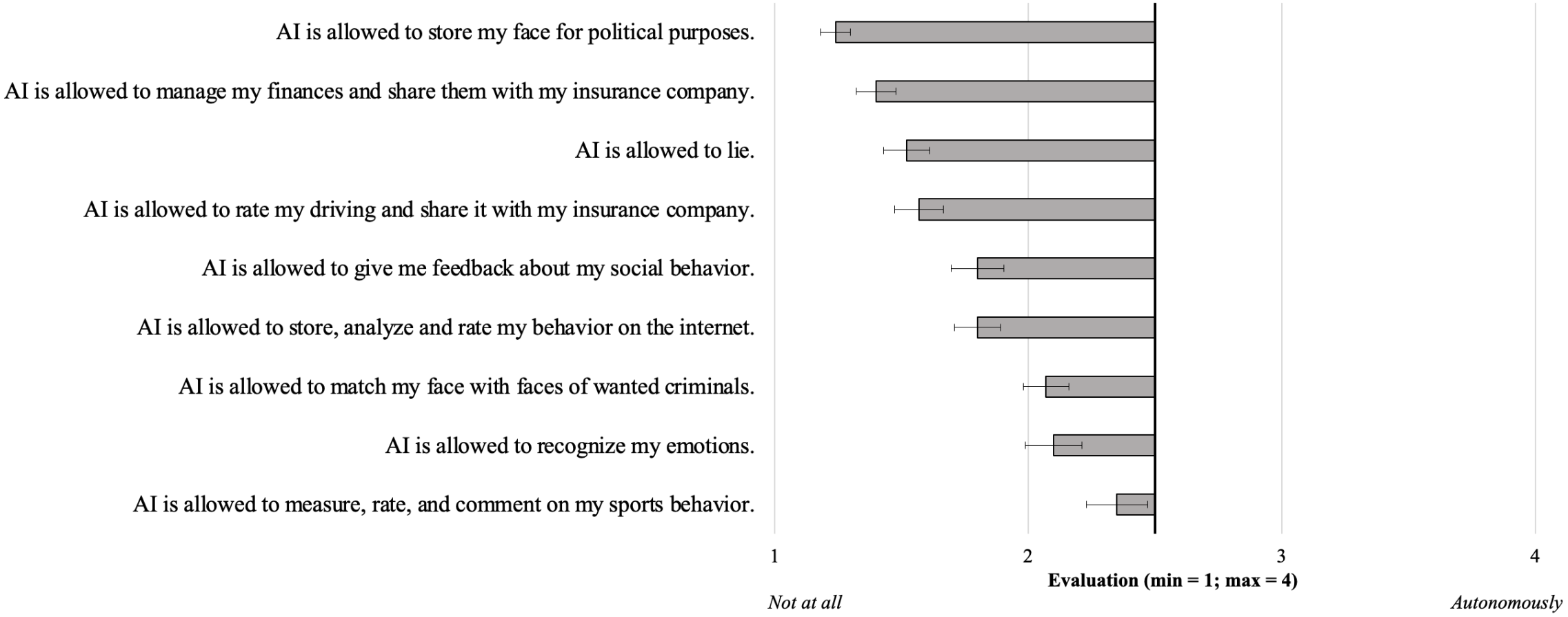
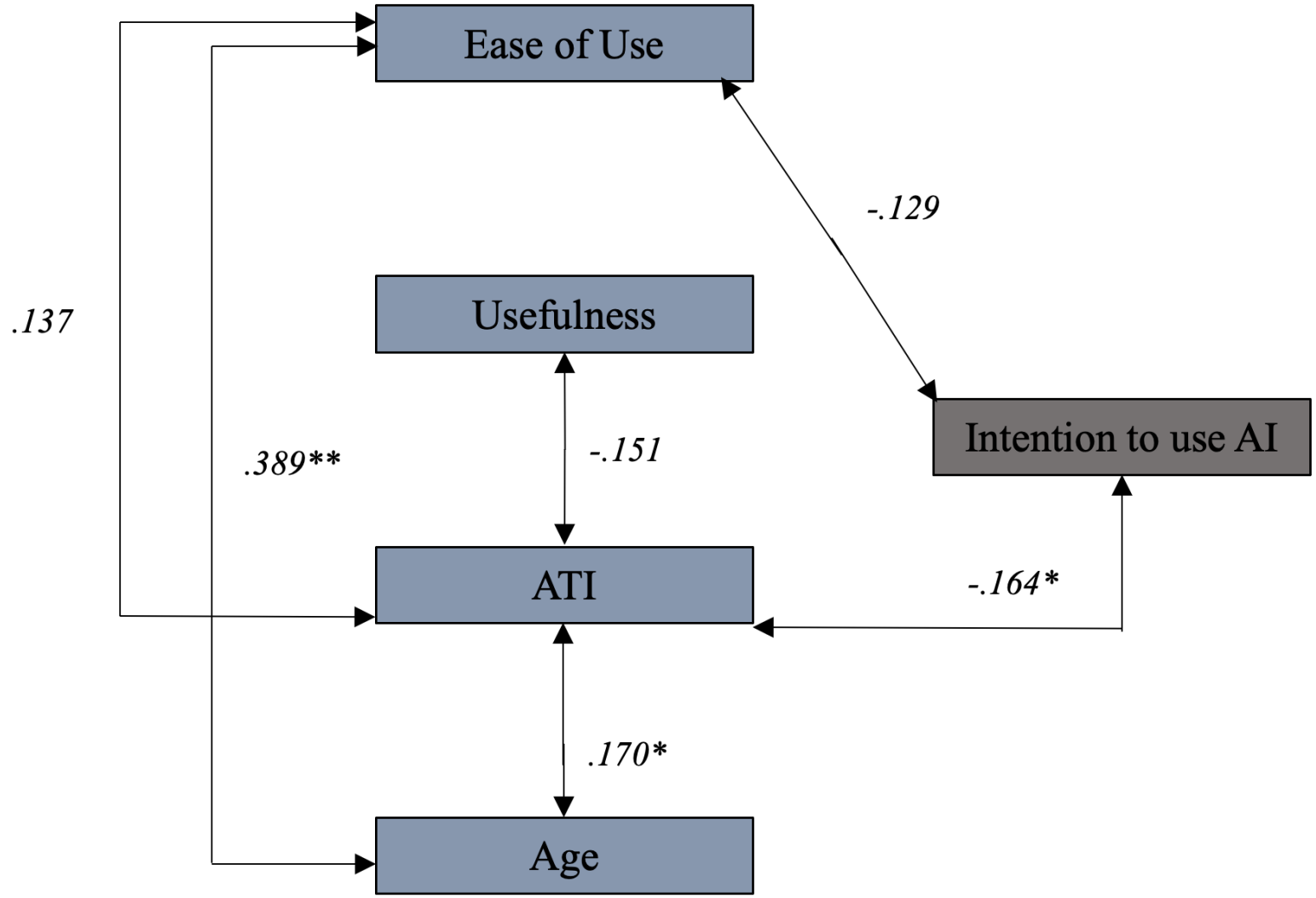


ESR 3. Alexander Hick – Influencing Variables - Correlations



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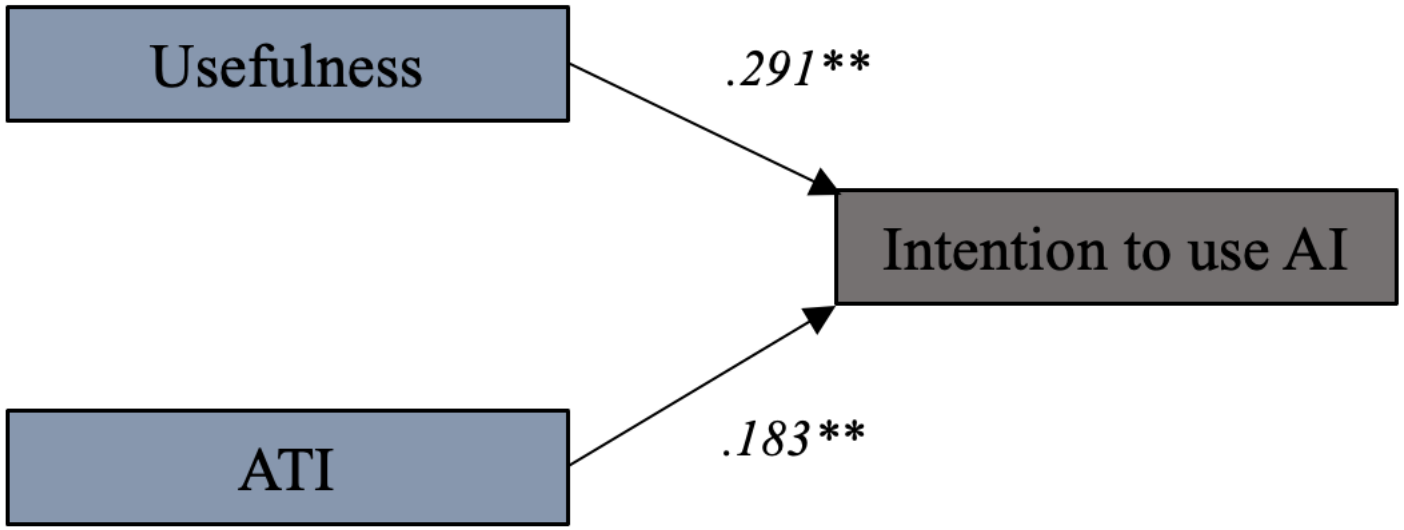

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- **Low intention to use AI despite usefulness**

- **“AI“ should not be** part of social, emotional or very personal processes **without human supervision**.
  - In order to assure the **right** human supervision we **need to agree** on a set of **guidelines and rules**.

- The **knowledge** about AI **is diverse**
  - Different facets of AI get different attention from different people
  - Leads to no consensus about what to expect from AI
  - Difficult to develop communication strategies

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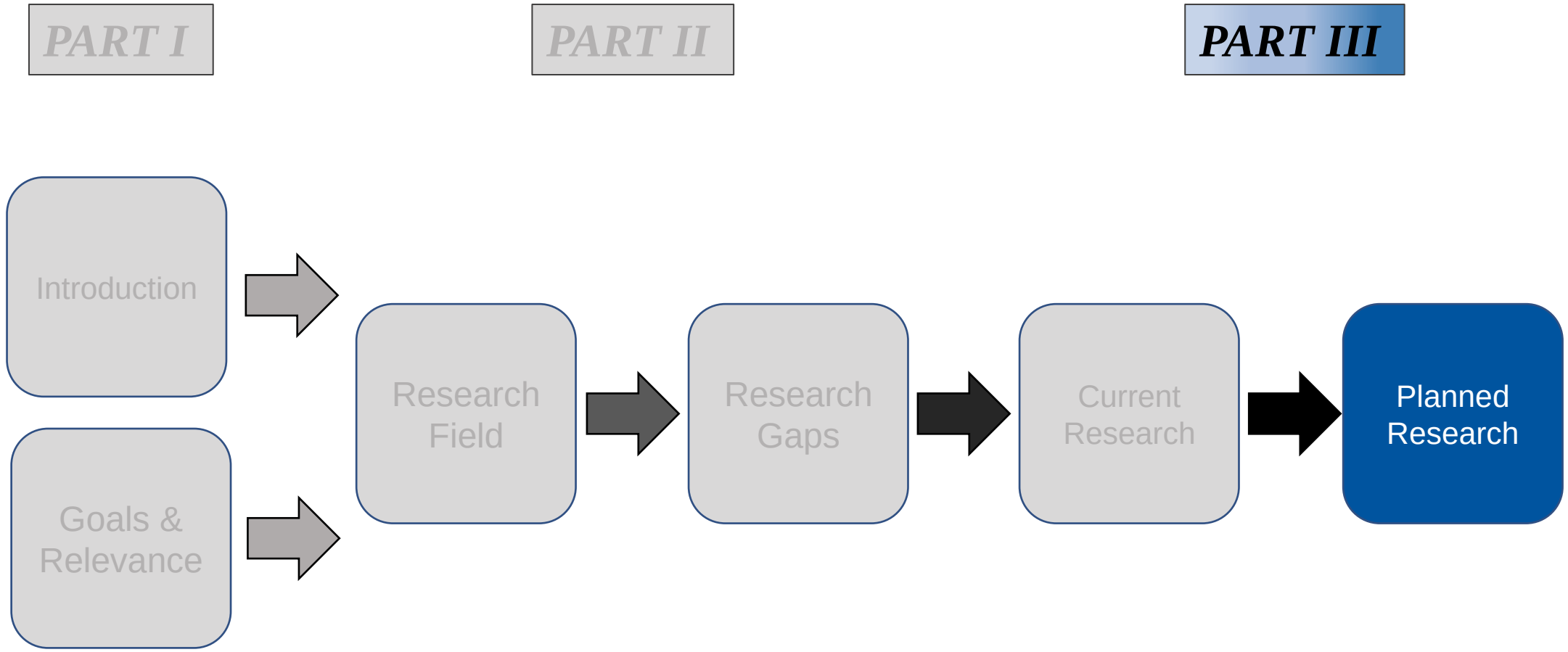

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Planned Research

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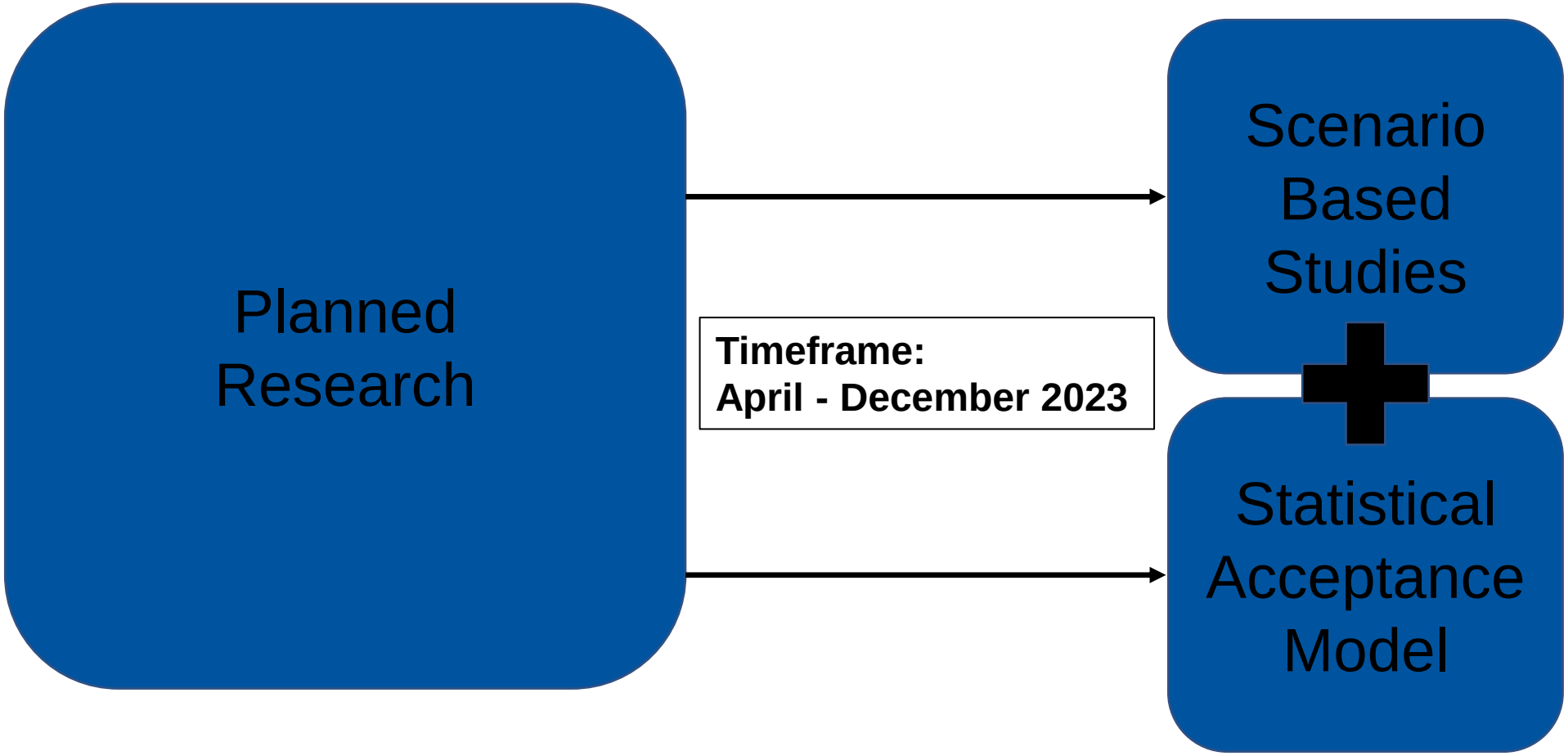

ESR 3. Alexander Hick – Upcoming Research Design (Sneak-Peek)

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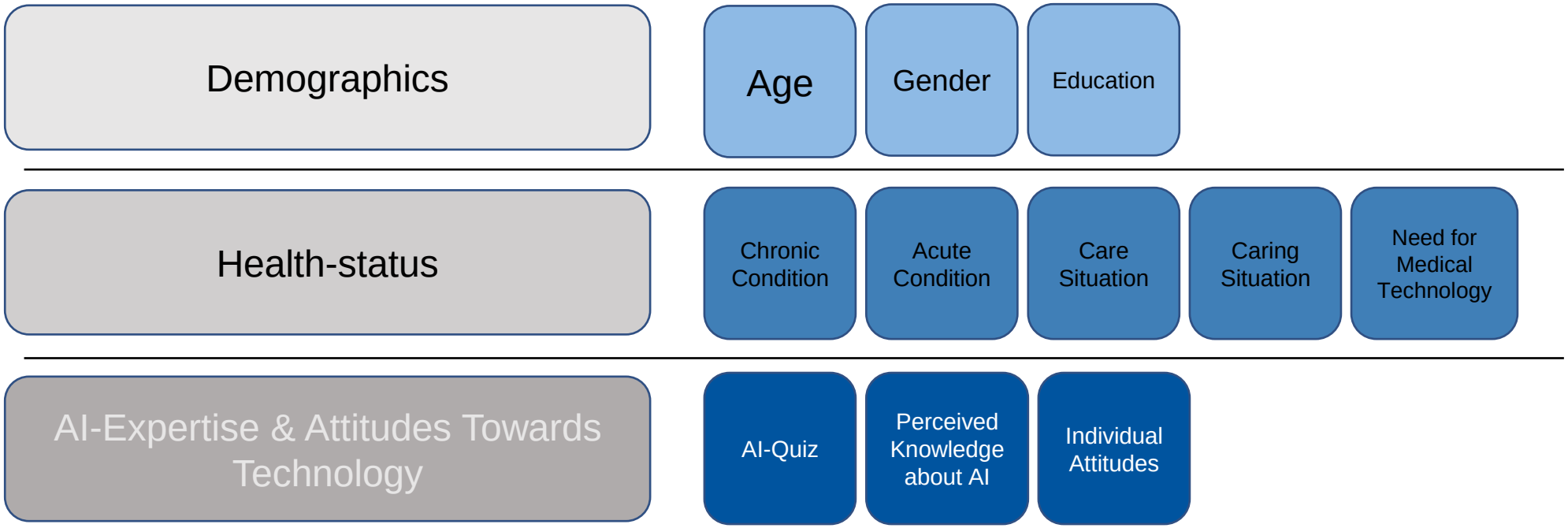

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Research

- Understand the **role of AI in AAL-technology**
- Test the **influencing factors** on **AI-technology acceptance** in a statistical model e.g., SEM

Collaboration

- combine **trust**, **privacy**, and **perceptions of AI** in one study
  - scenario-based approach with experimental design
  - different types of technologies (non-AI vs. AI; camera types)
  - with visuAAL colleagues **Sophia** and **Caterina**
- Address **moral dilemmas** in visual AAL-technology scenarios from **a legal**, **philosophical** and **social** perspective.
  - With visuAAL colleagues **Maks** and **Tamara**

ESR 3. Alexander Hick – Upcoming Dissemination– Overview

Secondment

- **2nd** secondment at ENERVISION (Aachen)
  - Planned start in May 2023
  - Planned contribution to User-interface and UX studies
    - Investigating the role of AI in automation of buildings

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ESR 3. Alexander Hick– Publications

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	2022	2023
Journal		Brauner, P. **Hick, A**., Philipsen, R. & Ziefle, M. (2023). What does the public think about artificial intelligence?—A criticality map to understand bias in the public perception of AI. ***Frontiers in Computer Science***, DOI: 10.5121/ijci.2022.110401
Conference/Book Proceeding	**Hick, A**., Ziefle, M (2022). A qualitative approach to the public perception of AI. In ***ICAIA 2022*** (pp. 1-15). DOI: 10.5121/ijci.2022.110401	Liehner,L.**, Hick, A.,** Biermann, H**.** & Ziefle, M. (2023). Perceptions, attitudes and trust toward artificial intelligence — An assessment of the public opinion. In ***AHFE 2023***.

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Thank you!

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